U.S. Army Corps
of Engineers
Omaha District

Final Oahe Dam/Lake Oahe Master Plan

Missouri River, South Dakota and North Dakota

Design Memorandum MO-224

September 2010

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CENWO-DE

MEMORANDUM FOR Chief, CENWO-OD

SUBJECT: Oahe Dam/Lake Oahe Master Plan with Environmental Assessment, Design Memorandum MO-224

_____ I approve of subject master plan and FONSI.

_____ I approve of subject master plan and FONSI with comments.

_____ I do not approve of subject master plan and FONSI.

Encl

ROBERT J. RUCH
Colonel, EN
Commanding

CENWO-OD-TN

MEMORANDUM FOR CENWO-DE

SUBJECT: Oahe Dam/Lake Oahe Master Plan with Environmental Assessment, Design Memorandum MO-224

1. The Oahe Dam/Lake Oahe Master Plan and Finding of No Significant Impact (FONSI) are submitted for approval. The format and content of the Master Plan were prepared in accordance with ER 1130-2-550. A quality assurance/quality control checklist is attached.

2. The Assistant Secretary of the Army for Civil Works, the Honorable John Paul Woodley, directed the Omaha District to identify and provide strategies/solutions for drought-related issues as well as flood events that would extend into the exclusive flood zone of Lake Oahe. The Omaha District developed a High Pool/Low Pool Management Issues and Strategies document that addressed land management issues during these times. This is a unique approach to the master planning process because, historically, inundated lands are not considered in a master plan. The High Pool/Low Pool management document is included in Chapter 3 of the master plan.

3. Numerous Federal, State and Tribal agency meetings as well as public meetings were held throughout the development of the master plan. Native American Programmatic Agreement requirements have been followed throughout the entire master planning process.

4. All National Environmental Protection Act (NEPA) guidelines have been followed. An Environmental Assessment has been prepared for this master plan. A FONSI (NEPA requirement) is enclosed for signature.

5. The enclosed master plan and FONSI are recommended for approval.

Encl
As

KATHRYN M. SCHENK
Chief, Operations Division

CF (w/o encl):
CENWO-OD-OA

Final
Oahe Dam/Lake Oahe Master Plan
Missouri River, South Dakota and North Dakota

Design Memorandum MO-224

September 2010

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TABLE OF CONTENTS

PERTINENT DATA xi

PROJECT DESIGN MEMORANDUMS xiv

ACRONYMS AND ABBREVIATIONS xxiv

CHAPTER 1 - INTRODUCTION **1-1**
PROJECT DESCRIPTION 1-2
PROJECT AUTHORIZATION 1-3
PROJECT PURPOSES 1-3
Flood Control 1-3
Navigation 1-3
Hydropower 1-6
Fish and Wildlife 1-6
Recreation 1-6
Irrigation 1-6
Municipal and Industrial Water Supply 1-6
Water Quality 1-6
PURPOSE AND SCOPE OF THE MASTER PLAN 1-7
Purpose 1-7
Scope 1-8
PROJECT-WIDE RESOURCE OBJECTIVES 1-9

CHAPTER 2 - FACTORS INFLUENCING RESOURCE MANAGEMENT AND DEVELOPMENT **2-1**
DESCRIPTION OF THE RESERVOIR 2-1
RESERVOIR REGULATION 2-2
Effects of Operations on Recreation 2-5
Effects of Operations on Fish and Wildlife 2-6
HYDROLOGY AND GROUNDWATER 2-6
Hydrology 2-6
Groundwater 2-8
ICE AFFECTED FLOWS 2-8
SEDIMENTATION 2-9
Watershed Sediments 2-10
Littoral Drift 2-10
Shoreline Erosion 2-11
SURFACE WATER QUALITY 2-11
Federal Clean Water Act 2-11
Corps Water Quality Management Program 2-12
General Water Quality Concerns at the Missouri River Main Stem Projects 2-12
Designated Water Quality-Dependent Beneficial Uses 2-14
Management of Lake Oahe as a “Two-Story” Fishery 2-14
Water Quality Monitoring at the Oahe Project 2-15
Water Quality Conditions Monitored at the Oahe Project 2-16
Future Actions - Water Quality Monitoring and Management at the Oahe Project 2-18
Water Quality Management 2-18
Project Water Quality Management Planning 2-20
ACCESSIBILITY 2-21

Road Access 2-21
Rail Access 2-22
Air Access 2-22
Lake Navigation 2-22
CLIMATE 2-23
Temperature 2-23
Precipitation and Evaporation 2-24
Wind 2-25
TOPOGRAPHY, GEOLOGY, AND SOILS 2-25
Topography 2-25
Geology 2-27
Soils 2-28
LAND USE 2-31
BORROW AREAS AND UTILITIES 2-33
VEGETATION RESOURCES 2-33
Wetlands 2-34
Bottomland Hardwoods 2-34
Shorelines 2-35
Woody Draws 2-35
Grasslands 2-37
Agricultural Lands 2-38
FISH AND WILDLIFE RESOURCES 2-38
Fisheries 2-38
Waterfowl and Other Water-Dependant Birds 2-49
Other Birds 2-41
Mammals 2-42
Reptiles and Amphibians 2-43
Aquatic Nuisance Species 2-43
RARE AND ENDANGERED SPECIES AND COMMUNITIES 2-45
Federally Listed Species 2-46
State Listed Species 2-48
Other Species and Communities 2-49
Biological Opinion 2-50
VISUAL QUALITIES 2-50
MINERAL AND TIMBER RESOURCES 2-51
PALEONTOLOGY 2-51
CULTURAL RESOURCES 2-53
Prehistoric and Historic Periods 2-53
Cultural Resource Management 2-56
Protection of Cultural Resources 2-56
The Programmatic Agreement and Its Integration into the Master Plan 2-57
INTERPRETATION 2-59
DEMOGRAPHICS 2-59
Historic Perspective 2-59
Current Population Trends 2-61
Demographic Effects on Visitation 2-67
ECONOMIC CHARACTERISTICS 2-70
Income and Employment 2-70
Tourist Expenditures 2-73
Tax Revenue 2-75
Economic Impacts 2-77

RECREATION 2-77
Recreation Facilities 2-77
Recreation Activities and Needs 2-78
VISITATION PROFILE - TRENDS AND DEMANDS 2-82
Project Visitation 2-82
Visitation Surveys 2-83
Visitor Distribution 2-84
Carrying Capacity 2-86
Activity Mix 2-86
Recreation Demand 2-87
RELATED RECREATIONAL, HISTORICAL, AND CULTURAL AREAS 2-87
REAL ESTATE 2-89
Land Acquisition History 2-89
Title VI 2-90
Current Landholdings 2-91
Executive Order Surveys 2-92
Encroachments 2-92
Boundary Monumentation and Fencing 2-92
Outgrants 2-92
Flowage Easements 2-93
Grazing Rights within the CRST and SRST Reservations 2-93
PERTINENT PUBLIC LAWS 2-94
Civil Authority 2-94
Corps Authority 2-94
Federal Authority 2-94
Cooperative Agreements 2-109
MANAGEMENT PLANS 2-110
Project/District Management Plans 2-110
SUMMARY 2-112

CHAPTER 3 - SPECIAL ISSUES 3-1
TRIBAL JURISDICTION 3-1
NOXIOUS WEEDS 3-1
HIGH POOL AND LOW POOL MANAGEMENT ISSUES AND STRATEGIES 3-2
Pool Operating Conditions 3-3
Definition of Issues 3-4
Elevation Zones - Issues and Opportunities 3-11
Management Strategies 3-25
Recommendations 3-28

CHAPTER 4 - PUBLIC INVOLVEMENT AND COORDINATION 4-1

CHAPTER 5 - LAND ALLOCATION, LAND CLASSIFICATION, AND RESOURCE OBJECTIVES 5-1
LAND ALLOCATION 5-1
LAND CLASSIFICATION 5-1
RESOURCE OBJECTIVES FOR SPECIFIC LAND CLASSIFICATIONS 5-2
Project Operations Lands 5-2
Recreation Lands 5-3
Mitigation Lands 5-4
Environmentally Sensitive Areas 5-4

Multiple Resource Management Lands 5-5

CHAPTER 6 - RESOURCE PLAN 6-1
INTRODUCTION 6-1
OAHE PROJECT 6-1
MANAGEMENT UNITS 6-4
1. Dam Embankment, Powerhouse, Administration Building, Maintenance Yard, Oahe Chapel, Overlooks, and Visitor Center 6-7
2. East Shore Area 6-10
3. East Shore Recreation Area 6-12
4. Government Bay Area 6-14
5. Brockhouse Area 6-16
6. Peoria Flats Game Management Area 6-18
7. Nystrom's Bay Area 6-20
8. Spring Creek Fisheries Management Area 6-22
9. Spring Creek Wildlife Area 6-24
10. Sheehan Area 6-26
11. Plum Creek Area 6-28
12. Koenig Wildlife Area 6-30
13. Mail Shack Creek Area 6-32
14. Little Bend Natural Area 6-34
15. Bakers Gulch Area 6-36
16. Sunset Wildlife Area 6-38
17. Sutton Game Production Area 6-40
18. Eidam Area 6-42
19. Harer Area 6-44
20. Whitlocks Bay Wildlife Area 6-46
21. Swede's Draw Area 6-48
22. Brown's Creek Area 6-50
23. Hauck Ranch Area 6-52
24. Pero Creek Area 6-54
25. Two Forks Area 6-56
26. New Evarts Area 6-57
27. South Blue Blanket Area 6-59
28. Blue Blanket Creek Game Management Area 6-61
29. Keszler Area 6-63
30. Natural Resources Office 6-64
31. Moose Flats Area 6-65
32. Water Plant Bay Area 6-67
33. Rorgo Bay Area 6-69
34. Locke Creek Area 6-71
35. Helb Area 6-73
36. Ritter Bay Area 6-75
37. Pollock Bay Wildlife Area 6-76
38. Pocasse Wildlife Area 6-78
39. Lake Pocasse Dam and Control Structure 6-80
40. Point La Grace Area 6-81
41. Meyers Bay Area 6-83
42. State Line Wildlife Area 6-85
43. Moser Bay Area 6-87
44. Langelier Bay Recreation Area 6-89

45. New Haven Area 6-91
46. Cattail Bay Recreation Area 6-93
47. Winona Island Natural Area 6-95
48. Rivery Wildlife Area 6-97
49. South Beaver Creek Recreation Area 6-99
50. Beaver Creek Wildlife Area 6-101
51. Beaver Creek Recreation Area 6-103
52. Horsehead Creek Area 6-106
53. Badger Bay Recreation Area 6-108
54. Hazelton Recreation Area 6-110
55. Carlson Bottom 6-113
56. MacLean/Kimball Bottoms 6-115
57. MacLean Bottom Recreation Area 6-118
58. Kimball Bottom Recreation Area 6-120
59. Apple Creek Wildlife Area 6-123
60. Sibley Nature Park 6-125
61. General Sibley Park 6-127
62. Schmidt/Graner Bottoms 6-130
63. Little Heart Recreation Area 6-132
64 Graner Park Recreation Area 6-134
65. Huff Village Area 6-136
66. Eckroth Bottom Area 6-138
67. Fort Rice Recreation Area 6-140
68. Cannonball North Area 6-142
69. Cannonball South Area 6-144
70. Walker Bottom Recreation Area 6-146
71. Porcupine Creek Area 6-148
72. Fort Yates Recreation Area 6-150
73. Fort Yates Flood Protection Project 6-153
74. Fort Yates Municipal Park 6-155
75. One Mile Bay 6-157
76. Four Mile Bay Wildlife Area 6-158
77. Four Mile Bay Lake Access 6-160
78. Fire Heart Creek Area 6-162
79. State Line Bay Wildlife Area 6-164
80. Kenel Flats Area 6-166
81. Leavenworth Creek Area 6-169
82. Blackhawk Creek Lake Access 6-171
83. Oak Creek Area 6-173
84. Singing Bridge Lake Access 6-175
85. Grand River Wildlife Area 6-177
86. Grand River Recreation Area 6-179
87. Claymore Creek Area 6-181
88. Indian Memorial Recreation Area 6-183
89. Deadman's Creek Area 6-186
90. Little Bear Creek Area 6-188
91. Molstad Bay Area 6-190
92. Moreau River Area 6-192
93. Bender Bay Lake Access 6-194
94. Swift Bird Creek Area 6-196
95. Blackfoot Area 6-198

96. Old Agency Park 6-200
97. Forest City Recreation Area 6-202
98. Stove Creek Area 6-204
99. Many Creeks Area 6-206
100. Rousseau Recreation Area 6-208
101. North Cheyenne Area 6-210
102. Aeber Creek Lake Access 6-212
103. South Cheyenne Area 6-214
104. Sansarc Creek Area 6-216
105. Agency Creek Area 6-218
106. Twin Bays Area 6-220
107. Emergency Spillway Area 6-222
108. West Shore Recreation Area 6-224
109. West Shore Wildlife Area 6-227
110. Downstream Recreation Area 6-229

CHAPTER 7 - ENVIRONMENTAL OPERATING PRINCIPLES 7-1

CHAPTER 8 - CONCLUSIONS 8-1

CHAPTER 9 - RECOMMENDATION 9-1

CHAPTER 10 - REFERENCES 10-1

LIST OF TABLES

Table 2-1 Missouri River Main Stem Reservoirs 2-2
Table 2-2 Ambient Water Quality Monitoring Location at the Oahe Project 2-16
Table 2-3 Trophic Condition Criteria 2-17
Table 2-4 Priority Water Quality management Issues within the Omaha District 2-19
Table 2-5 Schedule for Water Quality Management Planning Activities for the Main Stem System Projects 2-21
Table 2-6 Mean Maximum, Monthly, and Minimum Temperature for Bismarck and Pierre 2-23
Table 2-7 Mean Precipitation Levels for Bismarck and Pierre 2-24
Table 2-8 Geologic Time Scale and Corresponding Rock Formations 2-28
Table 2-9 Soil Associations 2-29
Table 2-10 Top Five North Dakota Agricultural Commodities, 2005 2-32
Table 2-11 Top Five South Dakota Agricultural Commodities, 2005 2-32
Table 2-12 Numbers of Coldwater Fish Stocked by SDGFP in Lake Oahe, 1982-2005 2-39
Table 2-13 Numbers of Fish Stocked by NDGF in Lake Oahe, 1957-1993 2-40
Table 2-14 Threatened and Endangered Species that Occur on Oahe Project Lands 2-46
Table 2-15 Cultural Resources at Main Stem Projects 2-54
Table 2-16 Outdoor Recreation Participation by Age Group, North Dakota Residents 2-68
Table 2-17 Outdoor Recreation Participation by Age Group,

South Dakota Residents 2-69
Table 2-18 Income and Employment Data, Upper Oahe Area 2-71
Table 2-19 Percent of Civilian Employment by Industry, Urban Burleigh County, ND and Rural Sioux County, ND, 2000 2-72
Table 2-20 Income and Employment Data, Lower Oahe Area 2-72
Table 2-21 Percent of Civilian Employment by Industry, Urban Hughes County, SD and Rural Ziebach County, SD 2-73
Table 2-22 Percent of Civilian Employment by Industry, North Dakota and South Dakota 2-74
Table 2-23 Annual Visitation at the Oahe Project 2-83
Table 2-24 CY 2000 Main Stem Visitation 2-83
Table 2-25 2006 Visitation to Corps-Owned Lake Oahe Recreation Areas 2-85
Table 2-26 Lake Oahe Activity Mix. 2005 2-87
Table 2-27 Attractions, Events, and Recreation Areas within a 60-Minute Drive of Lake Oahe 2-88
Table 2-28 Government-Owned Lands at the Oahe Project South Dakota Counties 2-91
Table 3-1 Lake Oahe Boat Ramps 3-6
Table 3-2 Acres of Exposed Land by Low Pool Zone 3-10
Table 3-3 Closed Ramps - High Pool Zone 1 3-14
Table 3-4 Additional Closed Ramps - High Pool Zone 2 3-15
Table 3-5 Ramp Affected at Normal Operation Conditions 3-15
Table 3-6 Closed Ramps - Low Pool Elevation Zone 1 3-20
Table 3-7 New Open Ramps - Low Pool Elevation Zone 1 3-20
Table 3-8 Closed Ramps - Low Pool Elevation Zone 2 3-21
Table 3-9 New Open Ramps - Low Pool Elevation Zone 2 3-21
Table 3-10 Closed Ramps - Low Pool Elevation Zone 3 3-22
Table 3-11 Closed Ramps - Low Pool Elevation Zone 4 3-23

LIST OF FIGURES

Figure 1-1 Omaha District Civil Works Boundary Emphasizing the Missouri River Main Stem System of Six Dams and Reservoirs 1-4
Figure 1-2 Location Map for the Oahe Project 1-5
Figure 2-1 Oahe Storage Zones 2-3
Figure 2-2 Lake Oahe Pool Elevations 2-4
Figure 2-3 Lake Oahe Drainage Areas 2-7
Figure 2-4 Physiographic Divisions: North Dakota 2-26
Figure 2-5 Physiographic Divisions: South Dakota 2-26
Figure 2-6 Lake Oahe Demographic Area 2-62
Figure 2-7 Population in Upper Oahe Counties from 1970-2000 2-64
Figure 2-8 Population in Lower Oahe Counties from 1970-2000 2-66
Figure 2-9 Population in North Dakota and South Dakota from 1970-2000 2-67
Figure 3-1 High Pool Elevation Zones 3-12
Figure 3-2 Low Pool Elevation Zones 3-17

LIST OF APPENDIXES

A - RECREATION AREAS TRANSFERRED UNDER TITLE VI
B - LISTING OF SPECIES
C - ENVIRONMENTAL ASSESSMENT
D – CULTURAL RESOURCES DEFINITIONS
E – PUBLIC COMMENTS AND RESPONSES

LIST OF PLATES
LAND CLASSIFICATION PLATES 1-23

PERTINENT DATA

GENERAL

Location of Dam	6 miles north of Pierre, South Dakota, at Missouri River miles 1072.3 (1960 mileage)
Operating and Managing Agency	U.S. Army Corps of Engineers
Purposes	Flood control, hydroelectric power, navigation, irrigation, fish and wildlife enhancement, municipal water supply, improvement of water quality, and recreation
Authorization	Flood Control Act of 22 December 1944, as amended (Public Law 78-534)
Year Construction Started	1948
Year Dam Place in Operation	1962
Project Cost	$347 million (1999 dollars)

DAM AND EMBANKMENT

Type	Rolled earth fill and shale berms
Fill Quantity	92,000,000 cubic yards
Concrete (all structures)	1,045,000 cubic yards
Foundation Material	Pierre shale
Height	245 feet
Length of Top (elevation 1660 feet m.s.l.)	9,300 feet (excluding Spillway)
Width of Top	60 feet
Width of Base (maximum)	3,500 feet

OUTLET

Location	Right bank
Number and Type	6 - concrete lined tunnels
Size	19.75 feet diameter upstream; 18.25 feet diameter downstream

Length	3,496 to 3,659 feet
Type and Size Gates	Bulkhead, 13 x 22 feet
Tunnels Discharge (elevation 1620 feet m.s.l.)	111,000 c.f.s.
Intake Invert Elevation	1425 feet m.s.l.

POWERPLANT

Powerplant	Left bank
Average Gross Head Available	174 feet
Number and Size of Conduits	7 - 24 feet diameter
Number and Size of Surge Tanks	14 tanks - 70 feet diameter x 145 feet height
Number, Type, and Speed of Turbines	7 - Francis, vertical shaft, single runner; 100 rpm
Discharge Capacity at Rated Head	Full gate 185 feet net head; 54,000 c.f.s.
Total Plant Capacity	786,030 kW
Dependable Capacity	534,000 kW
Average Annual Energy Production	2,867 million kW

SPILLWAY

Location	Remote site on west/right bank
Number, Size and Type Gates	8 - 50 x 23 feet tainter
Crest Elevation	1596.5 feet m.s.l.
Width	456 feet

RESERVOIR

Drainage Area Upstream from Oahe Dam	243,490 square miles
Lake Oahe Drainage Area	62,090 square miles

Length (elevation 1617 feet m.s.l.)	231 miles
Shoreline (elevation 1607.5 feet m.s.l.)	2,250 miles
Average Width	1.7 miles
Average Daily Total Water Inflow	26,400 c.f.s.
Average Daily Sediment Inflow	75,000 tons
Storage Capacity	23,137,000 acre-feet
Maximum Depth	200 feet
Maximum Operating Pool Elevation and Area	1620 feet m.s.l.; 374,000 acres
Maximum Normal Operating Pool Elevation and Area	1617 feet m.s.l.; 360,000 acres
Minimum Normal Operating Pool Elevation and Area	1607.5 feet m.s.l.; 312,000 acres
Minimum Operating Pool Elevation and Area	1540 feet m.s.l.; 117,000 acres
Exclusive Flood Control Pool Elevation and Storage Area	1617-1620 feet m.s.l.; 1,102,000 acre-feet

CORPS OF ENGINEERS REPORTS, OAHE PROJECT
PROJECT DESIGN MEMORANDUMS

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-1	Report on Selection of Site	Sep 47	
MO-2	Oahe and Fort Randall Reservoir Spillway Design Flood	Jul 47	
MO-3	DPR (main Body)	Feb 48	Apr 48
MO-3-1	DPR, Volume I (Appendix 1-5)	Feb 48	
MO-3-2	DPR, Volume II (Appendix 7-17)	Feb 48	Apr 48
MO-4	Joint Minutes of Meeting on Oahe Power Installation, held in Omaha District, 19 Feb 48	Feb 48 Rev Mar 48	Apr 48
MO-5	Oahe and Fort Randall Reservoir Appendix 1, Hydrology and General Hydraulics Spillway Design Flood, Supplement, Supplemental Report	Mar 48	Jun 48
MO-6	AD, Housing Facilities at Pierre Airfield near Pierre, South Dakota	Jul 48	Sep 48
MO-7	DPR Supplement, Appendix 10, construction Facilities		
MO-8	DPR Supplement Report on Outlet Works	Jan 50	Mar 50
MO-9	AD, Oahe Access RR, Pierre, South Dakota	Jan 50	Jan 50
MO-10	AD, Earthwork, Stage I, Oahe Reservoir with Appendix I	Jan 50	Mar 50
MO-11	AD, Buildings and Facilities, Pierre, Stage II	Mar 50	Not approved
MO-12	AD, Housing and Facilities, Pierre, Stage I	Apr 49	May 49
MO-13	AD, Oahe, Seeding and Planting, Stage I, Oahe Housing Area, Pierre, South Dakota	Jul 50	
MO-13a	Letter Report "Revision to Approved Spillway Design Floods for the Oahe and Fort Randall Reservoir Projects"	Sep 50	
MO-14	AD, Administration Facilities, Pierre, SD Stage II	Oct 50	Not approved
MO-15	DPR Supplemental Report on 5 Tunnel Outlet Works	Nov 50	Mar 51
MO-16	AD, Sheet Pile Walls	Dec 50	Feb 51
MO-17	AD, Earthwork Stage II	Aug 51	Oct 51
MO-18	Letter dated 10 Aug 51, Subject: "Proposed Capacity of Oahe Outlet Works"	Sep 51	
MO-19	Earthwork Stage III	May 53	Jul 52
MO-20	Concrete Aggregates and Riprap	Aug 53	Sep 53
MO-21	Outlet Works, Stage I	Jun 53	Sep 53

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-22	Outlet Works, Control Shafts	Sep 53	Nov 53
MO-23	Outlet Works, Downstream Tunnels	Nov 53	Dec 53
MO-24	Outlet Works, Fine Regulation	Dec 53	Apr 54
MO-25	Outlet Works, Downstream Tunnels (Final Design)	Jan 54	Apr 54
MO-26	Outlet Works, Stilling Basin	Feb 54	May 54
MO-27	Big Bend Reservoir, Preliminary Study	Mar 54	Jan 55
MO-28	Intake Bulkhead Frame	Mar 54	Apr 54
MO-29	Transmissibility Tests, Sheet Pile Cutoff Wall	May 54	Aug 54
MO-30	Letter Report "Headwater Gage and Discharge Measurement Installation"	Jun 54	Jun 54
MO-31	Revised Outlet Works, Stilling Basin (included in DM MO-34)	Jul 54	
MO-32	Outlet Works, Central Control Structures	Sep 54	Dec 54
MO-33	Outlet Works, Shale Drainage	Sep 54	Oct 54
MO-34	Outlet Works, Stilling Basin	Oct 54	Nov 54
MO-35	CMStP&P RR Relocations Vicinity of Mobridge, SD, Main Line - Glenham to Wakpala	Nov 54	Feb 55
MO-36	Slot Bulkhead for the Outlet Works Intake Structure	Dec 54	Dec 54
MO-37	Earthwork Stage IV	Dec 54	Jan 55
MO-38	Outlet Works, Supplement to Section IV - Hydraulic Design, MO-21	Feb 55	Apr 55
MO-39	Report of Power Structures	Apr 55	Jun 55
MO-40	Outlet Works, Control Substructures Stage IV	Apr 55	May 55
MO-41	Outlet Works, Arrangement of Control Superstructures	Jun 55	
MO-42	Outlet Works, Control Substructures (Supplement to MO-40)	Jun 55	Jun 55
MO-43	Relocation of U.S. Highway 212	Jul 55	Oct 55
MO-44	East Access Highway, Hughes County, SD	Aug 55 Rev Nov 55	Dec 55
MO-45	Railroad Relocation Rights-of-way, CMStP&P, Glenham to the Missouri River, Walworth County, SD	May 55	
MO-46	Revised Oahe Reservoir - Segments C and D; Hughes, Sully, and Stanley Counties, SD	Jun 55	
MO-47	Relocation, Water Supply Facilities, Mobridge, SD	Aug 55	Nov 55
MO-48	Spillway Earthwork - Stage I	Sep 55 Rev Jan 56	Feb 56
MO-49	Outlet Works - Gate Frames and Guides	Sep 55	Dec 55

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-50	Letter Report, "Pilot Tube Installation, Oahe Outlet Works, Stage V, Control Superstructure, Oahe Reservoir"	Nov 55	
MO-51	Earthwork Stage V	Oct 55	Dec 55
MO-52	Size of Installation - Number of Power Units	Nov 55	Dec 55
MO-53	Outlet Works Stage V, Control Superstructures (Supplement to MO-41)	Nov 55	Jan 56
MO-54	Sewer Facilities, Mobridge, SD	Jan 56 Rev May 56	Aug 56
MO-55	Outlet Works Stilling Basin	Dec 55	Sep 56
MO-56	Letter Report "Outlet Works Slope Drainage, Additional Drainage Facilities Study, Downstream Outlet Works Area, Oahe Project"	Jan 56	Mar 56
MO-57	Cemetery Relocations	Jan 56	May 56
MO-58	Electrical Work for Outlet Works, Stage V, Control Superstructures (Appendix I to MO-53)	Feb 56	Mar 56
MO-59	REM, East Access Highway, Hughes County, SD	Feb 56	
------	AD, West Access Road		
MO-60	Spillway Structure (Superseded by MO-61)	Mar 56	
MO-61	Oahe Spillway Study of Gated Upstream Control Structure with Deferred Chute Construction	Apr 56	Apr 56
MO-62	Oahe Reservoir Milwaukee RR Crossings of Missouri River and Grand River near Mobridge, SD	Mar 56	Jul 56
MO-63	Report, "Pilot Channel for Oahe Outlet Works (Supplement to Section IV, Hydraulic Design, DM MO-21)	May 56	
MO-64	Outlet Works, Intake Structure Apron and Slope Protection	Jun 56	Aug 56
MO-65	Outlet Works Control Gates	Jul 56	Sep 56
MO-66	Letter Report, "Anchors for Mooring Work Barges, Oahe Outlet Works Intake Structures"	Apr 58	
MO-67	Turbines	Aug 56	Sep 56
MO-68	Extension of Access RR and Bridge	Aug 56	Nov 56
MO-69	Outlet Works Gantry Crane	Aug 56	Sep 56
MO-70	Chicago, Milwaukee, St.Paul and Pacific RR - Moreau and Faith Branch Lines	Aug 56	Oct 56
MO-71	Spillway General and Earthwork - Stage II	Oct 56	Nov 56
MO-72	U.S. Highway 12, Relocation	Sep 56	Jan 57

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-73	Outlet Works Control Gate Hoists	Sep 56	Nov 56
MO-74	Operation and Maintenance, Oahe Project	Sep 56	Feb 57
MO-75	Outlet Works Control Superstructure (Final Design)	Oct 56	
MO-76	Segments M, N, O, and Q - Potter, Walworth, and Dewey Counties, SD	Oct 56	
MO-77	Generators (Superseded by MO-84)	Oct 56	
MO-78	Preliminary Design Report, Powerhouse and Switchyard	Feb 57	
MO-79	Powerhouse Location Criteria, Oahe Reservoir Project	Nov 56	Dec 56
MO-80	Outlet Works Regulating Gates and Hoists	Jan 57	Mar 57
MO-81	Portions of Segments R and S, Relocation of US Highway 12 and CMStP&P Railroad	Dec 56	
MO-82	Turbines (Supplement 1 to MO-67)	Jan 57 Rev Mar 57	Apr 57
MO-83	Relocation of Cheyenne River Indian Agency, Cheyenne Agency, SD, Preliminary Report - Plans, Cost Estimates	Jan 57	May 57
MO-84	Generators (Supersedes MO-77)	Mar 57	May 57
MO-85	Cheyenne River Indian Reservation Relocation Roads, H, K, and L	Apr 57	Sep 57
MO-86	Power Structures, Intake Control Structures	Apr 57	May 57
MO-87	Outlet Works Discharge Channel	May 57	Aug 57
MO-88	REM Segments G, H, and I,	Apr 57	Sep 57
MO-89	General Arrangement of Power Structures and Details of Upstream Tunnels	Apr 57	Jul 57
MO-90	Minneapolis, St.Paul and Sault Ste. Marie RR Relocation Vicinity of Pollock, SD	May 57	Aug 57
MO-91	Outlet Works Lifting Beams	Jun 57	Jul 57
MO-92	Earthwork, Stage VI	Jul 57	Aug 57
MO-93	Report on Power Structures Features, Location of Intake Structures and Upstream Terminals of the Steel Tunnel Liners (Supplement of MO-86 and MO-89)	Jun 57	Jul 57
MO-94	Radio Facilities	Jun 57 Rev Jan 58	Mar 58
MO-95	Appendix to MO-78	Aug 57	
MO-96	Preliminary Design Report, Surge Tanks	Jul 57	Nov 57

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-97	Spillway Discharge Channel, Pilot Channel to River	Aug 57	Nov 57
MO-98	Power Structures, Downstream Tunnels and Liners	Dec 57	May 58
MO-99	Tree Planting	Dec 57	Feb 58
MO-100	REM Portions of Segments P, R, and S and Portions of Relocation Rights-of-Way Lands, CMStP&P	Dec 57	Feb 58
MO-101	Reservoir Clearing	Jan 58 Rev Mar 58	May 58
MO-102	Visitor Facilities - Below Dam	Feb 58	Apr 58
MO-103	Power Structures, Intake Gates and Frames	Mar 58	Aug 58
MO-104	Outlet Works Elevator	Apr 58	Jun 58
MO-105	Power Structures Downstream Tunnels and Liners (Supplement to MO-98)	Apr 58	Jun 58
MO-106	Power Structures, Intake Control Structures, Shaft, Analysis of Design (Supplement to MO-86)	May 58	Jun 58
MO-107	Service Roads - Dam and Vicinity	Sep 58	Jul 59
MO-108	Power Structures, Intake Superstructures	Oct 58	Mar 59
MO-109	Outlet works, Intake Bulkheads	Nov 58	Jan 59
MO-110	Earthwork, Stage VII	Nov 58	Jan 59
MO-111	Power Structures, Intake Gate Service Platform and Trolley	Apr 59	Apr 59
MO-112	Hughes County Road Relocations	Feb 59	Apr 59
MO-113	Campbell County, SD, Road Relocation and Sub-impoundment	Jan 60	Apr 60
MO-114	Sioux Line RR Relocation	Apr 59	
MO-115	Permanent Exhibits for Oahe Powerhouse and Public Service Building	May 59	Jul 59
MO-116	Power Structures, Intake Portable Elevator	Apr 59	Jun 59
MO-117	Power Structures, Intake Bulkheads, Trashracks, and Frames	Apr 59	Jun 59
MO-118	Cam-Wal Power Relocations	Jun 59	Aug 59
MO-119	Relocation of Water Supply Facilities, Standing Rock Indian Reservation, Fort Yates, ND	Jul 59	Aug 59
MO-120	Letter Report "Northwestern Bell Telephone Company, Relocations Vicinity of Mobridge, SD	Sep 59	
MO-121	Letter Report, "Alterations to Facilities - Sully Buttes Telephone Coop" dated 28 Sep 59	Dec 59	
MO-122	Letter Report, "Central Electric Co-op Association Alterations"	Dec 59	

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-123	Embankment Topsoiling and Seeding	Jul 59 Rev Jeb 60	Apr 60
MO-124	Walworth County Road Relocations	Aug 59 Rev Dec 59	Feb 60
MO-125	Road Relocation, Sully County Road 1	Nov 59	Dec 59
MO-126	Derrick Barge 303, Corps of Engineers Hull #308	Sep 59	Nov 59
MO-127	Power Structure, Intake Gate Hoists	Oct 59	Dec 59
MO-128	REM, All Segments 20, 21, and remainder of Segment 22		
MO-129	Power Structures, Intake Gantry Crane	Dec 59	Feb 60
MO-130	CMStP&P RR - Faith Branch Relocation, Dewey County, SD		
MO-131	Cheyenne River Indian Reservation Relocation of Day Schools	Jan 60	Feb 60
MO-132	Power Structures - Intake Bridge	Jan 60	Feb 60
MO-133	Moreau River Railroad and Highway Crossing	Mar 60	May 60
MO-134	Letter Report, "Additional Facilities, Outlet Works Control Superstructures"	Submittal Deferred	
MO-135	Corson County, SD, Road Relocation	Feb 60 1 Rev Jan 61 2 Rev Mar 61	May 60
MO-136	REM, All of Segment 23 and Portion of 24, Campbell and Corson Counties, SD, Emmons and Sioux Counties, ND		
MB-22	Letter Report, "Sewer Facilities, Pierre"	Mar 60	Aug 60
MB-23	Letter Report, "Sewer and Water Facilities, Fort Pierre"	Aug 60	
MO-137	Stanley County, SD, Road Relocation	Mar 60	May 60
MO-138	REM Portion of Segment F, Little Bend Area, Sully County, SD		
MO-139	Huff Indian Village Protection, Resubmitted	Oct 60	Dec 60
MO-140	REM Segments 25 and 26, Emmons and Sioux Counties, SD	Jun 60	
MO-141	Powerhouse Slope Drainage	Jul 60	Aug 60
MO-142	Power Structures - Intake Bridge (Supplement to DM MO-132)	Jul 60	
MO-143	Standing Rock Indian Reservation, Fort Yates, ND; Fort Yates Protection	Jul 60	Aug 60
MO-144	Standing Rock Indian Reservation, Fort Yates, ND; Relocation of Sewer Facilities,	Jul 60	Sep 60
MO-145	Spillway Structure (Superseded by MO-61)	Jan 61	Mar 61
MO-146	Earthwork, Stage VIII	Sep 60	Nov 60

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-147	Moreau-Grand REA Relocations	Sep 60	Nov 60
MO-148	Power Structures, Intake Gated Hoist Stems, Cathodic Protection	Oct 60	Mar 61
MO-149	Northern Pacific Railway Relocation	Dec 60	Mar 61
MO-150	Master Plan for Reservoir Development	Mar 61	Not approved
MO-150B	Revised Master Plan for Reservoir Development (and supplements)	Apr 62	Nov 62
MO-150C	Master Plan, Volume 1 - Master Plan	Dec 78	
MO-150C	Master Plan, Volume 3 - Facilities Development Plan	Aug 78	
MO-150C	Master Plan, Volume 4 - Cost Estimates	Aug 78	
MO-150C	Master Plan, Appendix B - Natural Resource Management Plan	Jul 78	
MO-151	Potter County, SD, Road Relocation	Jan 61	Mar 61
MO-152	Valley Telephone Coop Relocations	Feb 61	Mar 61
MO-153	Spillway Tainter Gate Hoists	Apr 61	Jun 61
MO-154	REM, Segment 38 Fort Yates, Sioux County, ND		
MO-155	REM, Segments 32, 34, 35, and 37, Emmons, Sioux, Morton, and Burleigh Counties, ND	Sep 61	
MO-156	Derrick Barge Harbor	Jun 61	Aug 61
MO-157	Relocation of North Dakota State Highway 24	Jul 61	Jan 62
MO-158	Surface Drainage Powerhouse Slopes	Jul 61	May 62
MO-159	Fish and Wildlife Development	Aug 61	Jan 62
MO-160	Standing Rock Indian Reservation Road Relocation	Nov 61	Jan 62
MO-161	Letter Report, "Relocation of School Facilities, Kenel, SD	Dec 61	
MO-162	Pressure Relief Wells	Dec 61	Feb 62
MO-163	Emmons County Road Relocations	Dec 61	Feb 62
MO-164	Channel Stabilization Below Dam	Feb 62 Rev Mar 63	Jun 63
MO-165	Morton County, ND, Road Relocations	Mar 62	May 62
MO-166	West River Mutual Aid Telephone Corporation	Mar 62	May 62
MO-167	Letter Report, "Installation of Protective Floating Boom Across Tailrace" dated 20 Apr 62	Jun 62	
MO-168	Fallout Protection	May 62	Jul 62
MO-169	Mor-Gran-Sou Electric Cooperative, Incorporated	Jun 62	Aug 62
MO-170	Velocity Struts for Power Plant Transient Tests	Jun 62	Aug 62
MO-171	Alterations to KEM Electric Cooperative Facilities	Nov 62	Jan 63

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-172	Sioux County, SD Road Relocations	Mar 63	Jul 63
MO-173	Winter Protection of Surge Tanks	Apr 63	Jun 63
MO-174	Plan for Acquisition for Fish and Wildlife Resources	Apr 63	May 63
MO-175	Alterations to Capital Electric Distribution Facilities	May 63	Jun 63
MO-176	Alterations to Facilities - BEK Telephone Mutual Aid Corporation	Jun 63	Nov 63
MO-177	Letter Report "Additions to Switchyard Terminal Facilities and Control Equipment for Stegall-230 kv Transmission Line"	Jun 63	Jul 63
MO-178	Lighted Buoys for Protection of Floating Craft	Jun 63	
MO-179	Letter Report "Sectionalizing of 230kv Switchyard Bus Differential Relaying"	Sep 63	Jan 64
MO-180	Letter Report, "On-Project Signs"	Sep 63	
MO-181	REM, Indian Land Required for Reservoir Not Included in PL85-915	Nov 63	
MO-182	Miscellaneous Construction Roads and Grounds	Feb 64	May 64
MO-183	Letter Report, "Garages, Warehouses, and Storage Facilities"	Apr 64	
MO-184	Letter Report, "Relocation of Facilities, NW Bell Telephone Company"	Aug 64	Oct 64
MO-185	Letter Report, "Proposed Access Road to St. Luke's Episcopal Cemetery in lieu of Cemetery Relocation"	Oct 64	Nov 64
MO-186	Crest Road and Exterior Lighting and Administration Area Power Line	Feb 65	Apr 65
MO-187	Letter Report, "Outlet works Stoplogs"	Jun 65	Jul 65
MO-188	Maintenance Facilities	Jan 66	
MO-189	Bank Erosion Protection Below Dam to Fort Pierre	Jan 66	
MO-190	Upstream Boat Harbor	Oct 66	
MO-191	Spring Creek Sub-impoundment, Pollock, SD, Failure report and Repair of Slope Protection	Mar 66	
MO-192	REM, Little Bend Public Use Area, Acquisition of Lands		
MO-193	REM, Relocation of Northern Pacific Railway, Mandan-South Branch Line		
MO-194	CMStP&P RR Crossing Riprap Test Section	Feb 68	Jul 68
MO-195	Mobridge Water Supply Intake, riprap Rehabilitation and Extension	Jan 69	

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-196	Riprap Alterations to Bridge Abutments, US Highways 12 and 212	May 69	
MO-197	Slope Protection Upgrading, CMStP&P RR Crossing near Mobridge, SD,	Aug 69	
MO-198	Protection of Road Embankment-Walworth County, SD	Jan 72	Sep 72
MO-199	Spillway Structure Lighting	Mar 72	Apr 72
MO-200	Boat Ramp Protection and Design - Fort Rice Public Use Area	Feb 71	May 71
MO-201	Surge Tank Elevator	Sep 71	
MO-202	Bank Protection, Indian Creek Public Use Area	Nov 71	
MO-203	Powerhouse Tailrace and Flood Control Tunnels Discharge Channel Riprap	Dec 71	
MO-204	Power System Stabilizer for Control of Generator Excitation	Mar 72	Not approved
MO-205	Alterations to Bridge over Cheyenne River, South Dakota State Highway 63	Feb 74 Rev Oct 74	
MO-206	Additional Facilities, Oahe Maintenance Base	Jan 73	Feb 73
MO-207	Spillway Monorail Crane Installation	May 73	Jun 73
MO-208	Switchyard Control and Protection	Mar 75	Apr 75
MO-209	Powerhouse and Maintenance Facility Waste Disposal	Aug 75	Sep 75
MO-210	Addition to Switchyard Terminal Facilities and Control Equipment for Fort Pierre 115kv Transmission Line	Sep 77	Oct 77
MO-211	Powerhouse Tailrace Slab Rehabilitation	Dev 77	Apr 77
MO-201	Revised - Surge Tank Elevator	Nov 71	Apr 79
MO-201	Supplement 2 - Surge Tank Elevator	Jul 80	Jul 80
MO-212	Downstream Electrical Distribution System (Recreation Areas)	Apr 78	May 78
MO-213	Recreation Facilities - Cattail Bay	Jul 79	
MO-214	Recreation Facilities - Pollock Public Use Area	Jul 79	
MO-215	Rehabilitation, Comfort Station	Mar 80	Jun 81
MO-216	Ralph Ritter Development, Lower Bank Slope Protection	Apr 82	May 82
MO-217	Walth Bay Archeological Site, Bank Slope Protection	Nov 82	Dec 82
MO-218	Bank Stabilization Downstream from Channel Block 6	Jul 83	Aug 83
MO-219	Revised Powerhouse Lighting	Nov 85	Dec 85
MO-220	Fishing Pier for the Handicapped	Sep 87	Feb 88
MO-221	Havens Site Bank Stabilization Site	Oct 86	May 87
MO-222	West Whitlocks Bay Recreation Area - Bank Stabilization	May 88	

NUMBER	TITLE	DATE SUBMITTED	DATE APPROVED
MO-223	Fort Yates Bridge		
MO-224	Master Plan		
M(Gen) 7	Security Fencing for Fort Peck, Garrison, Oahe, and Big Bend	Mar 73	
M(Gen) 13	Main Stem Fire Detection and Security System; Gavins Point, Fort Randall, Big Bend, Oahe, Garrison, Fort Peck	Apr 79	
M(Gen) 15	Fish and Wildlife Mitigation Plan; Lake Oahe and Lake Sharpe	Jul 81	
M(Gen) 16	Recreation and Fishery Development Plan; Lake Oahe, Lake Sharpe, Lake Francis Case, Lewis and Clark Lake	Oct 82	
M(Gen) 19	Implementation Plans for Wildlife Mitigation; Lake Oahe, Lake Sharpe		Mar 88
	Section 22 Study, South Dakota: Cost Effectiveness of shoreline Erosion Protection at Missouri River Reservoir Recreation Areas, Lake Oahe	Sep 91	
	USFWS 2000 Biological Opinion: Operation of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System	Nov 00	
	Final EA for the Lease of 22 Recreation Areas at Lake Oahe, Lake Francis Case, and Lewis and Clark Lake to the State of South Dakota		
	Final EIS, Title VI Land Transfer, South Dakota	Jul 08	Dec 08

ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standards
AC-FT	Acre-feet
AC-FT/YR	Acre-feet per year
ACHP	Advisory Council for Historic Preservation
AIRFA	American Indian Religious Freedom Act
ANS	Aquatic Nuisance Species
ARPA	Archeological Resource Protection Act
ASA	American Sportfishing Association
BIA	Bureau of Indian Affairs
BiOp	Biological Opinion
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
BP	Before Present
C&NW	Chicago and North Western Railroad
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
C.F.S.	Cubic feet per second
Corps	Corps of Engineers
CRMP	Cultural Resources Management Plan
CRST	Cheyenne River Sioux Tribe
DEIS	Draft Environmental Impact Statement
District 5	South Dakota SCORP, Planning and Development District 5
DM	Design Memorandum
DO	Dissolved Oxygen
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EM	Engineer Manual
EMS	Environmental Management System
EPA	Environmental Protection Agency
ER	Engineer Regulation
ESA	Endangered Species Act
F	Fahrenheit
FWCA	Fish and Wildlife Coordination Act
FWS	Fish and Wildlife Service
FY	Fiscal Year
GPA	Game Production Area
GSA	General Services Administration
HQUSACE	Headquarters, U.S. Army Corps of Engineers
KAF	Thousand Acre Feet

LBST	Lower Brule Sioux Tribe
LUDP	Land Use Development Policy
LWCF	Land and Water Conservation Fund
LWCFA	Land And Water Conservation Fund Act
MAF	Million Acre Feet
MBCC	Migratory Bird conservation Commission
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPH	Miles Per Hour
MRD	Missouri River Division, U.S. Army Corps of Engineers
MSA	Metropolitan Statistical Area
MSL	Mean sea level
MU	Management Unit
NAGPRA	Native American Graves Protection and Repatriation Act
NAWCC	North American Waterfowl Conservation Council
NAWMP	North American Waterfowl Management Plan
NDDC	North Dakota Department of Commerce
NDDH	North Dakota Department of Health
NDGF	North Dakota Game & Fish Department
NDGS	North Dakota Geological Survey
NDNHP	North Dakota Natural Heritage Program
NDPRD	North Dakota Park and Recreation Department
NEPA	National Environmental Policy Act
NPS	National Park Service
NRCS	Natural Resources and Conservation Service
NRHP	National Register of Historic Places
NRMS	Natural Resources Management System
OMP	Operational Management Plan
ORV	Offroad Vehicle
PA	2004 Programmatic Agreement for Operation and Management of the Missouri River Main Stem System for Compliance with National Historic Preservation Act
PAR	Post-Authorization Mitigation Report
PL	Public Law
PPJV	Prairie Pothole Joint Venture
RA	Recreation Area
RM	River Mile
RMO STUDY	Recreation Management Opportunities, Inc. "Market Analysis & Feasibility of Recreation & Tourism Development of the Missouri River Basin in South Dakota
RO	Resource Objective
RPA	Reasonable and Prudent Alternative

RV	Recreational Vehicle
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SDDH	South Dakota Department of Health
SDGFP	South Dakota Department of Game, Fish, and Parks
SDNHP	South Dakota Natural Heritage Program
SDTF	South Dakota Terrestrial Wildlife Habitat Restoration Trust Fund
SHPO	State Historic Preservation Officer
SQ. MI.	Square Mile(s)
SRST	Standing Rock Sioux Tribe
T&E	Threatened and Endangered Species
THPO	Tribal Historic Preservation Officer
TITLE VI	Public Law 106-53, Title VI - Cheyenne River Sioux Tribe, Lower Brule Sioux Tribe, and State of South Dakota Terrestrial Wildlife Habitat Restoration, as amend
TMDL	Total Maximum Daily Loads
TSI	Trophic State Index
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAPA	Western Area Power Administration
WES	Waterways Experiment Station
WQS	Water Quality Standards
WRDA	Water Resources Development Act
USDA	U.S. Department of Agriculture

CHAPTER 1
INTRODUCTION

The Oahe project was authorized for flood control, navigation, hydropower, fish and wildlife, recreation, irrigation, municipal and industrial water supply, and water quality. This updated master plan guides the use and development of the natural and manmade resources of the project. It affirms land classifications and management practices similar to those already in effect. It also provides for recreational opportunities while maintaining the integrity of the natural resources. The master plan outlines development needs, analyzes special problems, and provides guidance on public use, water quality, natural areas, and historic properties within U.S. Army Corps of Engineers' (Corps) boundaries.

The Corps is the steward of the lands and waters at its water resources projects. Its natural resources management mission is to manage, conserve, and enhance these natural resources and the environment while providing quality public outdoor recreation experiences to serve the needs of present and future generations. In all aspects of natural and cultural resource management, Corps managers promote awareness of environmental values and adhere to sound environmental stewardship, protection, compliance, and restoration practices.

The master plan provides for stewardship of natural resources and manages for long-term public access to, and use of, the natural resources. The Corps conserves natural resources and provides recreation opportunities that contribute to the quality of American life. The planning process is conducted in cooperation with other Federal, State, Tribal, and local governmental agencies, as well as the private sector. The land classifications and management guidelines contained in this master plan reflect the potentials of the natural resources of the area and the identified population and visitation patterns.

This master plan update reflects changes made under the Title VI land transfer, mandated by the 1999 Water Resources and Development Act (WRDA) (Public Law (P.L.) 106-53, Title VI – Cheyenne River Sioux Tribe, Lower Brule Sioux Tribe, and State of South Dakota Terrestrial Wildlife Habitat Restoration) as amended by the 2000 WRDA (P.L. 106-541). Under the Title VI land transfer the Corps is required to 1) transfer in fee title certain lands (outside the boundaries of Indian reservations) above elevation 1620 feet m.s.l., the top of the exclusive flood control pool, to the State of South Dakota to be managed by the South Dakota Game, Fish, and Parks Department (SDGFP); 2) transfer in fee title lands within the boundaries of the Cheyenne River Sioux Tribe (CRST) and Lower Brule Sioux Tribe (LBST) Indian Reservations that are above elevation 1620 feet m.s.l. to the Department of Interior (DOI) to be managed in trust for the two tribes; 3) transfer all remaining Corps recreation areas in South Dakota above elevation 1607.5 feet m.s.l. to SDGFP; and 4) establish the South Dakota Terrestrial Wildlife Habitat Restoration Trust Fund, Cheyenne River Sioux Tribe Terrestrial Wildlife Habitat Restoration Trust Fund, and Lower Brule Sioux Tribe Terrestrial Wildlife Habitat Restoration Trust Fund to pay for wildlife restoration work, cultural resources preservation, and management of transferred lands. Under the provisions of Title VI, the Corps retains fee title to lands and structures necessary for the operation of the Oahe dam and related flood control and hydropower structures, including land below elevation 1620 m.s.l..

PROJECT DESCRIPTION

The Oahe Dam and Lake Oahe were named for the Oahe Mission. In 1874, Reverend Thomas Riggs, a Congregationalist Minister, established the Oahe Mission to serve the Sioux Indians. He chose the site of an old Arikara Indian Village, which the Sioux called "Ti Tanke Ohe" ("site of the large house") for the dirt council lodge located there. Shortened to "Oahe," the name of the village was eventually given to the mission and later to the dam and lake that now cover the area.

The Oahe Dam/Lake Oahe project is part of the chain of Missouri River main stem lakes authorized in the Flood Control Act of 1944 (Figure 1-1). Construction of the project was started in 1948. On 17 August 1962, President Kennedy came to the dam and officially dedicated the first two power generators. The seventh and final generator went into operation in June 1963.

The Oahe dam and reservoir (Figure 1-2) is one of six such Corps projects located on the Missouri River. Lake Oahe is situated in the prairie environment of the northern Great Plains, where the surrounding vegetation is predominately grass. Woody vegetation accounts for less than two percent of the land cover.

At maximum normal operating pool level, (1617 feet mean sea level (m.s.l.)) Lake Oahe extends roughly 231 miles from Oahe Dam, six miles north of Pierre, South Dakota, to near Bismarck, North Dakota. At this level, the lake covers approximately 360,000 acres. At elevation 1607.5 m.s.l., base flood control elevation, the lake has over 2,250 miles of shoreline.

The lake varies in width from a maximum of over 2 miles near the dam, to about 1,200 feet near Bismarck where it is confined to the old river channel. Lake Oahe can be divided into three segments based on the character of the lake. The southern segment extends from the dam to just south of Mobridge, South Dakota. This portion of Lake Oahe is characterized by water depths that may approach 200 feet, relatively few boating hazards, and very little current. The middle segment, extending from south of Mobridge, South Dakota to the North Dakota/South Dakota State line, is a transition area exhibiting characteristics of both a lake and a river. Some snags and sandbars are present, water depths are less, and some slight current is evident. The northern segment extends north from the North Dakota/South Dakota State line to the upstream project boundary near Bismarck. This segment is more river-like in appearance and is characterized by both submerged and emergent snags, sandbars, many shallow areas, and a definite current.

Lake Oahe is a long, narrow lake; however, several very large bays contribute to Lake Oahe's diversity. Okobojo Creek Bay, located approximately 10 miles northwest of the dam, is almost 5 miles long and the Cheyenne River arm of the reservoir, located about 30 miles northwest of the dam, is approximately 30 miles long. The Grand River arm, located just north of Mobridge, South Dakota, and the Moreau River arm, located about 13 miles south of Mobridge, are each roughly 15 miles long.

Activities at Lake Oahe range from picnicking, camping, fishing, and hunting, to nature walks, touring the dam and related facilities, and visiting historic and interpretive sites. There were an estimated 1,569,400 visits to the lake in fiscal year 2008 (USACE 2008a).

PROJECT AUTHORIZATION

The Oahe project was authorized by the Flood Control Act of 1944, Public Law 534, 78th Congress, 2nd Session, along with four other Missouri River main stem projects - Gavins Point, Fort Randall, Big Bend, and Garrison. These five reservoirs are elements of a plan for the development of the Missouri River main stem. This main stem plan is a component of the comprehensive river basin development program in the Missouri River Basin, the Pick-Sloan Plan. Formed from separate proposals recommended by the Bureau of Reclamation and the Corps, the Pick-Sloan Plan was one of the first of such plans nationwide that recognized the role of tributary basins and the importance of comprehensive planning in flood control. Fort Peck Dam, located in northeastern Montana, was constructed prior to the Pick-Sloan Plan but is operated as part of the Missouri River main stem system.

PROJECT PURPOSES

The Oahe project is a unit of the comprehensive plan for development in the Missouri River basin. Criteria described in the Missouri River Master Water Control Manual are formulated to ensure water management in accordance with the following project purposes.

FLOOD CONTROL

Lake Oahe is operated to impound water for regulation, assist in the control of floods through its flood control storage and temporary surcharge, and provide further safety to the Big Bend, Fort Randall, and Gavins Point projects in the case of a flood event of spillway design magnitude. Based on yearly Corps calculations of flood damages prevented, the main stem system has prevented $40.7 billion in damages (2009 dollars) through September of 2009, of which $8.3 billion was credited to the Oahe project.

NAVIGATION

Although the South Dakota stretch of the Missouri River was originally used for navigation, commercial navigation today is limited to the stretch of the Missouri River between Sioux City, Iowa and the mouth near St. Louis. One of Lake Oahe's primary water management functions is to provide the extra water needed to meet project purposes during low-water years, especially downstream water supply and navigation (USACE 2006b). Over the long term, the release rates at Oahe and Big Bend dams are geared to back up navigation releases from Fort Randall and Gavins Point Dams and maintain an 8- to 9-foot deep navigation channel).

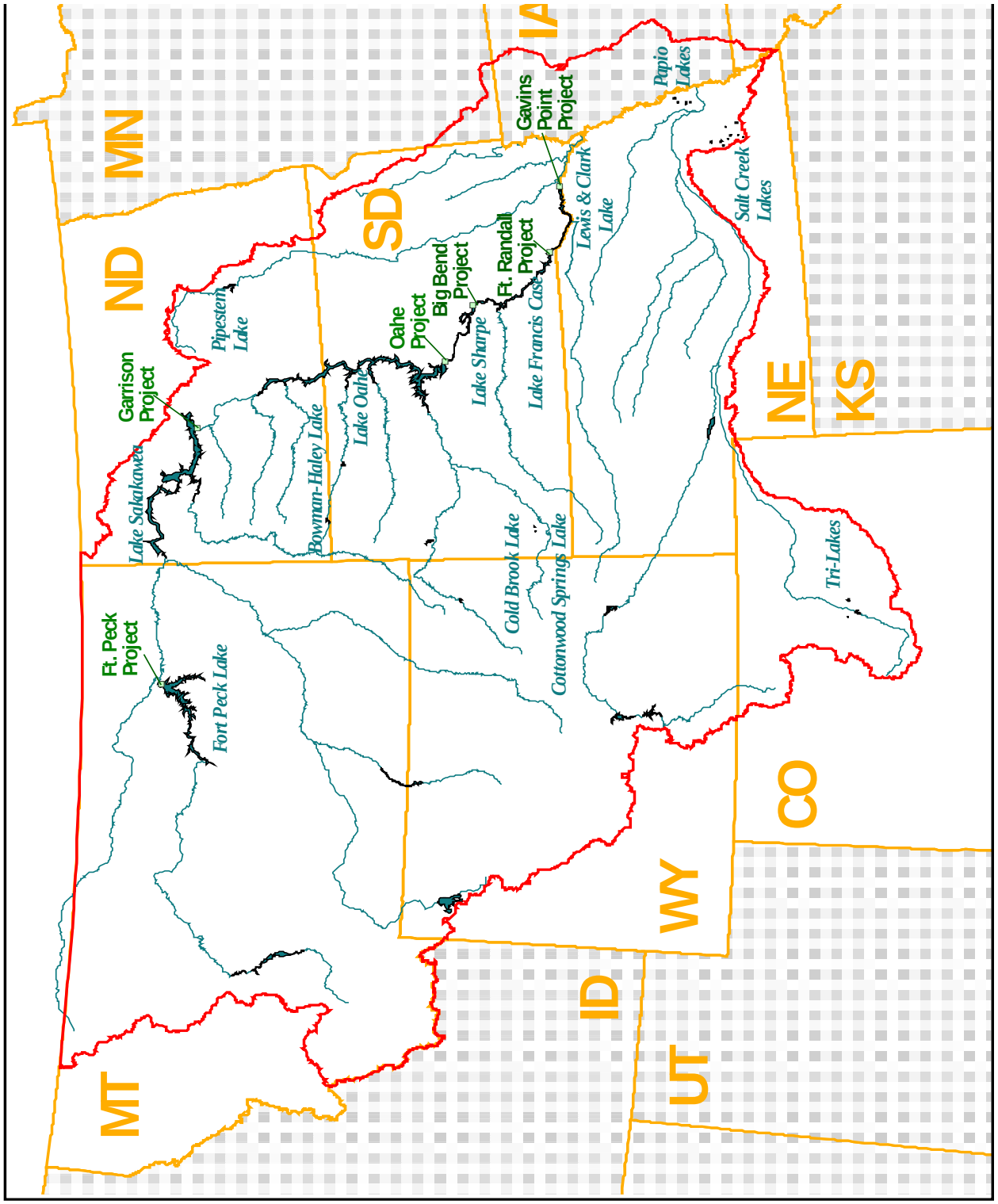


Figure 1-1
Omaha District Civil Works Boundary Emphasizing the Missouri River Main Stem System of Six Dams and Reservoirs

Figure 1-2
Location Map for the Oahe Project

HYDROPOWER

The Oahe power plant is operated as a "peaking" plant. Oahe releases fluctuate in an effort to generate the greatest amount of energy at the times the power demand is the greatest. All power generated is marketed by the Western Area Power Administration (WAPA). The powerhouse has 7 generating units currently rated at 112,300 kilowatts each for a total installed capacity of approximately 786,000 kilowatts - the largest in the main stem system (USACE 2006b).

FISH AND WILDLIFE

This project purpose is a high priority on project lands regardless of their classification. Project lands classified as either "Operations" or "Recreation" are managed for incidental benefit to wildlife through a variety of techniques including vegetative management. The remaining project lands are also managed to enhance and benefit wildlife species.

RECREATION

The Oahe project is managed to provide a high-quality outdoor recreation experience with plenty of diversity. Recreation at Lake Oahe is predominantly water-based, with boating and fishing as major activities. In addition, a significant amount of hunting takes place on project lands. Over 50 recreation areas are located on Lake Oahe ranging from undeveloped lake access points to highly developed and extensively used campgrounds. Park and recreation facilities on Lake Oahe are supportive of and compatible with the Statewide Comprehensive Outdoor Recreation Plans (SCORP) of both South Dakota and North Dakota.

IRRIGATION

The Bureau of Reclamation began construction on the Oahe Diversion Unit in 1977. When completed, this project was to provide irrigation water to approximately 190,000 acres in east-central South Dakota. However, because of the difficulty in obtaining easements from local landowners and the overall lack of support, construction on this project was terminated in 1978. The irrigation projects that do exist are primarily withdrawals for center-pivot irrigation systems. There are 208 irrigation intakes on Lake Oahe (USACE 2006b).

MUNICIPAL AND INDUSTRIAL WATER SUPPLY

There are 8 municipal intakes, 2 industrial intakes, 21 domestic intakes, and 8 public intakes on Lake Oahe (USACE 2006b). The public water systems for Fort Yates, North Dakota, and Mobridge, Wakpala, Gettysburg, Eagle Butte, South Dakota, as well as many smaller communities all depend on Lake Oahe waters. Also, WEB (Walworth-Edmunds-Brown), Mid-Dakota Rural Water and South Central Rural Water Systems use water from Lake Oahe. The municipal water supply facilities at Lake Oahe serve a population of approximately 150,000 people.

WATER QUALITY

Water Quality was authorized as a project purpose in the 1944 Flood Control Act. This included silt control; soil erosion prevention; pollution abatement; adequate and safe municipal water

supplies; improving water quality for irrigation; provision of water suitable for domestic, sanitary and industrial purposes; and improving the clarity of water for recreation and for fish and wildlife.

PURPOSE AND SCOPE OF THE MASTER PLAN

PURPOSE

The master plan provides guidelines and direction for project development and use. It is based on responses to regional and local needs, resource capabilities and suitabilities, and expressed public interests consistent with authorized project purposes and pertinent legislation. The master plan provides a District-level policy consistent with national objectives and other State and regional goals and programs. This master plan includes guidance for the use and development of the natural and manmade resources at the Oahe Dam/Lake Oahe project. The plan includes: (1) a comprehensive description of the project; (2) a discussion of factors influencing resource management and development; (3) an identification and discussion of special problems; (4) a synopsis of public involvement and input; and (5) descriptions of past, present, and proposed development.

The master plan is distinct from the project-level implementation emphasis of the Operational Management Plan (OMP). Policies in the master plan are guidelines implemented through provisions of the OMP, specific Design Memorandums, and the Annual Management Plans. The broad intent of this Oahe Master Plan is to document policies and analyses that do the following:

1. Determine appropriate uses and levels of development of project resources;
2. Provide guidelines within which the OMP and Annual Management Plans can be developed and implemented; and
3. Establish a basis on which outgrants and recreational development proposals can be evaluated.

This updated master plan was prepared in accordance with the following guidance:

- Engineer Manual (EM) 1110-1-400, Engineering and Design – Recreation Planning and Design Criteria, 31 July 1987;
- Engineer Pamphlet (EP) 1130-2-550, Project Operations – Recreation Operations and Maintenance Guidance and Procedures, 15 November 1996;

- Engineer Regulation (ER) 200-1-5, Environmental Quality – Policy for Implementation and Integrated Application of the U.S. Army Corps of Engineers Environmental Operating Principles (EOP) and Doctrine, 30 October 2003;

- ER 200-2-2, Environmental Quality – Procedures for Implementing the National Environmental Policy Act (NEPA), 4 March 1988;

- ER 1105-2-100, Planning Guidance, 22 April 2000 (with Appendices D and G revised June 2004 and Appendix F revised January 2006); and

- ER 1130-2-550, Project Operations – Recreation Operations and Maintenance Guidance and Procedures, 15 November 1996 (with changes 1 October 1999, 1 March 2002, and 15 August 2002).

SCOPE

This plan represents overall policy and management concepts applicable to the Oahe Dam/Lake Oahe project. Detailed cost estimates are not appropriate for master plans because they soon become outdated. Development needs are presented in conceptual terms, not in detail. The lifespan of this updated master plan is intended to direct the use and development of the Oahe project resources for the next 15-20 years.

Master plans should not be confused with general plans required under the Fish and Wildlife Coordination Act of 1958 (85-624). According to the Fish and Wildlife Coordination Act, when a Federal agency impounds, diverts, or deepens the waters of a stream or other water body, a general plan must be created for managing the fish and wildlife resources of the associated areas of land or water administered by the agency. These general plans must be approved by the U.S. Fish and Wildlife Service, the State wildlife agency, and the Federal agency. While general plans are cooperative plans that address the management of only fish and wildlife resources, master plans are Corps planning documents that address the management of Corps fee-title lands for a variety of uses, including recreation, vegetative management, and wildlife management.

A general plan was created for the Oahe Reservoir in 1960 and was titled "A Plan for Fish and Wildlife Resources of the Oahe Reservoir, North Dakota and South Dakota." The plan was signed by the U.S. Fish and Wildlife Service (FWS), the North Dakota Game and Fish Department (NDGF), and the South Dakota Department of Game, Fish, and Parks (SDGFP).

Lands transferred in fee title under Title VI of P.L. 105-53, Water Resources Development Act (WRDA) of 1999, as amended by P.L. 106-541, Water Resources Development Act of 2000, are not included in this master plan. These lands are managed by the receiving entities in perpetuity for the restoration of terrestrial wildlife habitat loss that occurred as a result of flooding related to the Oahe project and other reservoir projects carried out as part of the Pick-Sloan Missouri River Basin Program. For the Oahe project, Title VI required that the CRST and the SDGFP develop a plan for the restoration of terrestrial wildlife habitat loss that occurred as a result of flooding related to the Oahe project carried out as part of the Pick-Sloan Missouri River Basin program.

Under the provisions of Title VI, the Government retains fee title to lands and structures necessary for continuation of the operation, maintenance, repair, replacement rehabilitation, and structural integrity of the Oahe dam and related flood control and hydropower structures, including land below the top of the exclusive flood control pool. For transferred recreation areas, the SDGFP will manage land above elevation 1607.5 feet m.s.l while the Corps will manage land below elevation 1607.5; CRST will manage lands above elevation 1620 feet m.s.l. For transferred wildlife management areas, the SDGFP and CRST will manage land above elevation 1620 feet m.s.l. while the Corps will manage land below elevation 1620 feet m.s.l. The Government may lease in perpetuity all or part of certain recreation areas associated with the Oahe project. East Shore Recreation Area, West Shore Recreation Area, and Downstream Recreation Area were not transferred in fee under Title VI. Appendix A shows recreation management areas that have been transferred to the State of South Dakota. Development of park facilities in these areas is at their discretion and not covered in this master plan.

In 1996, the Standing Rock Sioux Tribe (SRST), which chose not to participate in the Title VI legislation, expressed an interest in managing areas located within the exterior boundaries of the Standing Rock Sioux Reservation. The Corps will coordinate with the Tribe for the management of Corps-managed areas within the exterior boundaries of the Standing Rock Sioux Reservation with the exception of those areas that are under another real estate instrument (easement, lease, or license).

PROJECT-WIDE RESOURCE OBJECTIVES

The function of the Oahe Master Plan is broader than the construction and use of recreational facilities. The master plan also includes the stewardship of project resources, both natural and manmade. Sound stewardship requires the development and management of project resources for the public benefit, consistent with resource capabilities. An important component of this approach is the establishment of viable resource objectives.

Resource objectives are realistically attainable goals for the use, development, and management of natural and manmade resources. They are guidelines for obtaining maximum public benefits while minimizing adverse impacts and protecting and enhancing environmental quality. They are developed with full consideration of authorized project purposes, applicable Federal laws and directives, resource capabilities, regional needs, plans and goals of regional and local governmental units, and expressed public desires. The project-wide resource objectives for Lake Oahe, not in priority order, are as follows:

- To develop and manage land and waters in full cooperation and coordination with other public management agencies and appropriate private sectors;

- To develop and manage the Oahe project lands and waters to support various types and levels of recreation activities consistent with carrying capacities and aesthetics,

cultural, and ecological values;

- To provide public education about the history of the area, Oahe project resources, and the Corps' role in developing and managing these resources;

- To develop and manage the project lands and waters to support a diversity of fish and wildlife species;

- To preserve and protect threatened and endangered species and unique and important ecological and aesthetic resources;

- To maintain and manage project lands and waters to support regional management programs, such as regional conservation programs for the least tern, piping plover, and pallid sturgeon in support of the Biological Opinion on the Missouri River;

- To preserve, monitor, and protect significant cultural resource sites;

- To maintain a high quality water supply for irrigation, water supply, recreation, fish and wildlife use; and

- To manage resources in response to sedimentation trends.

To evaluate the potential for creating habitat for the least tern and piping plover within the reservoir to supplement natural habitat. Although not yet determined for specific locations within the reservoir these actions would benefit endangered, threatened, and rare species and communities and would be coordinated with the FWS and other relevant agencies. These potential habitat creation actions as called for in the FWS Amended 2003 Biological Opinion include but are not limited to: (1) replenishment or nourishment of river sandbars and islands; (2) creation of suitable nesting habitat in reservoir depositional zones; (3) creation or enhancement of shallow and backwater areas, off-channel chutes, and flats as foraging habitat; (4) removal of early successional vegetation from nesting areas; (5) peninsular cutoffs or island creations in reservoir side bays; and (6) dike construction to dewater reservoir side bays for nesting and foraging habitat (USFWS 2003). The Missouri River Recovery Program will be evaluating and potentially implementing tern and plover habitat projects within the reservoir.

Specific resource objectives for each of the five land classifications identified for Lake Oahe project lands are found in Chapter 5. Site-specific resources objectives are listed for the individual management units in Chapter 6.

CHAPTER 2
FACTORS INFLUENCING RESOURCE MANAGEMENT AND DEVELOPMENT

This chapter provides an overview of key factors that influence and constrain present and future options for the use, management, and development of land and water resources at the Lake Oahe project. These factors fall into three general, somewhat interrelated categories: natural resources, historical and social resources, and administrative and policy factors. An analysis of these factors, as well as regional needs and desires, results in a framework that minimizes the adverse impacts to the environment, and resolves the competing and conflicting uses. The information presented in this chapter was used for the resource plan that determines land classifications, develops project-wide resource objectives, and identifies specific facility needs.

DESCRIPTION OF THE RESERVOIR

Oahe Dam was the fourth of the five Pick-Sloan dams to be completed on the Missouri River and became fully operational in 1962. Lake Oahe, the reservoir impounded by Oahe Dam, follows a 231-mile-long course from 6 miles north of Pierre, South Dakota to just south of Bismarck, North Dakota. The average width of the reservoir is 1.7 miles and the maximum depth is 200 feet near the dam. At its maximum normal operating pool elevation of 1617 feet m.s.l., the reservoir has a surface area of roughly 360,000 acres. At its base flood control elevation of 1607.5 feet m.s.l., the lake has over 2,250 miles of shoreline, more shoreline than the State of California. At its maximum operating pool elevation of 1620 feet m.s.l., the storage capacity of the reservoir is over 23.1 million acre-feet. By this standard, it is the third largest reservoir in the United States, after Lake Mead and Lake Sakakawea (USACE 2005).

A thin layer of silty material covers the bottom of the reservoir immediately upstream from Oahe Dam. This silt can be attributed to either bank erosion or tributary inflow. The condition generally exists over the entire lake except near tributary confluences.

Five major tributaries empty into Lake Oahe: the Heart and Cannonball Rivers in North Dakota and the Grand, Moreau, and Cheyenne Rivers in South Dakota. The velocities of these tributaries slow as they enter the lake, causing larger clay- to sand-sized sediment to settle to the lake bottom while finer material is carried far into the lake and forms a delta. The delta grows predominately in the downstream direction, but backwater effects also cause the delta to grow in the upstream direction. Materials deposited in the backwater area of the delta increase the water surface elevation, which in turn can increase local groundwater levels and lowland flooding.

Prior to the creation of the reservoir, the Missouri River floodplain was covered by large stands of trees, grasslands, and wet meadows. Today, stump remnants and snags of trees are present both above and

below the water surface.

RESERVOIR REGULATION

Lake Oahe is regulated as an integral component of the system of six main stem dams and reservoirs on the upper Missouri River. To achieve full coordination within the entire Missouri River basin and to meet all of the authorized project purposes, regulation of all six main stem reservoirs is directed by the Northwestern Division, Missouri River Basin Water Management Division located in Omaha, Nebraska. The six main stem reservoirs regulated by the Corps are listed in Table 2-1.

Table 2-1
Missouri River Main Stem Reservoirs

PROJECT	INCREMENTAL DRAINAGE AREA (Square Miles)	CLOSURE DATE	FLOOD CONTROL AND MULTIPLE USE STORAGE (KAF1)	TOTAL STORAGE (KAF)
Fort Peck	57,500	1937	2,717	18,688
Garrison	123,900	1953	4,222	23,821
Oahe	62,090	1958	3,201	23,137
Big Bend	5,840	1963	117	1,798
Fort Randall	14,150	1952	1,309	5,418
Gavins Point	16,000	1955	90	470

1KAF = thousand acre feet

Lake Oahe provides a significant storage contribution to the main stem system of reservoirs. In terms of storage, it is the second largest of the six reservoirs, with a storage capacity of 23.1 million acre-feet (MAF) comprising 31 percent of the total 73.3 MAF system storage capacity.

For the purpose of regulation, the storage capacity at Lake Oahe is divided into four zones:

- Permanent Pool - Starting at the bottom, there is a 5.4 MAF permanent pool between elevations 1415 to 1540 feet m.s.l.. This zone provides minimum power head and sediment storage capacity. It also serves as a minimum pool for recreation, fish and wildlife, and an assured minimum level for pump diversion of water from the reservoir.

- Carryover and Multiple Use Zone - Above the permanent pool there is the 13.5 MAF carryover and multiple use zone between elevations 1540 and 1607.5 feet m.s.l. This intermediate zone provides a storage reserve for irrigation, navigation, power production, and other beneficial

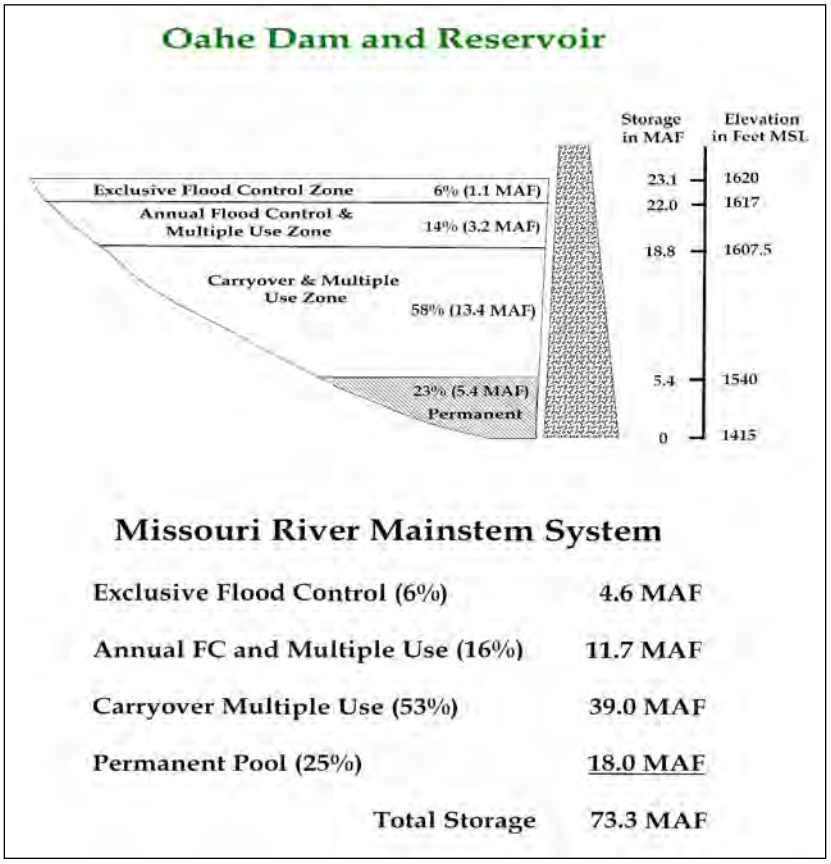
conservation uses. This zone also provides carryover storage for maintaining downstream flows through a succession of below normal runoff years.

- Annual Flood Control and Multiple Use Zone - The next zone is the 3.2 MAF annual flood control and multiple use zone between elevations 1607.5 and 1617 feet m.s.l.. This is the desired operating zone. This zone is normally evacuated by March 1 of each year to provide adequate storage capacity during the flood season. During the flood period, water is impounded in this space as required and then released through the remainder of the year to serve other authorized purposes.

- Exclusive Flood Control Zone - Finally, the upper zone, or exclusive flood control zone, consists of 1.1 MAF of storage between elevations 1617 and 1620 feet m.s.l.. This zone is used only during periods of extreme floods and is evacuated as soon as downstream conditions permit.

These four zones for Lake Oahe are shown in Figure 2-1. Figure 2-1 also shows the four zones for the entire main stem system in tabular form.

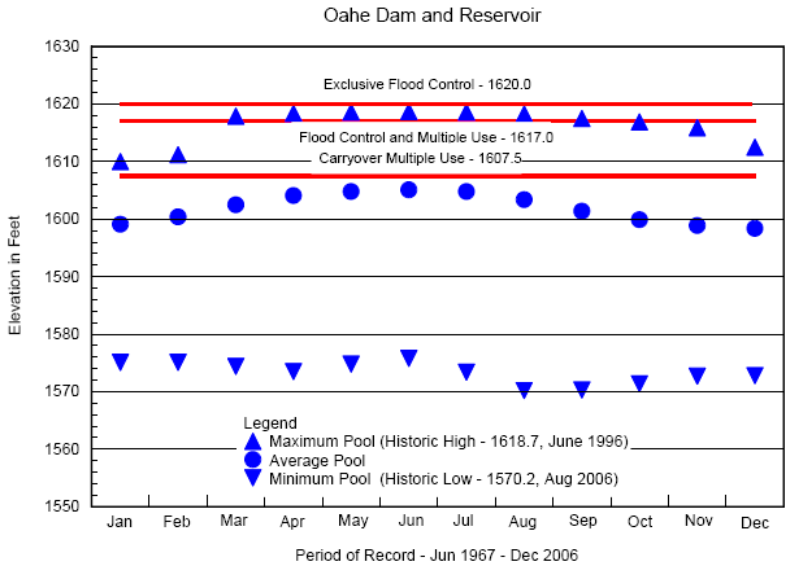
Figure 2-1
Oahe Storage Zones



Regulating the Missouri River main stem reservoir system is essentially a repetitive annual cycle. The reservoirs are evacuated to the bottom of the annual flood control and multiple use zones by March 1. Because the major portion of the annual runoff enters the reservoirs between March and July, storage accumulates and usually reaches a peak during early July. As Lake Oahe releases are increased throughout the summer and fall to provide support for hydropower production and other authorized purposes, the reservoir begins a steady decline and reaches a low near the end of November. As releases from the upstream projects of Fort Peck and Garrison are increased for winter power generation, Lake Oahe begins to rise and is refilled to the top of the carry-over multiple-use zone (elevation 1607.5 feet m.s.l.) by March 1 and the cycle begins once more. During drought years Lake Oahe experiences a similar, but compressed, annual cycle reaching its peak in June or July because of the melt of the plains and mountain snowpack, and its minimum in the late summer or early fall prior to the start of the annual fall drawdown of Fort Randall reservoir. The Fort Randall fall drawdown begins earlier during drought years because of the shortened navigation season. During periods of extended drought, reservoir storage in the carryover multiple use zones of the upper three main stem projects, Fort Peck, Garrison, and Oahe, is lessened to serve all authorized purposes.

Figure 2-2 shows a graphic plot of the maximum, average, and minimum Lake Oahe elevations for the period of record, 1967-2006, since the main stem reservoir system first filled to normal operating levels in 1967. During extreme flood events, the lake level could reach as high as the maximum surcharge pool, elevation 1644.5 feet m.s.l.

Figure 2-2
Lake Oahe Pool Elevations



During drought conditions, the carryover multiple use zone, which contains 58 percent of the Lake Oahe storage, is used to supplement deficient inflows to continue limited service to all of the authorized project

purposes of the main stem system. Most of the carryover and multiple use zone would be used during a repeat of the record 12-year drought of the 1930's.

The Missouri River Main Stem Reservoir System Master Water Control Manual (Master Manual), was first published in 1960 and subsequently revised during the 1970's. It was revised in March 2004 to include more stringent drought conservation measures and again in March 2006 to include technical criteria for a spring pulse from Gavins Point Dam to benefit endangered species. The main stem system is currently regulated for three species protected under the Endangered Species Act (ESA): the endangered interior least tern, the threatened piping plover, and the endangered pallid sturgeon. The 2004 revision of the Master Manual represented the culmination of a review that began in 1989 during the first major drought the Missouri River basin experienced since the system first filled in 1967.

The purpose of the study was to identify a water control plan that would serve the congressionally authorized project purposes, comply with current environmental laws, and meet the Corps' trust and treaty obligations to the federally recognized Tribes. The 2006 revision of the Master Manual was a result of the U.S. Fish and Wildlife Service's (USFWS) 2003 Amendment to the 2000 Biological Opinion (BiOp) - "The Operation of the Missouri River Main Stem Reservoir System, Bank Stabilization and Navigation Project, and the Kansas River Reservoir System" (BiOp, as amended 2003). The amended BiOp presented the USFWS's opinion that the regulation of the system would jeopardize the continued existence of the endangered pallid sturgeon. The amended BiOp provided, among other things, a Reasonable and Prudent Alternative (RPA) to jeopardy that included a provision for the Corps to develop a bimodal "spring pulse" from Gavins Point Dam. In March 2006, the Master Manual was revised to include technical criteria for this bimodal spring pulse.

EFFECTS OF OPERATIONS ON RECREATION

Lake Oahe normally reaches its highest elevation during the summer recreation season. However, starting in early July of a normal year, the lake is gradually drawn down. These discharges continue during the autumn months, but typically, the reservoir levels begin to increase in early December as upstream releases begin to exceed Oahe discharges.

Recreation opportunities on Lake Oahe, especially motorized boating, fishing, and swimming, are affected by fluctuations in the amount of water flowing through the Missouri River system. During periods of above-normal rainfall in the Missouri River basin, Lake Oahe experiences a rise in surface elevation. This change in elevation may inundate some boat ramps and low-lying areas, making lake access difficult. High lake elevations also inundate areas of standing dead timber, making boating hazardous in some portions of the lake.

In the upper reaches of Lake Oahe, several areas are set aside for ORV use. During periods of low water, extensive stretches of shoreline are exposed and oftentimes receive heavy use. During high water elevations, these ORV areas are inundated forcing users to move to more unsuitable areas.

Drought conditions lower reservoir levels and, at times, make access to the lake difficult. Lower water levels also dry up many of the normally shallow areas of the lake, reducing the amount of area available for boat access and fishing. This is especially true in the northern end of the lake, and in many bays throughout the lake. In addition to decreasing the surface area of the reservoir, lower lake levels expose muddy and sometimes steep and eroded reservoir banks that are aesthetically unappealing and restrict water access for shoreline use. At times, water gap fences are rendered ineffective in controlling cattle. This sometimes results in livestock mortality or uncontrolled grazing of lakeshore areas.

Lower reservoir levels also have a detrimental effect on the recreation industry in general and on lakeside concessions in particular. These concessions provide services and supplies for both land-based and water-based recreation. During extended times of reduced lake elevations, the income of concessionaires may be substantially reduced because of the decrease in water-based recreation. In addition, the services normally rendered during periods of higher lake elevations (such as fuel sales, slip rental, and boat launching) may not be possible during low water levels.

EFFECTS OF OPERATIONS ON FISH AND WILDLIFE

The warmer waters near the surface of Lake Oahe aid in the development of a warm-water fishery. However, the fluctuation in the water level of the lake has a negative impact on maintaining fish and wildlife habitats. During the summer months, the lake experiences a gradual decline in elevation as tributary inflows decrease and evaporation increases.

During extended periods of low lake elevation, the amount of spawning habitat for various fish species decreases as the lake level is drawn down. Diminished inflows also make it more difficult to provide a steady or rising lake level during spring spawning. The low lake elevations expose many miles of shoreline in the upper reservoir and in the upper reaches of the Cheyenne, Moreau, Grand, and Cannonball River tributary arms. However, vegetation that establishes itself in these areas develops into excellent riparian habitat that is used extensively by deer and other wildlife species. The islands formed are used by Canada geese, nesting waterfowl and migratory waterfowl. Exposed areas of sandy shoreline are used by nesting least terns, piping plovers, and other shorebirds. As the lake is refilled, these areas are inundated and new fish spawning habitat and a new food base are created.

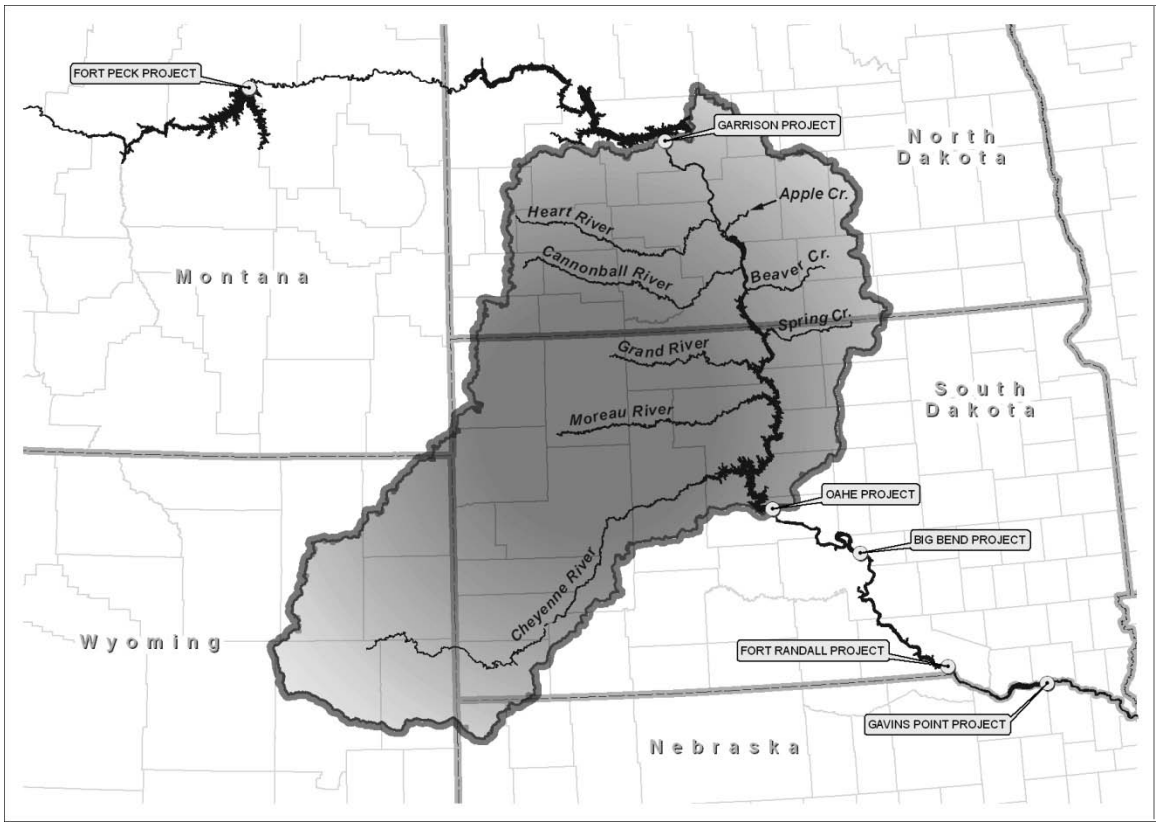
HYDROLOGY AND GROUNDWATER

HYDROLOGY

The drainage pattern of the Oahe Dam/Lake Oahe project is similar to the other Missouri River main stem projects. West of the Missouri River, the drainage pattern is generally well defined. However, to the east of the river, there are numerous depressions and portions of the region that do not contribute directly to stream flow unless substantial amounts of runoff occur.

The area of the upper Missouri River controlled by the Fort Peck and Garrison Dams controls three-fourths of the total drainage area contributing to Lake Oahe. This includes essentially all of the mountainous area contributing to the Missouri River upstream from Oahe Dam. This total drainage area consists of 243,490 square miles. Of this, Lake Oahe has a drainage area of 62,250 square miles. The Lake Oahe drainage area is shown on Figure 2-3.

Figure 2-3
Lake Oahe Drainage Areas



The dominant features of the Lake Oahe drainage area are the eight major rivers and creeks. The waterways drain approximately 44,000 square miles into the reservoir from the surrounding area. They include the Heart, Cannonball, and Grand Rivers draining the North Dakota Badlands in the west; the Moreau and Cheyenne Rivers draining western South Dakota; and the Apple, Beaver, and Spring Creeks draining the rolling hills and plains in the east. The primary source of runoff is the snowmelt accumulated during the winter months. However, excessive rainfall during May and June has resulted in substantial runoff on occasion.

For the period from 1967 through 2000, the average annual release from Lake Oahe equaled 18,453,000 acre-feet (ac-ft). This translates to an average daily flow rate of 25,500 cubic feet per second (c.f.s.). On a monthly basis, releases are varied according to power demands determined by weather conditions and

generally fall within the range of 15,000 to 30,000 c.f.s., with wider variations in daily release rates.

The elevation of the Missouri River declines approximately 205 feet between Bismarck and Oahe Dam, averaging about 0.9 feet per river mile. Tributary stream slopes are significantly steeper, averaging between 5 and 8 feet per mile. Tributary slopes tend to flatten toward the stream's mouth. Generally, the right-bank tributaries have comparatively narrow valleys and are entrenched roughly 100 to 150 feet below the surrounding uplands. The left-bank tributaries have substantially flatter slopes and, characteristically, have a lower quantity of runoff.

GROUNDWATER

Lake Oahe lies in a large and complex regional groundwater flow system that includes bedrock aquifers (layers of bedrock that hold groundwater), glacial drift aquifers (layers of rock material transported and deposited by a glacier that hold groundwater), and alluvial aquifers (clay, silt, sand, gravel, or similar detrital material deposited by running water that hold groundwater). The groundwater flow system is generally recharged by runoff (precipitation that flows over the land) and infiltration (precipitation that soaks into the ground).

Bedrock aquifers generally occur at depths greater than 2,500 feet and contain brackish or saline water. Major bedrock aquifers occur in the Fox Hills, Hell Creek, Cannonball and Ludlow, and Tongue River Formations. The Fox Hills aquifer, located in northwestern South Dakota, is the largest and most continuous bedrock aquifer in the area. Water from this aquifer is generally of a sodium bicarbonate or sodium bicarbonate-sulfate type and is suitable for domestic, livestock, and some industrial uses.

Glacial drift aquifers occur in layers of sand and gravel that were deposited by glaciers. Aquifers on the west side of Lake Oahe have the greatest potential for the development of large yields of groundwater. Dissolved solids and sodium concentrations often increase with depth and distance along the flow path. Water from glacial drift aquifers is suitable for domestic, livestock, and some industrial purposes. In some locations, yields are suitable for irrigation.

Alluvial aquifers are found in layers of sand and gravel that were deposited from rivers. Saturated sand and gravel intervals in these deposits have the potential for productive aquifers. However, because dissolved solids and sodium concentrations usually increase with depth and increasing distance along the flow path, groundwater quality is not suitable for all uses.

ICE AFFECTED FLOWS

Channel aggradation (the filling and raising of the level of a stream or river bed by sediment deposition) in Lake Sharpe and high water releases from Oahe Dam, coupled with the formation of river ice under severe winter conditions, have caused periodic winter flooding in the Pierre and Fort Pierre areas since 1979. The weather conditions preceding and during each ice event were severe, with temperatures of –

10°F to –20°F, usually accompanied by strong winds. The major source of the channel aggradation is the Bad River's heavy sediment flow into the Missouri River at Fort Pierre. Although aggradation results in increased stages throughout the year, the combination of aggradation and ice-affected flow conditions has dramatically increased the potential for flooding along the Pierre and Fort Pierre shorelines during the winter.

The peaking operation at the Oahe powerplant results in rapid fluctuations in water releases which cause rapid changes in river stages in the Pierre and Fort Pierre areas. During extremely cold periods when the head of ice is moving upstream, the rapid changes in river stage tend to break up the new ice cover and push it downstream, thus resulting in a thicker ice cover in the downstream areas. At the same time, frazil ice (ice that is made of ice crystals or granules, sometimes resembling slush, that is formed in turbulent water), which is being produced in the open-water reach upstream, clings to the underside of the downstream ice cover. As cold weather continues, the thickened ice cover eventually extends upstream until it reaches the area between the Pierre and Fort Pierre bridges. The additional roughness and flow reduction are caused by the thickened ice cover, which can then result in river stages from three to four feet higher than under open-flow conditions.

The resulting ice-affected condition causes minor flooding and storm sewer system backups, usually on the golf course and roads in the Stoeser Addition in Pierre and occasionally for the city water wells in Fort Pierre. To prevent flooding, the Corps reduces releases from Oahe Dam, preventing the Oahe powerplant from generating near capacity. This constraint on power generation comes at an unfortunate time because the same severe winter conditions that cause the ice-affected conditions also result in high demand for power generation. Because of its low elevation, Fort Pierre has the potential to experience a much greater level of ice-affected flooding than has been experienced in Pierre. Ice affected flows also affect the lands along the Cheyenne and Moreau Rivers causing intermittent flooding.

Each winter an ice cover can be expected to form in the Missouri River reach between Garrison Dam and the headwaters of Lake Oahe. Winter releases from Garrison Dam are carefully managed to reduce potential downstream impacts, and the flood potential has decreased significantly in this reach since the construction of the dam. However, the reach is still subject to ice jams and ice jam flooding. Ice induced floods can affect both the headwaters area of Lake Oahe and the upstream area including south Bismarck, General Sibley Park, Sibley Nature Trail, and Apple Creek Wildlife Area. There has been extensive flood plain development in and around the Bismarck area. Sediment deposition in the upper reaches of Lake Oahe can also contribute to potential flood conditions. The biggest threats to the Bismarck area are from ice jams forming on the Missouri River, in particular but not limited to, the area near its confluence with the Heart River located just downstream of Bismarck.

SEDIMENTATION

An important element to be considered in resource use planning at Lake Oahe is sedimentation. It

presents hazards to boaters, impairs fisheries, creates marshy areas, and jeopardizes recreation facilities. In addition to determining the useful life of the lake, sedimentation also increases the operation and maintenance costs of the project and can elevate the local water table. Many of these problems can be avoided by recognizing sedimentation phenomena, making an assessment of the rate and extent of future sedimentation, and planning recreational development with regard to the consequences of sedimentation.

The major sediments affecting Lake Oahe are: (a) watershed sediments transported and deposited by the tributaries entering the reservoir; (b) littoral drift that moves sediment along the shoreline through the action of wind and waves; and (c) shoreline banks eroded by forces such as wind, waves, precipitation, and freeze-thaw.

WATERSHED SEDIMENTS

During heavy precipitation, eroded soils are washed into tributary streams and carried into the reservoir. As stream velocity diminishes, the sediment drops out to form a delta. At the Missouri River tributary confluences of the Cheyenne, Moreau, Grand, and Cannonball Rivers, sediment deposition and delta formation have been significant.

Analysis of data collected from a hydrographic survey during 1989, the most recent data available on sedimentation, shows that sediment accumulation within the Lake Oahe pool currently has depleted 613,985 ac-ft of the original 23,750,945 ac-ft capacity of lake. This equates to a 2.6 percent (19,800 ac-ft) per year reduction in total storage since 1958.
In Lake Oahe, sediment accumulation has been greatest within the former river channel. At most of the tributaries, most notably the Cheyenne River, aggradation has progressed to the point where the former river channel has been completely filled in and a relatively planar bed has been created. These sediments, combined with fluctuating lake elevations, have also had an effect on private lands and wildlife.

Aggradation on the former floodplain areas is fairly uniformly distributed; however, the average depth of sediment deposition varies widely. In the immediate vicinity of the dam, sediment deposition has amounted to only one to two feet. Deposition depths increase fairly dramatically up to the Cheyenne River confluence about 30 miles northwest of the dam where sediment aggregation depths approach 20 feet, most of which has been deposited in the main channel. Between the Cheyenne River confluence and the upper end of the pool aggradation continues. Rather significant sediment deposition has occurred in the upper limits of Lake Oahe, as the relatively fast-flowing water entering the reservoir pool slows abruptly and drops its sediment load. Most of the deposits are in the former main river channel; however, the channel has generally been maintained through time.

LITTORAL DRIFT

Alongshore currents and wave action in the upper reaches of Lake Oahe transport fine sediments along the shoreline of the lake. As these transported sediments move along the shoreline, bars or shoals are formed across bays. These areas become a hazard to boaters by making the mouth of the bays shallow and difficult to navigate. Accumulation of littoral drift on boat ramps severely impairs the launching

capabilities. If not periodically removed, these sediments will bury a boat ramp, rendering it useless.

SHORELINE EROSION

Based on erosion studies performed in the late 1980s, approximately 2,800 acres of land had been lost at Lake Oahe since the completion of the project because of shoreline erosion. This equates to a loss of roughly 92 acres per year. When distributed along the total length of bank line, which exhibits erosion tendencies, the average rate of shoreline retreat is approximately 2 feet per year.

The rate and extent of erosion is determined by the nature of the shore materials; the energy of the oncoming waves as determined by wind velocity and direction; and the tendency of the eroded material to form beaches. Beaches break wave energy and tend to limit further erosion. However, if the bank is composed mostly of clay, the material is transported far offshore and does not form this natural protection. Under these conditions, erosion continues unabated. When erosion occurs close to recreation areas or encroaches on private land, it may necessitate shoreline protection measures, relocation of facilities, and/or purchase of additional lands.

The effects of sedimentation and shoreline erosion are considered when planning resource use and recreational development. For example, the consequences of future aggradation trends on proposed facilities are determined prior to their construction and the effects of littoral drift and sedimentation are considered when designing boat ramps.

SURFACE WATER QUALITY

FEDERAL CLEAN WATER ACT

In 1972, Congress enacted the first comprehensive national clean water legislation in response to growing public concern for serious and widespread water pollution. The Clean Water Act is the primary Federal law that protects our nation's waters, including lakes, rivers, wetlands, aquifers, and coastal areas. The Clean Water Act's primary objective is to restore and maintain the integrity of the nation's waters. This objective translates into two fundamental national goals: 1) eliminate the discharge of pollutants into the nation's waters, and 2) achieve water quality levels that are fishable and swimable. The Clean Water Act provides a comprehensive framework of standards, technical tools, and financial assistance to address the many causes of pollution and poor water quality, including municipal and industrial wastewater discharges, polluted runoff from urban and rural areas, and habitat destruction.

Among other things, the Clean Water Act requires the States and Tribes to establish water quality standards that appropriately protect waters within their jurisdiction. Executive Order 12088, "Federal Compliance with Pollution Control Standards", dated 13 October 1978, requires Federal facilities and activities to comply with applicable pollution control standards in the same manner as any non-Federal entity. To ensure project compliance, the Federal Facilities Compliance Act of 1990 provides for the Environmental Protection Agency (EPA) and/or States to inspect federally owned or federally operated

facilities that are subject to the Clean Water Act.

CORPS WATER QUALITY MANAGEMENT PROGRAM

The Corps water quality management program for civil works projects is described by the Corps' primary water quality regulation – Engineer Regulation (ER) 1110-2-8154, "Water Quality and Environmental Management for Corps Civil Works Projects." ER 1110-2-8154 was updated in 1995 to encourage a holistic, ecosystem approach to water quality management.

The diversity and magnitude of impacts that Corps projects and water management activities have on water quality are significant. The physical, chemical, and biological character of water is changed as it moves through Corps projects. Corps water control decisions determine if Corps projects have a positive or negative impact on water quality. The impacts of projects and their operation are often far-reaching, affecting the aquatic environment and its usefulness quite distant from the project.

As stewards of a significant percentage of the nation's aquatic environment, the Corps has a responsibility to preserve, protect, and where necessary, restore water quality altered by Corps projects. This requires a comprehensive understanding of the interactions of the uses and users of the aquatic environment and the impact of Corps structures and their operation on water quality. Understanding the physical, chemical, and biological processes that shape water quality conditions allows the Corps to operate, maintain, and modify projects in ways that provide for sustainable human uses while protecting, restoring, and conserving the environmental value of the aquatic resource. A continuing water quality-monitoring program is critical if the Corps is to understand and effectively manage aquatic resources at its projects.

GENERAL WATER QUALITY CONCERNS AT THE MISSOURI RIVER MAIN STEM PROJECTS

a. Lake Eutrophication - Reservoirs are commonly classified or grouped by trophic or nutrient status. The natural progression of lakes through time is from an oligotrophic (i.e., low nutrient/low productivity) through a mesotrophic (i.e., intermediate nutrient/intermediate productivity) to a eutrophic (i.e., high nutrient/high productivity) condition. The prefixes "ultra" and "hyper" are sometimes added to oligotrophic or eutrophic, respectively, as additional degrees of trophic status. The tendency toward the eutrophic or nutrient-rich status is common to all impounded waters. The eutrophication or enrichment process can adversely impact water quality conditions in lakes (e.g., increased occurrence of algal blooms, noxious odors, and fish kills; reduced water clarity; reduced hypolimnetic dissolved oxygen concentrations; etc.). Eutrophication of lakes can be accelerated by nutrient additions through other activities (e.g., point-source discharges and nonpoint sources such as runoff from cropland, livestock facilities, urban areas, etc.).

b. Hypolimnetic Dissolved Oxygen Depletion - As deeper, temperate lakes warm in the spring and summer they typically become thermally stratified because of the density differences of the water. These stratifications can be divided into three vertical zones: 1) epilimnion, 2) metalimnion, and 3) hypolimnion. The epilimnion is the upper zone of less dense, warmer water in the reservoir that remains

relatively mixed as a result of wind action and convection. The metalimnion is the middle zone that represents the transition from warm surface water to colder bottom water. The hypolimnion is the bottom zone of more dense, colder water that is relatively quiescent.

A significant water quality concern that can occur in reservoirs that thermally stratify in the summer is the depletion of dissolved oxygen levels in the hypolimnion. The depletion of dissolved oxygen is attributed to the differing density of water with temperature and the utilization of in-lake dissolved oxygen in the decomposition of organic matter. When density differences become significant, the deeper colder water is isolated from the surface and re-oxygenation from the atmosphere and the decomposition of organic matter can significantly reduce dissolved oxygen in the quiescent hypolimnetic zone. Anoxic conditions in the hypolimnion can result in the release of sediment bound substances (e.g., phosphorus, metals, sulfides, etc.) as the reduced conditions increase, and result in the production of toxic and caustic substances (e.g., hydrogen sulfide, etc.). Most fish, and other intolerant aquatic life, cannot inhabit water with less than 4 to 5 mg/l dissolved oxygen for extended periods. These conditions can impact aquatic life in the lake and also in waters downstream of the reservoir if its releases are from a bottom outlet.

c. Sedimentation - Sedimentation is a process that reduces the usefulness of reservoirs. In the design and construction of reservoirs, the Corps will commonly allow for additional volume to accommodate sedimentation. The inflowing sediment can seriously affect the reservoir ecology, fisheries, and benthic aquatic life. The reservoir can suffer ecological damage before a volume function such as flood control is impacted. The influx of sediment eliminates fish habitat, adds nutrients, destroys aesthetics, and decreases biodiversity.

d. Shoreline Erosion - Shoreline erosion is a major problem occurring on nearly all reservoirs located in areas of erodible soils such as the Midwest. The Omaha District alone has over 6,000 miles of reservoir shoreline of which 70 to 90 percent is eroding. Some locations have been protected, such as recreational and archaeological sites, but most of the shoreline continues to erode. Continued loss of the shoreline habitat (littoral zone) results in the loss of fish habitat as well as loss of habitat for other biota such as aquatic vegetation and benthic invertebrates.

e. Bioaccumulation of Contaminants in Aquatic Organisms - Bioaccumulation is the accumulation of contaminants in the tissue of organisms through any route, including respiration, ingestion, or direct contact with contaminated water or sediment. Bioavailability, for chemicals, is the state of being potentially available for biological uptake by an aquatic organism when that organism is processing or encountering a given environmental medium (e.g., the chemicals that can be extracted by the gills from the water as it passes through the respiratory cavity or the chemicals that are absorbed by internal membranes as the organism moves through or ingests sediment). In water, a chemical can exist in three different basic forms that affect availability to organisms: 1) dissolved, 2) sorbed to biotic or abiotic components and suspended in the water column or deposited on the bottom, and 3) incorporated (accumulated) into organisms. Bioconcentration is a process by which there is a net accumulation of a chemical directly from water into aquatic organisms resulting from simultaneous uptake (e.g., by gill or

epithelial tissue) and elimination. Biomagnification is the result of the process of biocentration and bioaccumulation by which tissue concentrations of bioaccumulated chemicals increase as the chemical passes up through two or more trophic levels. The term implies an efficient transfer of a chemical from food to consumer, so that residual concentrations increase systematically from one trophic level to the next.

Bioaccumulation of contaminants can have a direct effect on aquatic organisms. These effects can be chronic (reduced growth, fecundity, etc.) and acute (lethality). The bioaccumulation of contaminants can also be a concern to human health when the contaminated tissue of aquatic organisms is consumed by humans.

Fish are capable of accumulating many toxic substances in excess of 1,000 times the concentrations found in surface waters. The public has expressed concerns on whether fish caught from Corps project waters are safe to consume. Answers to public health concerns should be based on substantiated knowledge of toxicants in fish fillets and the public health risks associated with measured toxicant concentrations. This type of information can be used by states when considering the issuance of fish consumption advisories. The State of North Dakota has issued a statewide fish consumption advisory, which applies to the portion of Lake Oahe within the state, for mercury (NDDH 2003). No fish consumption advisories have been issued by South Dakota that apply to Lake Oahe (SDDH 2006). CRST also issues fish advisories when necessary.

DESIGNATED WATER QUALITY-DEPENDENT BENEFICIAL USES

Pursuant to the Federal Clean Water Act, the State of South Dakota has designated the following water quality-dependent beneficial uses to Lake Oahe and the Missouri River from Oahe Dam to Lake Sharpe: recreation (i.e., full immersion and limited contact), coldwater permanent fish life propagation, domestic water supply, agricultural water supply (i.e., irrigation and stock watering), commerce and industrial waters, and fish and wildlife propagation. The State of North Dakota has designated Lake Oahe as a Class 1 lake in the State's water quality standards. As such, the lake is to be suitable for the propagation and/or protection of a coldwater fishery (i.e., salmonid fishes and associated aquatic biota); swimming, boating, and other water recreation; irrigation; stock watering; wildlife; and for municipal or domestic use after appropriate treatment. Lake Oahe is used as a water supply by the town of Fort Yates, North Dakota, and the towns of Bear Creek, Blackfoot, Bridger, Cherry Creek, Dupree, Eagle Butte, Faith, Gettysburg, Green Grass, Iron Lightning, Lantry, LaPlante, Mobridge, Promise, Red Elm, Red Schaffold, Swiftbird, Thunder Butte, Wakpala, and White Horse, South Dakota, as well as some individual cabins.

Other water quality dependent uses include those of both a cultural and spiritual nature by members of both the Cheyenne River Sioux Tribe and the Standing Rock Sioux Tribe.

MANAGEMENT OF LAKE OAHE AS A "TWO-STORY" FISHERY

Lake Oahe currently maintains a "two-story" fishery in that the lake's fishery is comprised of warm, cool, and cold water species. The ability of the lake to maintain a "two-story" fishery is due to the lake's

thermal stratification in the summer into a colder bottom region (i.e., hypolimnion) and warmer surface region (i.e., epilimnion). Two coldwater species, Chinook salmon (Oncorhynchus tshawytscha) and rainbow smelt (Osmerus mordax), are important to the lake's recreational fishery. Chinook salmon are regularly stocked on a "put, grow, and take" basis and are a sought-after fish by anglers. Rainbow smelt are an important forage fish for warm and cold water sport fishes. As noted above, both North Dakota and South Dakota have designated a coldwater fishery use to Lake Oahe.

The depth at which water is withdrawn from a reservoir maintaining a "two-story" fishery can have a significant influence on the occurrence of cold water habitat in the impounded lake. Bottom withdrawal removes hypolimnetic water from the lake and may promote movement of interflows or underflows into the hypolimnion. Water discharged through Oahe Dam for power production is withdrawn from Lake Oahe at elevation 1540 feet m.s.l. – approximately 115 feet above the lake bottom.

Two water quality parameters, temperature and dissolved oxygen, are of prime importance regarding the maintenance of cold-water fishery habitat in Lake Oahe. During summer thermal stratification, only the hypolimnion possesses water temperatures supportive of coldwater habitat. The hypolimnetic volume of Lake Oahe is dependent on the pool elevation – the higher the pool elevation, the greater the hypolimnetic volume and coldwater habitat available. During summer thermal stratification, dissolved oxygen in the hypolimnion decreases as accumulated organic matter decomposes. Dissolved oxygen levels could potentially become limiting to coldwater habitat in Lake Oahe during the late summer if the oxygen demand could not be adequately assimilated by the lake's hypolimnion.

WATER QUALITY MONITORING AT THE OAHE PROJECT

The Corps has conducted water quality monitoring at the Oahe project since the 1970's. Water quality date collected by the Corps prior to 1999 are stored in the EPS's STORET Legacy Data Center and are available via the internet at "www.epa.gov/storet." Water quality data collected by the Corps after 1998 are stored at the Omaha District in an internal Corps database. Data can be obtained by contacting the Omaha District's Water Control and Water Quality Section. Making these data available in the future via the EPA's Modernized STORET web site is planned.

The Corps currently monitors ambient water quality conditions at the Oahe project at six locations (Table 2-2). Four sites on Lake Oahe are monitored monthly from May through September. Depth-profile measurements are taken and depth-discrete water quality samples are collected for laboratory analysis. Within the Oahe powerplant, water is withdrawn from the "raw water" supply line and routed through a flow chamber for continuous monitoring. A data logger within the flow chamber records hourly measurements year-round for water temperature, dissolved oxygen, and conductivity. Monthly samples are collected year-round for laboratory analysis. The inflow site on the Missouri River at Bismarck, North Dakota is monitored monthly from April through September.

Table 2-2
Ambient Water Quality Monitoring Locations at the Oahe Project

Station Number	Location	Latitude	Longitude
OAHLK1073A	Lake Oahe – Near Dam	44° 27’ 45.6”	100° 25’ 18.5”
OAHLK1110DW	Lake Oahe – Cheyenne River Area	44° 46’ 15.3”	100° 43’ 02.3”
OAHLK1153DW	Lake Oahe – Whitlocks Bay Area	45° 01’ 51.3”	100° 16’ 43.8”
OAHLK1196DW	Lake Oahe – Mobridge Area	45° 32’ 29.2”	100° 29’ 08.8”
OAHPP1	Oahe Powerplant	“Raw Water” Supply Line Oahe Dam	
OAHNFMORR1	Missouri River at Bismarck, ND	Interstate 94 Bridge Crossing (Bismarck, ND)	

The Corps recently completed an intensive water quality survey at the Oahe project. Seven in-lake deepwater sites, two inflow sites, and an outflow site in the Oahe powerplant were monitored over the 3-year period of 2005 through 2007. The seven in-lake sites are located along the old Missouri River channel from near Oahe Dam to the Mobridge area, and were approximately equally spaced along the 125-mile distance. The lake sites were monitored monthly from June through September, and included depth-profile measurements and collection of depth-discrete samples for laboratory analysis. Monthly inflow samples from May through September were collected from the Missouri River near Bismarck, North Dakota and the Cheyenne River near Eagle Butte, South Dakota. Water flowing out of Lake Oahe was monitored in the Oahe powerplant. Water quality conditions monitored during the 3-year intensive water quality survey are described in the Water Quality Special Report, “Water Quality Conditions

Monitored at the Corps’ Oahe project in South Dakota during the 3-year Period 2005 through 2007” (USACE 2008a)

Corps and sponsor-designated swimming beaches are sampled by State personnel for bacteria in accordance with State regulations. Any samples which exceed State standards require the closing of the beaches and retesting until the results fall within the regulations.

WATER QUALITY CONDITIONS MONITORED AT THE OAHE PROJECT

a. Existing Water Quality Conditions (2002 - 2005) - For assessment purposes, existing water quality conditions are defined as those conditions that were monitored during the previous 5 years (i.e., 2003-2007). Existing water quality conditions monitored at the Oahe project are described in the 2007 report, “Water Quality Conditions in the Missouri River Mainstem System” (USACE 2008b). This report discusses existing water quality conditions that were monitored in Lake Oahe, the Missouri River inflow to Lake Oahe, and at the Oahe powerplant (i.e., outflow from Lake Oahe). Existing water quality conditions monitored n Lake Oahe indicated possible water quality concerns regarding water temperature, dissolved oxygen, and pH for the support of coldwater permanent fish life propagation. Water temperatures in the epilimnion of the reservoir regularly exceed the water quality criterion form the

protection of coldwater permanent fish life propagation (i.e., 18.3^{o}C) in the summer, while temperatures in the hypolimnion do not. Dissolved oxygen levels in the hypolimnion continually degrade along the reservoir bottom as summer progresses and in late summer fall below the water quality criterion identified for the spawning season of 7 mg/l. Dissolved oxygen levels rarely fell below water quality criterion of 6 mg/l identified for the non-spawning season in the hypolimnion in the area of the reservoir near Oahe Dam. Dissolved oxygen concentrations regularly fall below 6 mg/l in the middle and upstream reaches of the hypolimnion. As the summer progresses, conditions of lower dissolved oxygen move up from the reservoir bottom into the deeper portions of the hypolimnion. The lowest dissolved oxygen concentration measured in Lake Oahe was 2.7 mg/l, and occurred near the reservoir bottom in the Swan Creek area on August 16, 2005. No measured pH values monitored in Lake Oahe were below the lower pH criterion of 6.6. The upper pH criterion of 8.6 was exceeded throughout the reservoir; however, no measured pH values were above 9.

A Trophic State Index (TSI) can be calculated as described by Carlson (1977). TSI values are determined from Secchi disk transparency, total phosphorus, and chlorophyll *a* measurements. Values for these three parameters are converted to an index number ranging from 0 to 100. The Omaha District uses the following criteria (Table 2-3) for determining lake trophic status from TSI values.

Table 2-3
Trophic Condition Criteria

TSI Value	Trophic Condition
0-35	Oligotrophic
36-50	Mesotrophic
51-55	Moderately Eutrophic
56-65	Eutrophic
66-100	Hypereutrophic

Existing trophic conditions were determined for Lake Oahe based on the monitoring conducted during the 3-year period 2005 through 2007. The average TSI values calculated for Lake Oahe during this period were 46 near Oahe Dam; 47 in the Cheyenne River area; 52 in the Whitlocks Bay area; and 58 in the Mobridge, SD area. The calculated TSI values indicate that the lacustrine zone (i.e. downstream reaches) of Lake Oahe is mesotrophic, the transition zone (i.e., middle reaches) is moderately eutrophic, and the riverine zone (i.e., upstream reaches) is eutrophic. However, it is noted that the calculated average TSI value for the riverine zone is greatly influenced by the lower water clarity in this part of the reservoir. This lower water clarity is largely attributed to suspended inorganic material delivered to the reservoir by the Missouri River. Thus, the higher TSI value in the riverine zone seemingly is not indicative of increased algal growth associated with nutrient enrichment.

Existing water quality conditions monitored in the inflow to Oahe Lake on the Missouri River at Bismarck, North Dakota indicated no major water quality concerns. Existing water quality conditions

monitored at the Oahe Dam powerplant indicated possible water quality concerns regarding temperature for the support of coldwater permanent fish life propagation. The State of South Dakota has designated the use of coldwater permanent fish life propagation to the Missouri River and Lake Sharpe downstream of Oahe Dam, and identified a maximum temperature criterion of 18.3°C to protect this use. Water passed through Oahe Dam in the summer regularly exceeds this temperature criterion. During the summer when Lake Oahe is thermally stratified, water temperatures in the epilimnion of the reservoir regularly exceed 18.3°C, while temperatures in the hypolimnion are less than 18.3°C. Water discharged through Oahe Dam for power production is withdrawn from Lake Oahe at elevation 1524 ft-msl, approximately 114 feet above the reservoir bottom. Thus, water withdrawn from the reservoir in the summer comes largely from the epilimnion, especially when pool elevations are lower due to drought conditions. Because water passed through Oahe Dam during the summer is withdrawn from the epilimnion of the reservoir, the temperature criterion of 18.3°C for the Missouri River and Big Bend Reservoir downstream of the dam are not being met during the summer.

b. Water Quality Trends (1980 - 2007) - Water quality trends over the 28-year period of 1980 through 2007 were determined for Lake Oahe for Secchi depth, total phosphorus, chlorophyll *a*, and TSI (USACE 2008b). The assessment was based on near-surface sampling of water quality conditions in the reservoir during the months of May through September at the near-dam, ambient monitoring site. It appears that the reservoir is experiencing slightly increasing concentrations of total phosphorus. There was no observed trend in transparency (i.e. Secchi depth) and chlorophyll *a*. Over the 28-year period, Lake Oahe in the area near the dam has generally remained in a mesotrophic state with calculated TSI values showing no observable trend.

FUTURE ACTIONS – WATER QUALITY MONITORING AND MANAGEMENT AT THE OAHE PROJECT

a. Water Quality Monitoring Goals and Objectives - The "Program Management Plan for Implementing the Omaha District's Water Quality Management Program" (USACE 2008c) identifies the purposes and objectives for water quality monitoring implemented by the Omaha District.

WATER QUALITY MANAGEMENT

a. Priority Water Quality Issues Identified by the Omaha District - The Omaha District has identified seven priority issues for water quality management (Table 2-4). All of these priority issues are relevant to the Oahe Project.

b. Application of the CE-QUAL-W2 Hydrodynamic and Water Quality Model - An early version (Version 2.0) of the "CE-QUAL-W2: A Two-Dimensional, Laterally Averaged, Hydrodynamic and Water Quality Model" was applied to the upper Missouri River Corps projects (i.e., Ft. Peck Lake, Lake Sakakawea, Lake Oahe, and Lake Francis Case) in the early 1990s. That application of the model was part of the efforts that led to the preparation of the Draft Environmental Impact

Table 2-4
Priority Water Quality Management Issues within the Omaha District

Ranking	Water Quality Management Issue
1	Determine how operation of the Missouri River Main Stem System dams affects water quality in the impounded reservoir and downstream river. Utilize the CE-QUAL-W2 hydrodynamic and water quality model to facilitate this effort.
2	Evaluate how eutrophication is progressing in the main stem system reservoirs, especially regarding the expansion of anoxic conditions in the hypolimnion during summer stratification.
3	Determine how the flow regimes, especially the release of water from main stem system projects, affect water quality in the Missouri River.
4	Provide water quality information to support Corps reservoir regulation elements for effective surface water quality and aquatic habitat management.
5	Provide water quality information and technical support to the Tribes and States in the development of their Section 303(d) lists and development and implementation of TMDLs at District projects.
6	Identify existing and potential water quality problems at District projects and develop and implement appropriate solutions.
7	Evaluate water quality conditions and trends at District project.

* 1 = Highest priority, 7 = Lowest Priority

Statement (DEIS) regarding the Master Water Control Manual Missouri River Review and Update. A discussion and results of that application of the model are included in the document, "Volume 7B: Environmental Studies, Reservoir Fisheries, Appendix C – Coldwater Habitat Model" (USACE 1994). The following summary and recommendations are taken from that report:

"Typically, dissolved oxygen (DO) is modeled along with a full suite of water quality variables including algal/nutrient interactions. Lack of available algal/nutrient data necessitated a different approach. DO was assumed to be a function of sediment and water column oxygen demands which were adjusted during calibration to reproduce the average DO depletion during summer stratification. The drawback to this approach is that operational changes which might affect algal/nutrient interactions cannot be predicted. This approach also precluded modeling algal blooms and die-offs during model calibration. Results from this study show only how physical factors relating to changes in reservoir stage and discharge affect DO."

"As a result, model predictions during scenario runs represent only how physical factors affect DO and do not include the effects of reservoir operations on algal/nutrient dynamics and their effects on DO. To include algal/nutrient effects would require at least one year's worth of detailed algal/nutrient data for each reservoir that were not and could not be made available during the time frame of this study."

"*Steps should be taken to obtain a suitable database that can be used to calibrate the entire suite of water quality algorithms in the model. It is almost a certainty that water quality issues will remain important in the future."*

The current version of the CE-QUAL-W2 model (Version 3.2) has incorporated numerous enhancements over the Version 2.0 model that was applied to the four Main stem System reservoirs in the early 1990's. These enhancements, among other things, include improvements to the numerical solution scheme, water quality algorithms, two-dimensional modeling of the water basin, code efficiencies, and user-model interface. Communication with the author of the past application of the Version 2.0 model to the main stem system reservoirs and current model support personnel indicated that the District should pursue implementing Version 3.2 of the model (personal communication, Thomas M. Cole, USACE/ERDC).

The Corps Engineer Regulation ER 1110-2-8154 states the following regarding water quality data application:

"Water quality data must be applied to understand and manage water resources effectively. Application of appropriate mathematical models promotes efficient and effective use of data. Models are powerful tools for guiding project operations, refining water quality sampling programs, planning project modifications, evaluating management scenarios, improving project benefits, and illuminating new or understanding complex phenomena. Models should be used to the maximum extent practicable."

As part of its Water Quality Management program, the Omaha District initiated the application of the CE-QUAL-W2 (Version 3.2) model to the Missouri River main stem reservoirs. The District is approaching the model application as an ongoing, iterative process. Data will be collected and the model run and continuously calibrated as new information is gathered. The goal is to have a fully functioning linked model in place for all the Missouri River main stem reservoirs that meets the uncertainty requirements of decision-makers.

PROJECT WATER QUALITY MANAGEMENT PLANNING

ER 1110-2-8154 requires that the Districts develop project-specific water quality management objectives. In approaching the development of project water quality management objectives for the Missouri River main stem projects, the Omaha District will base the plans largely on Project-Specific Reports developed for each of the projects. It is of paramount importance that the Project-Specific Reports reflect current water quality conditions and be updated prior to the development of a water quality management plan for the project. The tentative schedule for implementing these water quality management planning activities on the Missouri River main stem projects is given below (Table 2-5).

Table 2-5
Schedule for Water Quality Management Planning Activities
for the Main Stem System Projects

Planning Activity	Fort Peck	Garrison	Oahe	Big Bend	Fort Randall	Gavins Point	Missouri River*
Ambient water quality monitoring	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Conduct 3-year intensive water quality survey	Completed 2006	Completed 2005	Completed 2007	2008-2010	2006-2008	2008-2010	**
Prepare Water Quality Special Study Report (Findings of the 3-year intensive water quality survey)	Completed 2007	Completed 2006	2008	2011	2009	2011	2012
Application of CE-QUAL-W2 hydrodynamic and water quality model	2008	Ongoing-Initiated 2006	2009	2011	2010	2012	2013
Prepare Water Quality Special Study Report (Application of the CE-QUAL-W2 model)	2009	2008	2010	2012	2011	2013	2014
Prepare project-specific water quality report	2010	2009	2011	2011	2011	2014	2015
Develop project-specific water quality management objectives	2010	2009	2011	2013	2012	2014	2015

* Downstream from Gavins Point Dam

** Water quality date needs may be addressed with ongoing ambient water quality monitoring

ACCESSIBILITY

ROAD ACCESS

Lake Oahe is located in north-central South Dakota and south-central North Dakota between, Pierre, South Dakota, and Bismarck, North Dakota. Oahe Dam is located six miles north of Pierre, 115 miles south of Mobridge, South Dakota, and 215 miles south of Bismarck as shown on Figure 1-2.

In South Dakota, the major access point is Interstate 90. It is the only east/west interstate and is located

38 miles south of Oahe Dam and 158 miles south of Mobridge. In North Dakota, the main access point is Interstate 94 at Bismarck, the only east/west crossing of Lake Oahe in North Dakota.

The east side of Lake Oahe can be reached from either U.S. Highway 83 or State Highway 1804; both highways run between Bismarck and Pierre. Access to the west side of Lake Oahe varies by location - from Mandan to Fort Yates, North Dakota, on ND Highway 1806; from Fort Yates to McLaughlin on ND Highway 24; from McLaughlin to Mobridge on U.S. Highway 12; and from Mobridge to Fort Pierre/Pierre on SD Highways 20, 63, and U.S. Highway 14. These roads are good all-weather highways. The only east/west highways which provide access to both sides of Lake Oahe are U.S. Highway 12 at Mobridge, South Dakota and U.S. Highway 212 near Gettysburg, South Dakota. Access to project lands other than designated recreation areas can be difficult in some locations because of the lack of good secondary roads.

At the present time there is no way to cross the Missouri River for approximately 100 miles between Bismarck and Mobridge. Although a bridge has been proposed approximately midway between these two cities near the Fort Yates area, plans have yet to be developed (NDDOT 2006, SDDOT 2006).

RAIL ACCESS

East/west rail lines that cross the Missouri River and Lake Oahe are the Burlington Northern Railroad at Bismarck, the Chicago, Milwaukee and Pacific Railroad at Mobridge, and the Chicago and North Western Railroad at Pierre. A spur line of the Burlington Northern Railroad runs from Bismarck to Zeeland, North Dakota. These lines provide freight service near the lake project but not passenger service. The nearest AMTRAK passenger service is at Minot, North Dakota, 110 miles north of Bismarck.

AIR ACCESS

Both Northwest Airlines and United Airlines provide commercial air service to Pierre and Bismarck. Flights are scheduled throughout the day on small commuter aircraft. A small municipal airport is operated at Mobridge but there is no commercial service available.

Seaplane use of Lake Oahe is allowed if the rules, regulations, and restrictions contained in the Corps' Seaplane Landing Plan (Omaha District Pamphlet 1125-2-1) are followed. In addition, these aircraft must adhere to prescribed Federal, State, and local statutes. For the benefit of wildlife, Lake Oahe has specific areas that are closed to seaplanes between September 15 and December 31 each year.

LAKE NAVIGATION

Lake Oahe is classified as a navigable water of the United States. Although no commercial water travel exists on Lake Oahe, private recreational boats can navigate from the dam area near Pierre upstream to Bismarck on the Missouri River. Fuel and harbor accommodations are available at the southern end of the lake near Pierre and in the Mobridge area in South Dakota as well as in the Bismarck area in North Dakota. A few small private concessions along the lake sell fuel, both on and off project lands. Boat

operators are encouraged to participate in a Coast Guard-approved boat safety training course.

CLIMATE

Lake Oahe lies within North Dakota and South Dakota in the Great Plains region of the United States and Canada. The continental interior climate of the Great Plains is characterized by hot summers and cold, dry winters. Prolonged droughts of several years' duration and frequent shorter periods of deficient moisture, interspersed with periods of abundant precipitation, are characteristic of the Plains area.

TEMPERATURE

Because of its mid-continent location, the Great Plains region experiences widely fluctuating temperatures. Table 2-6 shows the wide fluctuations in temperatures at Bismarck, North Dakota, and Pierre, South Dakota respectively. Mean temperatures can range from 75°F during the summer to 10°F during mid-winter. Winters are long and cold but may be frequently interrupted by mild temperatures.

Table 2-6
Mean Maximum, Monthly, and Minimum Temperature* for Bismarck and Pierre
1970-2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Bismarck, ND													
Mean max.	21.1	28.5	40.2	55.9	69.1	77.8	84.5	83.3	71.6	58.2	38.2	25.7	54.5
Mean monthly	10.2	18.1	29.7	43.3	56	64.7	70.4	69	57.7	45.2	28	15.2	42.3
Mean min.	-0.6	7.8	19.1	30.6	42.8	51.6	56.4	54.7	43.7	32.1	17.8	4.8	20.1
Pierre, SD													
Mean max.	27.9	34.8	45.5	59.7	71.4	81.4	89.2	88	77.4	62.4	43.3	31.7	59.4
Mean monthly	17.8	24.5	34.7	47.2	58.9	68.7	75.5	74.1	63.2	49.7	33.3	21.9	47.5
Mean min.	7.7	14.1	23.8	34.7	46.3	55.9	61.8	60.1	49	37	23.3	12.1	35.5

* In degrees Fahrenheit

Summers are normally relatively mild, particularly in the higher elevations, but do have short periods of extremely warm temperatures. The warm summer temperatures lead to a demand for water-related recreation in the area.

The frost-free period averages 128 days from approximately May 10 to September 15. Late killing frosts in the spring and early autumn frosts occasionally occur. The period of ice cover averages 106 days from December 15 to April 1. The ice cover is usually continuous from Oahe Dam upstream to Bismarck near the Heart River. Ice fishing is popular at many locations. The relative humidity at the Oahe project areas

is fairly constant. Throughout the year, the average monthly humidity ranges between 60 and 70 percent.

Daily variances in humidity are common, ranging from 80 percent in the morning to 45 percent in the afternoon.

PRECIPITATION AND EVAPORATION

Annual precipitation at Lake Oahe is approximately 16 inches per year. The pattern of maximum, average, and minimum monthly precipitation at Bismarck and Pierre is shown in Table 2-7. Wide variations from average amounts may be experienced in any year, as seen by the extreme maximum and minimum values in these figures.

Precipitation over the region usually occurs as snow during the winter months of November through March and as rain during the remainder of the year. As seen in Table 2-7, May, June, and July are normally the wettest months of the year. Most rainfall occurs as showers or thunderstorms; however, steady rains lasting from several hours to a day or two may occur. Excessive rainfall over a relatively large area is unusual. More common are intense thunderstorms resulting in large amounts of rainfall in a short period of time over a very restricted area.

Table 2-7
Mean Precipitation Levels* for Bismarck and Pierre
1970-2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Bismarck, ND	0.45	0.51	0.85	1.46	2.22	2.59	2.58	2.15	1.61	1.28	0.7	0.44	16.84
Pierre, SD	0.52	0.54	1.19	2.02	3.14	3.49	2.75	1.86	1.55	1.64	0.7	0.48	19.88

* In inches Source: NCDC 2007a, b.

Snow usually accumulates at a slow rate. During the entire winter season about 36 inches of snowfall can usually be expected throughout the area. Over the Plains, snow does not usually accumulate throughout the winter season, but is melted by intense thaws. However, there have been notable exceptions when snow accumulations containing as much as six inches or more of runoff have blanketed large areas prior to a significant melt period. At higher elevations snow can accumulate through the winter and early spring season, peaking in March or early April. Snowfall through the Plains region is usually accompanied by high winds, resulting in much drifting.

Average annual gross evaporation from Lake Oahe is normally slightly less than 35 inches of lake depth per year. Because of the seasonal precipitation patterns and the lag in normal lake surface temperatures from corresponding air temperatures, nearly all of the annual evaporation for Lake Oahe can be expected to occur during the 6-month period of May through October.

WIND

The Lake Oahe area experiences average annual winds coming predominately from the north and northwest at 11 miles per hour (m.p.h.) with some seasonal differences. From September through April wind is generally from the northwest. Between April and August, wind is generally from the south and southeast.

Wind speeds are usually moderate at midday and almost calm at night. Strong winds exceeding 50 m.p.h. or more can occur during any month. High winds often accompany seasonal cold and warm air masses and summertime thunderstorms. Considerable damage is sometimes caused by straight-line thunderstorm winds.

Wind has a pronounced effect on project resources in several different ways. Wind plays an important role in shaping and creating shorelines. Although erosion from wind/wave action is a serious problem in some areas, wind also affects the comfort and safety of visitors, particularly when they are on or in the water.

TOPOGRAPHY, GEOLOGY, AND SOILS

TOPOGRAPHY

The States of North Dakota and South Dakota are part of two physiographic provinces, the Central Lowlands and the Great Plains, each of which occupies nearly half of these two States (Figures 2-4 and 2-5). Lake Oahe project lands are located within the northern Great Plains province. The Great Plains Province can be subdivided into the Coteau du Missouri (the glaciated) region and the Pierre Hills (the unglaciated) region. The Missouri River is the approximate separating line for these two areas.

The Coteau du Missouri region is generally found on the east side of Lake Oahe. During the Pleistocene Epoch, ice sheets moved southward over the project area's relatively soft bedrock formations, causing a heterogeneous mixture of rock materials to accumulate within the ice mass. When the ice mass melted and receded northward, a mantle of relatively unconsolidated sediments called glacial drift was left where the ice had been. The glaciated area was covered by at least one ice advance. Most of the glaciated areas are gently rolling, undulating plains and the relief is moderate. Gently rolling to steep glacial moraines (an accumulation of earth and stones carried and deposited by a glacier) are also seen in areas east of the lake. Drainages in the glaciated areas are generally poorly defined because of the rolling topography. Although there are few rivers, there is an abundance of lakes, ponds, and sloughs.

The Pierre Hills region is generally found on the west side of Lake Oahe. Most of the area is a dissected rolling plain. Upland (badlands) areas have a typically gently sloping to steep topography with a few scattered buttes. The buttes are located in the Porcupine Hills, Pamplin Hills, and other areas above 2,400 feet. Drainages in unglaciated areas were carved by running water eroding the soft, poorly cemented sands and clays of exposed rocks and are generally better defined than drainages in glaciated areas.

Terraces, buttes, and incised stream valleys are common.

Figure 2-4
Physiographic Divisions: North Dakota

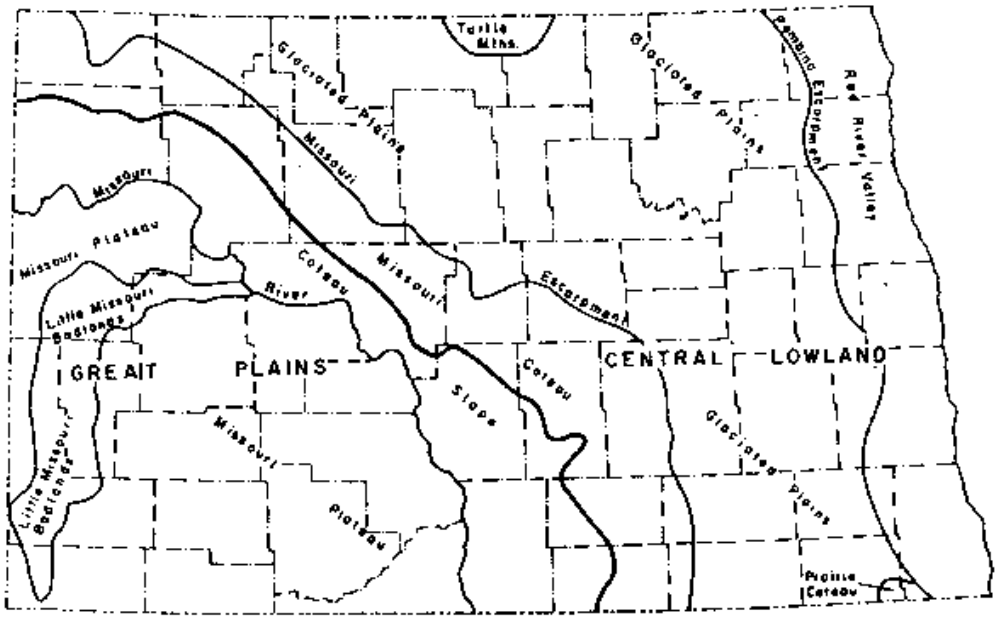
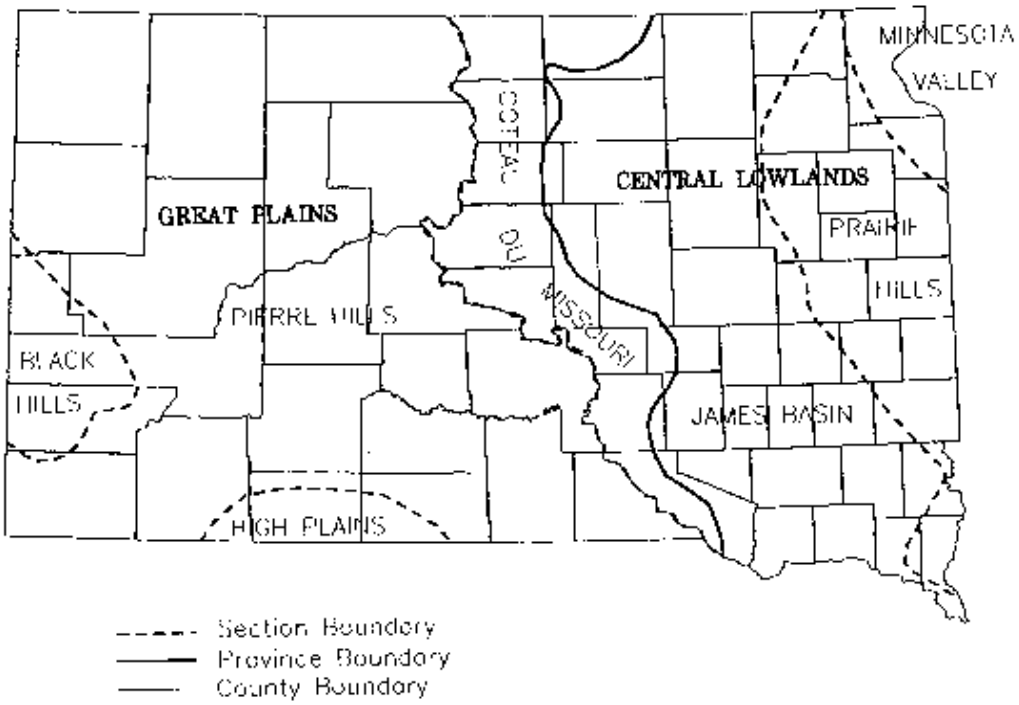


Figure 2-5
Physiographic Divisions: South Dakota



GEOLOGY

The bedrock surrounding Lake Oahe consists of nearly flat sedimentary rock ranging in origin from the Cretaceous to the Tertiary Periods. In general, older rocks are exposed in the southern part of Lake Oahe, near Pierre, and the younger rocks are exposed in the northern part, near Bismarck.

During Early Cretaceous time, most of the northern Great Plains region was slowly eroding. As the land subsided, a shallow sea developed. A uniformly sorted quartz sand was deposited along the sea's advancing shoreline. After the advance of the sea, thick beds of silt and clay accumulated in the deeper part of the sea basin; these beds are the Upper Cretaceous sediments and include the Pierre Shale. In Late Cretaceous time, mountain formation accompanied by some volcanic activity caused the land west of the sea to gradually rise. The uplift caused the sea to retreat southeastward and to become increasingly shallow. As shallowing progressed, near-shore sand was deposited that progressively covered the older clays.

Six dominant bedrock formations are present in the Lake Oahe project area. These are (in ascending order) the Dakota Sandstone, the Pierre Shale, the Fox Hills Sandstone, the Hell Creek Formation, the Cannonball and Ludlow Formations, and the Tongue River Formations
(Table 2-8).

The Dakota Sandstone is Early Cretaceous in age and is composed of a thin layer of mud, quartzose sand, and shale. The Dakota Formation is the most extensive artesian aquifer (a geologic formation in which water is under sufficient pressure to be discharged to the surface without pumping) in North Dakota and South Dakota.

The Pierre Shale Formation overlies the Dakota Formation and consists of gray marine clay, shale, and sandy shale. Zones of carbonaceous matter, veins of gypsum, bentonite layers, gray to brown hard sandy concretions, and occasional fossils are present in exposures.

The Fox Hills Sandstone overlies the Pierre Shale Formation and consists of very fine to medium sandstone, siltstone, and shale. A sandstone bed occurs at or near the top of the formation. It is very fossiliferous in places and often forms broad resistant benches or hilltops capped by resistant flaggy sandstone. This sandstone, which comprises about one-third of the formation thickness, is occasionally interbedded with thin lenses of siltstone and shale. The remaining two-thirds of the formation consists of a mix of siltstone and shale containing occasional fossil zones and limonitic concretions. In places, the lower portion of the formation contains a volcanic ash bed associated with very dense bentonite shale.

The Cannonball and Ludlow Formation overlies the Hell Creek Formation. This formation consists of interbedded very fine to medium sandstone, siltstone, claystone, and shale. Sandstone beds generally occur at three stratigraphic horizons. The most extensive is the middle bed, which contains large circular concretions. The sandstones are generally friable (easily crumbled), glauconitic, and noncalcareous,

Table 2-8
Geologic Time Scale and Corresponding Rock Formations

ERA	SYSTEM	SERIES	FORMATION	DESCRIPTION
CENOZOIC	QUATERNARY	RECENT (HOLOCENE)	Alluvium and Colluvium	Clay, light-gray, sandy and fine to coarse silty sand
		PLEISTOCENE	Glacial Drift: Till	Clay, gray to brown; fine to coarse sand, gravel, and shale pebbles
			Glacial Drift: Outwash Deposits	Gravel, fine to coarse, fine to coarse sand, gray
	TERTIARY	PALEOCENE	Tongue River Formation	Interbedded sand, silt, clay, lignite, and carbonaceous shales of non-marine origin
			Cannonball and Ludlow Formation	Interbedded very fine to medium sandstone, siltstone, claystone and shale
MESOZOIC	CRETACEOUS	UPPER CRETACEOUS	Hell Creek Formation	Shale, dark-brown, carbonaceous, fissile
			Fox Hills Sandstone	Clay, light-gray, sandy, and buff to brown coarse-grained platy calcareous sandstone
			Pierre Shale	Shale, gray; contains some thin bentonite beds and gypsum crystals
		LOWER CRETACEOUS	Dakota Sandstone	Sandstone, light gray, fine to coarse-grained, quartzose, and gray silty shale

except that the large concretions have a matrix of calcium carbonate cement. About two-thirds of the formation consists of siltstone, claystone, and shale. The siltstone and claystone are noncalcareous and contain abundant fossilized plant and carbonaceous material, mica flakes, and iron concretions. The shales are carbonaceous and, locally quite oily.

The Tongue River Formation overlies the Cannonball and Ludlow Formation. This formation is difficult to define. The Tongue River Formation consists of interbedded sand, silt, clay, lignite, and carbonaceous shales of non-marine origin deposited in swamps, lakes, streams, or floodplains of streams.

SOILS

Soil is produced by the action of soil-forming processes on parent material that was deposited or accumulated by geologic forces. The characteristics of the soil at any given point are determined by: (1) the physical and mineralogical composition of the parent material, (2) the climate under which the soil material accumulated and weathered, (3) the plant and animal life on and in the soil, (4) the relief or lay of the land, and (5) the length of time the forces of soil development have acted on the soil material.

Differences in these soil formation factors result in different soil characteristics. Soils that have similar profiles are classified by the Natural Resources Conservation Service (NRCS) as belonging to the same soil series. Two or more soil series are combined to form a soil association, which is a group of soils geographically associated in a characteristic pattern. The soil associations present at Lake Oahe are listed in Table 2-9.

Table 2-9
Soil Associations

Agar: silty loam to sand or shale, moderate erosion and moderate permeability. Cultivation for crops.

Agar-Lowry: silty loam, moderate erodibility, moderate permeability. Cultivation for crops.

Agar-Rhoades: silty loam with moderate permeability and erodibility. Pasture with some crops.

Agar-Vebar: silt with sandy loam, moderate erodibility, poor moderate permeability. Pasture and crops.

Bainville: silty loam, major erosion, poor to moderate permeability. Moderate pasture uses.

Bainville-Morton: silty loams with major erosion and very poor permeability. Used for pastureland.

Bainville-Morton-Rhoades: silty loams, moderate to major erosion and poor to minor permeability. Fair pastureland.

Bainville-Rhoades: silty loams, moderate to major erosion with poor to medium permeability. Fair pastureland.

Bowdle-Lehr: sand and gravel loam to clay loam, moderate to rapid permeability with moderate erodibility. Cultivated for crops.

Cheyenne: sandy loams with sand and gravel, moderate to rapid permeability with moderate erosion. Pasture and some cropland.

Farland: silty loam, moderate permeability, poor to moderate erodibility. Used for crops and pasture.

Farland-Wade: silty loams with saline clays, moderate erodibility and poor to moderate permeability. Used for natural grass and some pastureland.

Flasher: sandy loam to sand, moderate permeability and erodibility. Fair pastureland.

Flasher-Bainville: moderate erodibility with poor to moderate permeability. Excellent cropland or woodland.

Flasher-Bainville-Rhoades: silty loams with some sand, moderate to high erosion and poor to moderate permeability. Used for pasture.

Flasher-Vebar: loamy sand to sandy loam, moderate erosion and permeability. Used as natural grasslands.

Harriet: loamy clay over sandy loam, subject to floods, minor erosion and permeability. Used for native grass as well as a little cultivation.

Havre-Banks: silty loam to loamy sand, normally located in floodplain, low to moderate erosion, moderate to rapid permeability. Used for cultivated lands and supports tree growth.

Lehr-Wabek: loam over gravel loam, moderate erosion and permeability. Native grass with a little cultivation.

Lihen: sand, major erosion and rapid permeability. Primarily used for pastureland.

Linton-Mandan: silty loams, moderate erosion and permeability. Cultivation for crops.

Morton: silty loam, moderate erodibility and permeability. Used for pastureland and sometimes crops.

Morton-Agar: silty loams, moderate erodibility and permeability. Used for pastureland and sometimes crops.

Morton-Bainville: silty loams, moderate erodibility, poor to moderate permeability. Used for crop and pasture land.

Morton-Rhoades: silty clays, moderate erosion due to runoff, poor to moderate permeability. Normally cultivated land.

Morton-Vebar: silty loams with moderate erosion and rapid permeability. Used for crop and pasture land.

Oahe: sandy loam with moderate erosion and rapid permeability. Used for crop and pasture land.

Oahe-Sioux: loam to gravel loam, moderate to major erosion, with moderate to rapid permeability. Normally used for pastureland.

Parshall: sandy loam, moderate erodibility, rapid permeability. Used for pasture with some crops.

Parshall-Wade: sandy loam with some saline clay, moderate erodibility, moderate to rapid permeability. Normally used for pastureland.

Regent-Rhoades: silty loams to silty clays, moderate erosion with poor permeability. Normally used for pasture and cropland.

Rhoades: silty loams with moderate erosion and poor permeability. Normally used for pastureland.

Sansarc-Opal: clays with minor erosion and permeability with some major water runoff erosion. Used for grasslands.

Savage: silty clay, none to moderate erosion and poor to moderate permeability. Used normally for cultivated land.

Savage-Wade: silty loams to silty clays, moderate erosion and poor permeability. Normally used for pastureland and cultivation.

Straw-Havre: silty loam to sandy loam, also bottomland, moderate erodibility, poor to moderate permeability. Used for pastureland and some cultivation.

Trembles-Banks: sandy loams, moderate erodibility, and moderate to rapid permeability. Native grass and cultivated lands.

Valentine-Lihen: sandy lands, major erosion and rapid permeability.

Vebar: sandy loams, moderate erosion and moderate to rapid permeability. Used as pasturelands with some crops.

Wade: saline clays and flood lands with moderate erodibility and poor permeability. Some grasslands and some no-growth lands.

Wayden-Cabba: clays, high water erodibility with poor permeability. Used for native grasses.

Williams: clay loam, moderate erodibility with poor permeability. Used for croplands.

Williams-Parshall: clay loams to sandy loams, moderate erodibility with poor to moderate permeability. Used for pastureland and croplands.

Yecross-Tally: loamy sands with moderate erodibility and rapid permeability. Native grass growth with little cultivation.

Several general soil patterns are found in the vicinity of the Lake Oahe project area. The soils on terraces are nearly level to steep, shallow to deep, well drained, silty, clayey, and loamy soils.

The soils in upland areas, including sand-mantled uplands and upland swales, are nearly level to very steep, clayey, silty, and sandy soils underlain by bedrock. These soils are shallow to deep, well drained to somewhat excessively drained, medium textured, and moderately to strongly sloping.

The bottomland areas are nearly level, moderately well drained to somewhat excessively drained, fine to coarse textured soils. The soils on outwash plains generally are nearly level to rolling, well drained, and mostly moderately coarse textured. Dissected plains and plains areas generally are nearly level to steep, well drained, silty, loamy claypan, and loamy soils.

Soils found within the Lake Oahe project area vary in their suitability or limitations for particular uses. Potential problems posed by soils for a particular kind of development must be identified during the early planning stages so recreation areas, roads, structures, and other features can be properly sited. In addition, vegetative plantings can contain appropriate species and incorporate special planting techniques if needed. Detailed information on locations, characteristics, suitabilities, and limitations of specific mapping units within each soil series is included in each county's NRCS soil survey.

LAND USE

Prior to its purchase by the Corps, project lands were primarily used for farming and grazing. Portions of the timbered Missouri River bottoms were cut by local residents for firewood, rough lumber, and fence posts.

Today, agriculture still represents the primary use of the land bordering Lake Oahe. The remainder of the lands is devoted to recreation, wildlife, transportation, and urban areas. Woodlands are restricted to

bottomlands adjacent to streams and areas where trees have been planted.

The Dakotas are similar geographically, with fertile and humid river valleys to the east of the Missouri River and steadily increasing aridity and marginal ranch lands to the west. However, the two states differ somewhat in the commodities they produce and in the relative proportions of agricultural land that is cropland or pasture.

In North Dakota, 39.2 million acres, 89% of land in the state, is in agricultural production (USDA 2002). Of this agricultural land, 67.5% is used for cropland, 28.0% is used for pasture, and 4.6% is used for other purposes including cultural practices (USDA 2002). In 2005, the top five agricultural commodities in the state were wheat, cattle and calves, soybeans, corn, and sugar beets (Table 2-10).

Table 2-10
Top Five North Dakota Agricultural Commodities, 2005

Commodity	Value of receipts in thousand $	Percent of state total receipts	Percent of US value
1. Wheat	1,019,628	26.0	15.0
2. Cattle and calves	799,083	20.4	1.6
3. Soybeans	493,698	12.6	2.9
4. Corn	205,905	5.3	1.1
5. Sugar beets	191,417	4.9	17.3

Source: USDA 2006a

In South Dakota, 43.8 million acres, 89% of land in the state, is in agricultural production (USDA 2002). Of this agricultural land, 46.4% is used for cropland, 50.3% is used for pasture, and 3.3% is used for other purposes including cultural practices (USDA 2002). In 2005, the top five agricultural commodities in the state were cattle and calves, corn, soybeans, wheat, and hogs (Table 2-11).

Table 2-11
Top Five South Dakota Agricultural Commodities, 2005

Commodity	Value of Receipts in thousand $	Percent of State Total Receipts	Percent of U.S. Value
1. Cattle and calves	1,845,390	37.9	3.8
2. Corn	757,197	15.6	4.0
3. Soybeans	735,812	15.1	4.4
4. Wheat	446,284	9.2	6.6
5. Hogs	368,622	7.6	2.5

Source: USDA 2006b.

BORROW AREAS AND UTILITIES

The power transmission lines, supporting stations, and substations located in the area of the dam and powerhouse are the only major aboveground utilities on the Oahe project. A fiber optic telephone line running parallel to SD Highway 1804 does run on and off project lands.

Oahe Dam, which was completed in the early 1960s, was the largest rolled-earth dam in the world. The materials that were required for the construction of the dam were obtained from borrow areas around the project. Major borrow areas during the construction of the dam were located at the left abutment east of the powerhouse and northwest of the existing West Shore Recreation Area.

Only minor borrow areas are currently active on project lands. Both the Offroad Vehicle (ORV) area south of the dam and the area northwest of the West Shore Recreation Area are sometimes used as borrow areas when the amount needed is small. Large amounts that are necessary for project operations are purchased by contract.

One active sand and gravel mining area is located on Oahe project lands at Fort Yates, North Dakota. There is also a small amount of sand and gravel taken occasionally from the ORV area. Stanley County operates a sand and gravel operation off the project lands immediately south of the ORV area. The County has expanded to include the area to supplement the gravel placed on roads to recreation areas and wildlife areas.

VEGETATION RESOURCES

The native vegetation that is found on the Lake Oahe project varies widely. The different types of vegetative cover that occur around Lake Oahe project lands may be classified in the following types: (1) wetlands, (2) bottomland hardwoods, (3) shorelines, (4) woody draws, (5) grasslands, and (6) agricultural lands.

The project is located within the Great Plains dry steppe, or shortgrass prairie, ecoregion which is characterized by buffalograss (*Bouteloua dactyloides*), grama (*Bouteloua spp.*), wheatgrass (*Agropyron spp.*), needlegrass (*Stipa spp.*), and wildflowers such as blazingstar (*Liatris spp.*) and white prickly poppy (*Argemone albiflora*) (Bailey 1995). However, the east bank of Lake Oahe has a good number of tallgrass species in some areas, including little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), and big bluestem (*Andropogon gerardii*) on the better-managed and more mesic tracts.

On the steep clay shale soils, prickly pear cactus (*Opuntia spp.*), yucca (*Yucca spp.*), and sage (*Artemisia spp.*) are the commonly found species. Also found are significant amounts of big blue stem and little blue stem within the SRST reservation. Shrubs, woody plants, and trees are scarce on the lake, comprising

less than 5% of the total land area. Persistent heavy grazing by domestic livestock over the years has had dramatic impacts on all plant species along the lake.

WETLANDS

Several different types of wetlands occur on the Lake Oahe project. In the northern portion of the project, primarily in the reach north of Beaver Creek, remnants of the pre-dam Missouri River floodplain forest are either permanently flooded or temporarily under water because of the elevation of the lake. The understory of this now-dead forest consists of almost pure stands of cattail interspersed with reed canary grass (*Phalaris arundinacea*), rushes (*Juncus spp.*), and reed (*Phragmites spp.*). In conjunction with State and private entities, Ducks Unlimited has created a system of dams/dikes with control structures in the Little Heart Recreation Area and the McLean/Kimball Bottoms Recreation Area to manage water levels for waterfowl nesting and brood habitat. The wetlands at Little Heart Recreation Area are approximately 25-30 acres in size and the wetlands at McLean/Kimball Bottoms are approximately 60 acres in size. Both function well as long as there are adequate river flow releases. These wetlands provides many hours of public use. In the spring and early summer these areas are used to view wildlife and general landscapes. In the fall these unique areas are heavily used by hunters for both small and big game. Several wildlife water dams have also been created on Corps lands by the SRST for wildlife and cattle use.

The central and southern portions of the lake are characterized by smaller embayments and narrow drainages. These embayments have been severed from the main lake by littoral drift through the action of waves, wind, and ice. The result is that a number of these drainages have become isolated wetlands with only underground hydrologic connections. The size of these wetlands is usually very small, less than 1/2 acre to one acre. Lake Oahe's fluctuating water level, sometimes as much as 30 to 40 feet in several years, makes these wetlands along the shoreline and tributaries much more dynamic than naturally occurring wetlands. Man-made wetlands are also present in the southern portion of the lake. Two dams were place downstream of the spillway outlet to attract waterfowl and slow runoff that was causing erosion. A silt retention/waterfowl dam has also been constructed upstream from Government Bay.

Another wetland type that occurs in and along the narrow ribbon of Corps land is old livestock watering ponds. These small impoundments, often less than one surface acre, were usually constructed by damming a small drainage. Located on tracts of land that are no longer leased for agriculture grazing purposes, these ponds are very productive from an ecological standpoint. However, ponds that are located within an active grazing area are usually prone to the "waterhole effect," where livestock trample the entire shoreline to a barren state. Unfortunately, these ponds are biologically unproductive.

BOTTOMLAND HARDWOODS

Bottomland woodlands are riparian areas dominated largely by cottonwoods. These woodlands that remain on the Lake Oahe project occur in the upper portions of the major tributary drainages. In the North Dakota portion of Lake Oahe, the "river" stretch has the best-developed woodlands and continues to develop as sandbars are created. The woodlands in the upper drainages of the Cannonball, Grand,

Moureau, and Cheyenne Rivers continue developing as silt deposits proceed downstream from their headwaters.

Trees and shrubs also grow in smaller drainages and ravines. These areas receive more moisture than the uplands, contain some of the better soils, and produce better grasses, which in turn attract higher grazing pressures. When protected from grazing, the areas in these river basins drainages, ravines, or swales are the most productive woody resources on the lake.

SHORELINES

Lake Oahe's shoreline plant communities change with the lake's fluctuating water levels. Noxious weeds are a re-occurring problem on the shorelines of Lake Oahe. The reservoir is continually fluctuating, providing a prime area for noxious weeds to become established. During extremely dry years there can be as much as 200,000 acres of shoreline exposed. There is very limited access to the shoreline, making it extremely difficult to cost-effectively control noxious weeds. Lake Oahe harbors a wide variety of noxious weeds. Some of the most populated species are: Canadian thistle (*Cirsium cannabinum*), saltcedar (*Tamarix ramosissma*), leafy spurge (*Euphorbia marginata*), absinth wormwood (*Artemisia absinthium*), bull thistle (*Cirsium vulgare*), Russian knapweed (*Centaurea repens*), perennial sowthistle (*Sonchus arvensis*), common cocklebur (*Xanthium strumarium*), field bindweed (*Convolvulus arvensis*), yellow toadflax (*Linaria vulgaris*), and buffalobur (*Solanum rostratum*).

Additional vegetation, including trees, grows during consecutive years of declining water. Cottonwoods (*Populus deltoides*), willows (*Salix spp.*), green ash (*Fraxinus pennsylvanica*), and Russian olive (*Elaeagnus angustifolia*) set root and grow. Conversely, a gradual rise or lowering in water levels over consecutive years inundates or terminates the thriving shoreline ecosystem. As a general rule, multiple years of higher water elevations that destroy vegetation are excellent for the fisheries resource. Consecutive years with progressively lower water levels dramatically increases the growth of shoreline vegetation, including trees, and results in an increase in upland game, migratory birds, and big game populations.

WOODY DRAWS

There are very few native woodlands on Lake Oahe project lands. Remnants of the pre-dam Missouri River cottonwood forest are found on the lake from Bismarck downstream to just north of Beaver Creek. The bur oak (*Quercus macrocarpa*), green ash, American elm (*Ulmus americana*) complex that was the fringe of the old riverine system can still be found in the upper stretch of the tributaries on Lake Oahe.

The native tree resource that remains above the maximum normal operating pool of elevation 1617 m.s.l. is normally found on east- and north-facing slopes. Between 1990 and 1992, the U.S. Forest Service Rocky Mountain Forest and Range Experiment Station conducted a study of small mammals associated with four prairie woodlands near the Missouri River between Mobridge and Fort Thompson, South Dakota, which includes portions of Lake Oahe and Lake Sharpe (Rumble and Gobeille 2001). This study divided the lakes' woodland communities into the following four generalized types.

- Green Ash - Green ash communities occur in the upland drainages where soil moisture conditions are more favorable for tree growth. In these areas, green ash is dominant with box elder and American elm trees found in association. Green ash is common in established stands of cottonwood in the absence of flooding. The perimeter of these stands is usually made up of plum (*Prunus americana*), chokecherry (*Prunus virginiana*), snowberry (*Symphoricarpos occidenatlis*), and on the higher elevation edges, skunk bush (*Rhus triloabata*) and cedar/juniper (*Juniperus virginiana*).

- Cottonwood - The plains cottonwood was very abundant along the Missouri River bottoms prior to inundation by Lake Oahe. The majority is now gone and the potential to replace it along the newly created lake is virtually impossible. The remaining soils and variable hydrology are not conducive to cottonwood growth or regeneration. Minimal stands occur along the floodplain and in the tributaries of Lake Oahe. The cottonwoods present vary from seedlings on the recently flooded banks and sandbars, to dense sapling stands co-existing with willow in the tributaries, to open flats at or above ordinary high water that contain few large trees to young seedlings in the delta areas. In the early 1990's, a study was conducted on the riparian forests along the Missouri River between Oahe Reservoir and Garrison Dam, which includes the delta area of Lake Oahe near Bismarck, North Dakota. The study predicted a future decline in the areal extent of pioneer forests (which include cottonwoods and willows) as a result of river regulation. Colonization of cottonwoods on the lake's shoreline occurs rather routinely but only in small isolated areas. However, many of these stands succumb to the significant water level fluctuations. The declining cottonwood forests are succeeding to green ash, Russian olive, and juniper.

- Juniper/Cedar - Juniper/Cedar communities exist in only scattered stands in the Missouri River basin on Lake Oahe. Rocky Mountain juniper (*Juniperus scopulorum*) is at its most easterly range and has somewhat hybridized with the eastern red cedar. Rocky mountain juniper is found predominantly on the southern end of the lake in old field situations and shelterbelts. Rocky mountain juniper is spreading through the lowland forests as a succssional species to willow and cottonwood. Stands frequently occur in steep, rugged, and highly erodible terrain near the lake. Larger trees are in areas that have been spared from prairie fires and woodcutters. Areas lacking heavy grazing pressure show the aggressive nature of this species. A unique feature of the juniper/cedar woodland type is that little-seed rice grass (*Piptatherum micranthum*) is largely restricted only to these stands in this region.

Juniper/cedar draws are usually observed on the west bank of Lake Oahe and are very limited on the east. Since grazing has been eliminated on the Little Bend Peninsula, a dramatic increase in juniper/cedar plum, chokecherry, skunk bush sumac, and snowberry has been noted by project staff.

- Bur Oak - Bur oak communities are very similar to the green ash type except that oak is most dominant; however, stands of oak are widely scattered. Because bur oak is very near, if not at, the western limits of its range, stands are not common. The understory of the few oak stands consists of minimal chokecherry, skunk bush sumac, and snowberry.

For the past 30 years, the Oahe project has been intensively involved with the SDGFP to establish and

enhance vegetative, tree, and shrub resources on Lake Oahe within the State of South Dakota. In the 1980s, many hundreds of acres of food plots, dense nesting cover, warm and cool season grass plantings, and over a million trees have been established through various contracts with the SDGFP. These plantings were concentrated in the Pierre and Mobridge areas of the project.

Under Title VI (P.L. 106-53) legislation the SDGFP established a trust fund for the continued financial support of their wildlife mitigation program. Since all Corps lands above elevation 1620 m.s.l. were transferred to the State of South Dakota, a portion of the trust fund will be used to develop and maintain these mitigation plantings. Upon capitalization of the trust fund the Corps will have fulfilled its mitigation requirements under the 1958 Fish and Wildlife Coordination Act.

GRASSLANDS

Long-term erosion has extensively changed the natural landscape of the river breaks. Steep to excessively steep (16 to 45 percent) rangeland is positioned below the tablelands and above the shoreline of Lake Oahe. A large portion of these fragile rangelands now exists in a damaged condition that continues to degrade under present grazing management techniques. To date, there are no proven, economically acceptable methods that would reduce erosion and sedimentation on these lands. Standard methods of erosion control on rangeland are expensive, usually unacceptable to the land users, and generally do not treat the problem of rangeland deterioration and water conservation. However, plantings in the upper portions of the western tributaries do help cut down on erosion in those areas.

Areas along Lake Oahe's west bank are dominated by shale soils that have low infiltration rates and consequently are highly erosive. Land use has been and will likely remain grazing of native grasslands. Glacial till soils are more abundant on the east bank. Principle climax grass communities consist of a mix of warm and cool season tall- and mid-grass species. Heavy clay soils usually support a predominance of western wheatgrass (*Pascopyrum smithii*) and green needlegrass (*Nassella viridula*), both of which are mid-height species and occur with blue grama (*Bouteloua gracilis*), buffalograss, and some sideoats grama as secondary species. Tallgrass species such as little bluestem, big bluestem, needle-and-thread (*Hesperostipa comata*), Indian grass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*) are more common within either draws or low terraces where the more fertile soils are found. In the wetter drainages good stands of prairie cordgrass (*Spartina pectinata*) can be found. In many areas of the lake, heavy grazing pressure has shifted the plant communities towards short grass species, annual weedy forbs, sedges, and bare ground, which are ecologically inferior to the tall- and mid-grass species originally found on these soils.

Grazing is a tool used to manage the grassland for wildlife and other authorized uses. Overuse of the resource can and has led to the overgrazing of the grasslands which is not conducive to the adjacent rancher and resource. Native grassland increasers and decreasers and noxious weeds should be monitored and grazing dates adjusted to improve the native grasslands into a sustainable condition. This tool is critical and needs to be utilized properly by partnering with the adjacent landowners, wildlife agencies, weed boards and COE.

AGRICULTURAL LANDS

Some prime agricultural land was acquired for the Lake Oahe project. Although these small tracts make up less than one percent of the total project area, they are very productive for wildlife when converted to tree cover plantings and/or annual food plots. Agricultural lands adjoining project lands are found mostly on the east bank. Center pivot irrigation systems are often used to make this land arable. Little project land is being leased for dry land farming.

FISH AND WILDLIFE RESOURCES

FISHERIES

Prior to the impoundment of Lake Oahe, the Missouri River fisheries community consisted basically of warmwater fish. After impoundment the northern pike (*Esox lucius*) and panfish populations increased tremendously as the reservoir filled. As the reservoir matured, walleye (*Sander vitreus*), a coolwater species, emerged as the dominant species.

After Lake Oahe filled, a deep cold water habitat was created, allowing a cold water fishery to be developed. The SDGFP initiated a stocking program to fill the vast cold waters of Lake Oahe. Some of the more common species stocked in Lake Oahe to fill this niche were Chinook salmon, rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), lake trout (*Salvelinus namaycush*), lake whitefish (*Coregonus clupeaformis*), lake herring (*Coregonus artedii*), and kokanee salmon (*Oncorhynchus nerka*). CRST also had a program to stock walleye into Lake Oahe in the early 1990's; however this program has been discontinued. Rainbow smelt, stocked by North Dakota, became the prime food base for the coldwater fishery that presently exists in the lake. Smallmouth bass (*Micropterus dolomieu*) and spottail shiners (*Notropis hudsonius*) are two of the more successful warm water fish species that have been stocked. Throughout most of the 1980s and 1990s the SDGFP annually stocked walleye fry and fingerlings, Chinook salmon, and rainbow trout (Table 2-12).

Currently all trout stockings have ceased as have supplemental stockings of walleye. The only fish being stocked by SDGFP in Lake Oahe at present is the Chinook salmon. The NDGF no longer stocks the North Dakota portion of Lake Oahe, but manages, instead, purely on reproduction. NDGF has stocked some fish, particularly northern pike from 1957 through 1993 (Table 2-13).

The Oahe reservoir changed a large portion of the riverine habitats of the Missouri River. The primary changes in this reach include: reduced turbidity, lowered temperatures, altered flows, reduced sediment loads, and reduced main channel with corresponding losses of shallow water and backwater habitat. Fish migrations have been affected, which has impacted the population levels and distribution of spawning areas for many species. Movement of native species like the sturgeon and paddlefish has been severely impacted. Those species that continue to exist in this river section have become very isolated. Most native species found in the original Missouri River have declined because of the habitat changes from a riverine to a lacustrine environment.

Table 2-12
Numbers of Coldwater Fish Stocked by SDGFP in Lake Oahe

Year	Brown Trout	Chinook Salmon	Lake Trout	Rainbow Trout	Lake Herring
1982	-----	292,150	2,745	101,470	-----
1983	-----	790,150	7,779	131,395	-----
1984	18,000	784,550	8,560	279,395	470,000
1985	69,000	845,542	4,750	85,635	-----
1986	52,900	811,665	-----	146,229	-----
1987	93,700	1,005,054	-----	50,000	-----
1988	77,167	1,061,535	-----	41,270	200
1989	50,000	217,037	-----	19,150	-----
1990	50,500	66,385	-----	32,370	9,388,500
1991	-----	249,478	-----	18,410	10,995,500
1992	-----	219,000	-----	27,190	11,416,000
1993	-----	275,055	-----	74,707	-----
1994	-----	298,759	-----	81,365	-----
1995	-----	363,787	-----	96,002	-----
1996	-----	418,478	-----	145,659	-----
1997	-----	396,660	-----	118,958	-----
1998	-----	234,101	-----	131,245	-----
1999	-----	104,976	-----	213,506	-----
2000	-----	49,494	-----	101,021	-----
2001	-----	-----	-----	-----	-----
2002	-----	-----	-----	-----	-----
2003	-----	17,259	-----	-----	-----
2004	-----	173,079	-----	-----	-----
2005	-----	119,363	-----	-----	-----
2006	-----	119,363	-----	-----	-----
2007	-----	166,985	-----	-----	-----
Total	411,267	9,082,356	23,834	1,894,977	32,270,200
Average	58,752	378,432	5,959	99,736	6,454,040

Source: SDGFP 2007a

Lake Oahe is an extremely valuable fisheries resource for the state of South Dakota, annually supporting between 99,000 and 338,000 angler trips. The Lake Oahe fishery had an estimated economic value of over $25 million for the April-October 1996 daylight period, based on information provided by the United States Census Bureau. In 2005, approximately 99,000 angler trips occurred on Lake Oahe for an estimated economic value of $6 million (U.S. Dept. of Interior, Fish and Wildlife Service, and U.S. Dept. of Commerce, Bureau of the Census). Because of the importance of Lake Oahe fisheries resources, they must be effectively managed to produce optimal recreational benefits.

WATERFOWL AND OTHER WATER-DEPENDENT BIRDS

Lake Oahe lies within the central flyway and is a corridor for massive spring and fall migrations of waterfowl. Sandhill cranes (*Grus canadensis*), Canada geese (*Branta canadensis*), white-fronted geese (*Anser albifrons*), snow geese (*Chen caerulescens*), and mallard ducks (*Anas platyrhynchos*) are the most

Table 2-13
Numbers of Fish Stocked by NDGF in Lake Oahe
1957-1993

Year	Northern Pike	Rainbow Trout	Walleye	Paddlefish
1957	35,000	-----	-----	-----
1958	40,000	-----	-----	-----
1967	1,050,672	-----	-----	-----
1968	2,360,000	-----	-----	-----
1970	143,790	-----	-----	-----
1971	4,741,200	-----	-----	-----
1975	60,000	-----	-----	-----
1978	3,942,000	-----	-----	-----
1979	2,982,600	50,000	-----	-----
1981	-----	-----	1,723,250	-----
1986	1,500,000	-----	-----	1,620
1992	107,544	-----	-----	-----
1993	850,000	-----	-----	-----

Source: NDGF 2006a

common migrating species. American bitterns (*Botaurus lentiginosus*), cormorants (*Phalacrocorax auritus*), white pelicans (*Pelecanus onocrotalus*), and great blue herons (*Ardea herodias*) are other large waterbirds that also frequent Lake Oahe.

Many aquatic birds use Lake Oahe's open waters, shorelines, marshes, and mud flats as either home or a migration route to a summer range. These species include gulls (*Larus spp*.), great blue (*Ardea herodias*) and little blue (*Egretta caerulea*) herons, American coots (*Fulica americana*), Virginia rails (*Rallus limicola*), yellow rails (*Coturnicops noveboracensis*), American bitterns (*Botaurus lentignosus*), least bitterns (*Ixobrychus exilis*), sandpipers (*Tringa* and *Limosa spp*.), terns (*Sterna spp*.), bank swallows (*Riparia riparia*), red-winged blackbirds (*Agelaius phoenicus*), wood ducks (*Aix sponsa*), blue-winged teal (*Anas discors*), belted kingfishers (*Ceryle alcyon*), and many others.

High densities of waterfowl along the lake in the fall, especially between Gettysburg, and Pierre, South Dakota, and at the mouth of the Cheyenne River, provide excellent waterfowl hunting. Consistently 200,000 to 300,000 ducks and geese migrate through the lower Lake Oahe region between early November and early January (SDGFP 2006a). Major areas that hold these concentrations of waterfowl are: Whitlocks area, Sutton Bay, Little Bend, Mail Shack, Okobojo Creek, Spring-Cow Creek, Chantier Creek, Twin Bays, Peoria Flats, and Government Bay. Of these areas, the most heavily used and popular are Mail Shack, Okobojo Creek, and Peoria Flats. It is not unusual for over 100,000 Canada geese and a multitude of ducks to overwinter in the southern end of Lake Oahe and the northern end of Lake Sharpe.

In the northern Lake Oahe region, areas that hold high concentrations of waterfowl include the Little Heart Recreation Area and the McLean/Kimball Bottoms Recreation Area.

There are 13 designated State waterfowl refuges in South Dakota along Lake Oahe. These vary from waterline refuges (those running from the water's edge on one side of the lake to the other side) to takeline refuges (those encompassing project lands and the lake). The refuges are "no waterfowl hunting" areas that function as resting areas for waterfowl. In North Dakota, there are five State-designated wildlife management areas located in the immediate vicinity of Lake Oahe plus numerous other wildlife management areas located in adjacent counties. However, there are no waterfowl rest areas in the vicinity of Lake Oahe.

The cropland adjacent to Lake Oahe consists of irrigated corn and soybeans along with many acres of dryland winter wheat. The combination of grain and corn stubble and newly emerged winter wheat provides plenty of food for geese, cranes, and ducks. Many hunting camps or lodges have developed along the river because of migrating or overwintering ducks and geese. Fee hunting, from field pits over decoys to over-water decoy hunting, is a very large business on Lake Oahe from Gettysburg south to Pierre. The State of South Dakota annually issues approximately 4,326 non-resident waterfowl licenses (SDGFP 2006a), many of which are for hunting on Lake Oahe. Waterfowl hunting generates significant revenue for the cities near the southern portion of Lake Oahe.

OTHER BIRDS

Many other birds use the project for multiple purposes such as mating, nesting, migrating, loafing, and foraging for food. Oahe's woody draws and remnant riverine forest stands are the most valuable habitats. Although these habitats make up less than 3 percent of the land mass, they are used by a high proportion of birds throughout the year. Birds that are year-round residents find these habitats especially valuable for shelter in the winter.

Researchers from the U.S. Forest Service Rocky Mountain Forest and Range Experiment Station studied the bird community along the Missouri River in central South Dakota from 1990-1992 (Rumble and Gobeille 2004). They found that older cottonwood woodlands are especially valuable to birds. Total bird abundance, species diversity, species richness, richness of woodland obligates (species that are almost always found in woodlands), abundance of tree-nesting species, abundance of cavity-nesting species, and abundance of shrub-nesting species were greater in late and late intermediate cottonwood stands.

In addition, the adjoining croplands and grasslands are used by species such as a variety of sparrows (*Spizella spp*.), American robins (*Turdus migratorius*), brown thrashers (*Toxostoma rufum*), flycatchers (*Empidonax spp*.), rose-breasted grosbeaks (*Pheucticus ludovicianus*), warblers (*Dendroica* and *Geothlypis spp*.), indigo buntings (*Passerina cyanea*), and meadowlarks (*Sturnella spp*.). Native prairies along Lake Oahe are home to several ground-nesting species of birds. The more common birds in this group are bobolinks (*Dolichonyx oryzivorus*), western meadowlarks (*Sturnella neglecta*), upland sandpipers (*Bartramia longicauda*), lark buntings (*Calamospiza melanocorys*), long-billed curlews

(*Numenius americanus*), McCown's longspurs (*Calcarius mccownii*), and burrowing owls (*Athene cunicularia*).

Birds of prey are also year-round residents and migrants on the project. Larger birds include turkey vultures (*Cathartes aura*), golden eagles (*Aquila chrysaetos*), bald eagles (*Haliaeetus leucocephalus*), great horned owls (*Bubo virginianus*), and various hawks (*Buteo* and *Accipiter spp*.). Smaller birds of prey also found on the project lands include the osprey (*Pandion haliaetus*), prairie falcon (*Falco mexicanus*), nighthawk (*Chordeiles minor*), and short-eared owl (*Asio flammeus*).

Upland game birds were significantly impacted by the loss of woody habitat when Lake Oahe was impounded. Populations of wild turkeys (*Meleagris gallopavo*), sharp-tailed grouse (*Tympanuchus phasianellus*), prairie chickens (*Tympanuchus cupido*), ring-necked pheasants (*Phasianus colchicus*), Gray partridges (*Perdix perdix*), and mourning doves (*Zenaida macroura*) have declined since the reservoir was created. Wild turkeys are found in the downstream area; the Moreau, Grand, Cheyenne, and Cannonball River drainages; McClean Bottoms; Kimball Bottoms; Beaver Creek; and Badger Bay. Pheasants and partridge are found in areas on both sides of the lake that have suitable habitat usually adjacent to agricultural cropland. The sharp-tailed grouse species is found most often on the rangeland portions of the project with higher populations occurring on the west bank in South Dakota and both the east and west banks in North Dakota

MAMMALS

The mammals found in the Lake Oahe region include big game and small game species, various furbearers, and numerous rodents.

Big game species on Lake Oahe project lands are limited to mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), and wild turkey. (South Dakota considers turkey big game, while in North Dakota it is considered an upland species.) Deer populations on the Oahe project have gradually risen because of county deer management and the replacement of pastureland with irrigated cropland. In successive years of lower water, the habitat created on the exposed shorelines, mud flats, and peninsulas is especially beneficial to the deer herds.

Although pronghorn existed on project lands prior to inundation, they did not use the old Missouri River trench. Today, the limited pronghorns that are found on project lands are only incidental visitors. Oahe project land occupies only a small portion of the pronghorn's grassland habitat.

Furbearers and large predators found on Lake Oahe include coyotes (*Canis latrans*), bobcats (*Lynx rufus*), red foxes (*Vulpes vulpes*), badgers (*Taxidea taxus*), skunks (*Mephitis mephitis*), raccoons (*Procyon lotor*), beavers (*Castor canadnesis*), mink (*Mustela vison*), muskrats (*Ondatra zibethicus*), and weasels (*Mustela nivalis*). Small game mammals include eastern cottontails (*Sylvilagus floridanus*), white-tailed jackrabbits (*Lepus townsendii*), and fox squirrels (*Sciurus niger*).

A small number of porcupines (*Erethizon dorsatum*) live in the bottomland hardwoods along the tributaries to the lake. Black-tailed prairie dogs (*Cynomys ludovicianus*) are a common sight at Lake Oahe where the adjoining property has a population. A prairie dog town will seldom be found exclusively on Corps property. Other common rodents include the Richardson's ground squirrel (*Spermophilus richardsonii*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), pocket gopher (*Thomomys spp*.), prairie vole (*Microtus ochrogaster*), deer mouse (*Peromyscus maniculatus*), and western harvest mouse (*Reithrodontomys megalotis*).

The black-tailed prairie dog is found throughout much of western South Dakota. Although the population is considered to be generally stable in the state, there has been concern about declines in other parts of its range. In 1998 the National Wildlife Federation filed a petition asking the U.S. Fish and Wildlife Service to list the black-tailed prairie dog as a federal threatened species. The U.S. Fish and Wildlife Service determined that this species was warranted for such a listing, but listing was precluded by higher listing priorities. South Dakota is one of 11 states that has worked cooperatively to improve surveys and develop management programs to help avoid the need to list the black-tailed prairie dog as a Federal threatened species (SDGFP 2007b). In August 2004, the black-tailed prairie dog was removed from Federal candidate list. (SDGFP 2007b).

Prairie dog shooting is prohibited on public lands in South Dakota from March 1 through June 14. Shooting is permitted year-round on private lands (SDGFP 2007b). The exception is the Conata Basin in Buffalo Gap National Grassland, which is closed to prairie dog shooting year-round (SDGFP 2007b). The State shooting closure does not apply to private or tribal lands in South Dakota (SDGFP 2007b).

REPTILES AND AMPHIBIANS

Reptiles and amphibians on Lake Oahe are somewhat limited in terms of diversity. The dominant amphibians are leopard (*Rana pipiens*) and chorus frogs (*Pseudacris triseriata*); woodhouse's toad (*Bufo woodhousei*), plains spadefoot (*Spea bombifrons*), and Great Plains toads (*Bufo cognatus*); and tiger salamanders (*Ambystoma spp*.). Common reptiles include the snapping turtle (*Chelydra serpentina*), western painted turtle (*Chrysemys picta belli*), bull snake (*Pituophis catenifer sayi*), prairie rattlesnake (*Crotalus viridis*), red-sided garter snake (*Thamnophis sirtalis*), and plains garter snake (*Thamnophis radix*). The midland smooth softshell (*Apalone mutica mutica*), false map turtle (*Graptemys pseudogeographica*), western hog-nosed snake (*Heterodon nasicus*), and eastern yellow-bellied racer (Coluber constrictor) are less commonly seen species.

AQUATIC NUISANCE SPECIES

Aquatic nuisance species (ANS) is a legal definition for aquatic plants, animals and pathogens that when introduced into new ecosystems have harmful impacts in the way the ecosystem functions. ANS ultimately reduce the recreational and functional value of aquatic resources.

One of the most problematic ANS in recent years has been dreissenid mussels, which includes the zebra mussel ((*Dreissena polymorpha*) and quagga mussel (*Dreissena bugensis*). Dreissenid mussels are

efficient filter feeders which can out compete native species and form colonies so dense they clog the intakes of power generating plants, waterworks, and other facilities. Dreissenid mussels have become well established in the Great Lakes and are spreading into other major waterways in the United States. To date they have not been detected in Lake Oahe.

A number of active measures have been taken to prevent the infestation and establishment of these mussels in Lake Oahe and other waters in North Dakota and South Dakota. The SDGFP and other state and federal agencies have been involved in prevention through a number of efforts including rules and statutes as well as active programs designed to prevent infestations. Some of the most relevant actions include pages in the SDGFP fishing handbook describing potential Aquatic Nuisance Species (ANS) and their control and development of a South Dakota ANS website providing information on ANS relevant to South Dakota, their current distribution and control measures as well as a means of reporting ANS sighting. The NDGF places colonization substrates (traps) in areas likely to be infested with zebra mussels to detect their arrival and inspects for zebra mussels on boat docks or buoy lines removed from the waters (NDGF 2005).

Another ANS species of concern is the viral hemorrhagic septicemia (VHS) virus, which causes a deadly fish disease. Historically associated with freshwater salmonids in western Europe, it was first discovered in the United States in the late 1980s among salmon returning from the Pacific in Washington state. Massive die-offs have since occurred among a wide variety of freshwater species in the Great Lakes.

To date, North Dakota has a limited number of ANS in a few isolated locations (NDGF 2005). ANS can arrive in the Oahe area with recreational boats or other equipment that arrives from ANS infested areas. Commercial importation of undesirable species to support the pet trade, water gardens, and landscaping means it is easier for a noxious species to enter commercial markets and become widely distributed. The state of North Dakota has created an ANS management plan (NDGF 2005).

The NDGF has developed ANS priority classes to recommend management activities for each classification, and they are:

- Priority Class 1 - These species are currently not known to be present in North Dakota, but have a high potential to invade and there are limited or no known management strategies for these species. Appropriate management for this class includes prevention of introductions and eradication of pioneering populations.

- Priority Class 2 - Priority Class 2 species are present and established in North Dakota and have the potential to spread in North Dakota and there are limited or no known management strategies for control of these species. These species can be managed through actions that involve mitigation of impact, control of population size, and prevention of dispersal to other waterbodies.

- Priority Class 3 - Priority Class 3 species are not known to be established in North Dakota and

have a high potential for invasion and appropriate management techniques are available, but effectiveness is of concern. Appropriate management for this class includes prevention of introductions and eradication of pioneering populations.

- Priority Class 4 - Priority Class 4 species are present and have the potential to spread in North Dakota but there are management strategies available for these species. These species can be managed through actions that involve mitigation of impact, control of population size, and prevention of dispersal to other waterbodies.

A listing of the various ANS in the North Dakota Priority Class can be found in Appendix B. SDGFP and other State and Federal agencies have been involved in prevention through a number of efforts including rules and statutes as well as active programs designed to prevent infestation in the waters of South Dakota. Some of the most relevant actions include adding pages in the SDGFP fishing handbook describing potential ANS and their control; development of a South Dakota ANS website providing information relevant sot South Dakota, their current distribution and control measures and means of reporting NAS sightings; developing and promoting boat wash sites across South Dakota in cooperation with South Dakota Bass Anglers Sportsman's society; installing signs at boat ramps and marinas across the state warning of the threat of ANS and providing information on decontamination procedures. In addition, SDGFP has developed a gear handling policy for staff and contractors which provides protocols for effective treatment of boats and equipment for the prevention of contamination of the stats' waters with ANS.

SDGFP initiated an effort in 2007 to draft a State ANS Management Plan for South Dakota. The ANS management planning effort has involved participation from a number of private, State, Tribal and Federal stakeholders from across South Dakota. This will be a strategic planning effort to make the most efficient use of limited resources for the effective detection and control of ANS across the state. A draft of the plan was completed in August 2008 with a goal of approval by the ANS Task Force by November 2008 and funding and implementation in 2009. As a means of objectively determining relevant threats, SDGFP has contracted with the Department of Wildlife and Fisheries, South Dakota State University to develop an ANS risk assessment. A first draft of this assessment ranks zebra mussels as a primary risk to aquatic resource in South Dakota. Addition efforts in ANS detection, outreach and education and control are expected as the ANS Management Plan is implemented in 2009. (SDGFP 2008).

RARE AND ENDANGERED SPECIES AND COMMUNITIES

Lake Oahe extends nearly 231 river miles north from Pierre, South Dakota to near Bismarck, North Dakota. The variations in topography, soils, hydrology, and vegetation allow several species and rare communities to exist on Lake Oahe project lands. Therefore rare, threatened, and endangered species must be considered in all planning, operations, and management activities in order to reduce the level of environmental degradation within project boundaries.

Federal and South Dakota State listed species that are known to occur at the Lake Oahe Project or may occur at the Project (SDGFP 2005) are listed in Table 2-14. The State of North Dakota does not maintain a list of rare or endangered species independent of the Federal listings. A number of species of concern are also monitored by both the North Dakota Natural Heritage Program (NDNHP) and the South Dakota Natural Heritage Program (SDNHP), although these species do not have an official Federal or State listing status. Species noted in this section may also occur in North Dakota counties or as noted in the following paragraphs.

Table 2-14
Threatened and Endangered Species That Occur on Oahe Project Lands

Common Name	Scientific Name	Federal Listing Status[1]	State Listing Status[2]
Least Tern	*Sternula antillarum*	E	E
Piping Plover	*Charadrius melodus*	T	T
Whooping Crane	*Grus americana*	E	E
Osprey	*Pandion haliaetus*		T
Peregrine Falcon	*Falco peregrinus*		E
Black-footed Ferret*	*Mustela nigripes*	E	E
Pallid Sturgeon	*Scaphirhynchus albus*	E	E
Sturgeon Chub*	*Macrohybopsis gelida*		T
Swift Fox*	*Vulpes velox*		T
Northern River Otter*	*Lontra canadensis*		T
False Map Turtle	Graptemys pseugogeographica		T

[1]/E=endangered, T=threatened

[2]/For South Dakota only; North Dakota does not maintain a separate State list of species

* Species may occur on Lake Oahe project lands, but there are no current records (SDGFP 2005).

FEDERALLY LISTED SPECIES

Whooping cranes have been known to use the project during migration. Areas such as Lake Pocasse, Fort Sully Flats, and Peoria Flats are preferred resting areas. The cranes use cropland and pasture, wet meadows, shallow marshes, shallow portions of rivers, lakes and reservoirs, and alkali basins for both feeding and loafing. This species does not breed in South Dakota. Several sightings are recorded for the project area counties in the SDNHP database (2008), including sighting in 2001 in Hughes and Sully Counties. In North Dakota, the last whooping crane to be spotted was observed in 1972 in Emmons County (NDNHP 2006).

Piping plovers arrive on Lake Oahe in early May and are found the length and breadth of lake, nesting as far south as Peoria Flats just north of the dam to the northern boundary of the project, Mary's Bend (RM 1304), just south of Bismarck, ND. The plovers nest primarily along the reservoir shorelines, but during

times of low lake levels they will nest on exposed sandbars of the old river channel. Depending on the lake level, favored nesting areas include Peoria Flats, Sully Flats, Mission, Cheyenne River Arm, Little Bend, Forest City, Swiftbird Bay, Blue Blanket, Kenel Flats, Stateline Bay, Porcupine Islands, Dredge Island and numerous sandbars from the Gravel Pit to Mary's Bend.

An adult census has been conducted for piping plovers annually on Lake Oahe since 1988. Adult numbers have varied from a low of 21 in 1996 to a high of 372 in 2004 with an annual average of 160 adults. Productivity monitoring has been conducted on the lake since 1992. The number of fledglings (young that are able to fly) has varied from a low of 7 in 1999 to a high of 277 in 2003 with an annual average of 109 fledglings. In 2007, 273 adults and 84 fledglings were counted on the lake. Lake Oahe plays an important role for piping plovers on the Missouri River with the lake providing 21% of all adults for 1988-2007 and 21% of all fledglings for 1992-2007.

Least terns begin arriving on Lake Oahe about three to four weeks after the piping plovers with the earliest birds being seen around the third week in May. Least terns are often found nesting in the same locations as piping plovers. Surprisingly, this includes many of the shoreline beaches of the lake as least terns primarily nest on riverine sites. In addition to nesting on the sandbars exposed in the upper reach of the lake, least terns are also found frequently at Cheyenne River Arm, Forest City, Swiftbird Bay, Kenel Flats, Stateline Bay, Porcupine Islands and Dredge Island.

An adult census has been conducted for least terns annually on Lake Oahe since 1988. Adult numbers have varied from a low of 57 in 1999 to a high of 192 in 1991 with an annual average of 115 adults. Productivity monitoring has been conducted on the lake since 1992. The number of fledglings has varied from a low of 0 in 1995 to a high of 73 in 2006 with an annual average of 37 fledglings. In 2007, 186 adults and 45 fledglings were counted on the lake. Lake Oahe plays a substantial role for least terns on the Missouri River with the lake providing 17% of all adults for 1988-2007 and 12% of all fledglings for 1992-2007.

Populations of the American burying beetle are not known to exist in the area and there are no occurrences recorded in the SDNHP or NDNHP databases (2002, 2006). The soil type required for the beetle's existence is very scarce and the size of these areas within the project area are usually quite small.

Pallid sturgeon sightings on Lake Oahe within the State of South Dakota have become extremely rare over the past 10 to 15 years. The North Dakota portion of Lake Oahe has not had a pallid sturgeon sighting since 1976 in Sioux County (NDNHP 2006). The Oahe tailrace area has existing sturgeon. The most recent sighting recorded in the SDNHP database (2002) for pallid sturgeon was in 2001 in Hughes County.

Topeka shiners inhabit small, quiet pools in clear upland creeks with mostly sand, gravel, or rubble substrates. However, the SDNHP does not list any occurrences of this species in its database (2005) and does not think that Topeka shiners historically occurred in Corson and Dewey counties (SDGFP 2005).

According to the SDNHP, there is a published report that reports some specimens, but those specimens are lost, they were collected in habitat that is not typical of Topeka shiner, and no one before or since has reported the species from that area of the state, even though there has been plenty of inventory work done there. The NDNHP does not have any records of the Topeka shiner (NDNHP 2006).

Black-footed ferret habitat includes open areas of grasslands, steppe, and shrub steppe (prairie dog habitat). Black-footed ferrets dwell in prairie dog towns, raise 2-5 young in prairie dog burrows and prey almost exclusively on prairie dogs. They are rarely observed anywhere but prairie dog towns (Ashton and Dowd 1997). Several sightings for the black-footed ferret are listed in the SDNHP database (2002), but the most recent sighting was in 1972. Since then this small mammal has been extirpated from the project area. However, they were recently reintroduced into areas adjacent to project lands, including Badlands National Park and Buffalo Gap National Grasslands, and the Cheyenne River Sioux Tribe reservation (USFWS 2005). (SDGFP 2005), and the Lower Brule Sioux Tribe reservation (Maka Foundation 2007). In North Dakota, the last black-footed ferret sighting was recorded in 1977 in Morton County (NDNHP 2006).

STATE LISTED SPECIES

According to Ashton and Dowd (1997) the northern redbelly dace, a small freshwater fish, prefers spring-fed streams in the Big Sioux, Minnesota, Niobrara, and Crow Creek drainages in South Dakota. This species is found in the northern United States and Canada in boggy lakes, creeks, and ponds. It is often found in tea-colored, slightly acidic water. A single occurrence, dated 1973, is noted in the SDNHP database (2002) for Walworth County.

The sturgeon chub historically occurred in the Missouri River drainage from Montana to the Mississippi River and in the Mississippi River drainage to the mouth of the Ohio. In South Dakota, it has been found in the Missouri, White, Cheyenne, Grand, and Little Missouri Rivers (Ashton and Dowd 1997). This species prefers swift current areas with channels of large silty rivers, usually over gravel bottoms (ibid). The most recent occurrence of sturgeon chub was recorded in 1997 for Haakon and Ziebach Counties (SDNHP 2002). Prior to that, the database shows only two other occurrences for the species, both dated 1952.

According to Ashton and Dowd (1997), the sicklefin chub's distribution is approximately the same as that of the sturgeon chub, but the sicklefin may be more common. In South Dakota, this species may be restricted to the Missouri River below Ft. Randall Dam or its tributary entrances. The sicklefin chub's preferred habitat includes main channels of large turbid rivers in areas of strong current over sand or fine gravel. Only two sightings are recorded in the SDNHP database (2002), both dated 1952.

The swift fox historically ranged from Canada to northern Texas, but has vanished from much of this range (Sovada and Scheik 1999). The swift fox inhabits open prairies, plains, and shrubby desert areas away from extensively cultivated land. It is usually found in areas with gently rolling hills or undulating topography. In South Dakota, swift fox prefer short to midgrass prairies (Ashton and Dowd 1997). The

SDNHP reports a swift fox sighting in Stanley County in 1992, but the remaining sightings occur prior to 1979 (2002). This species may be present as an incidental visitor to the project area on extremely rare occasions.

Northern river otters are found in and along streams, lakes, swamps, marshes, and the seashore (Nature Serve 2005). The river otter is found in rivers, ponds, lakes, and unpolluted waters in wooded areas. Key habitat components are riparian vegetation, temporary den and resting sites (cavities under tree roots, shrub patches, tall grass) and adequate food (Ashton and Dowd 1997). In South Dakota it occurs along the Missouri River (ibid). Occurrences have been recorded as recently as 1998 and 1999 in Stanley and Haakon Counties of South Dakota (SDNHP 2002).

The false map turtle may be found in the Mississippi, Missouri, and Ohio River drainages. The false map turtle may be more abundant than previously thought and inventories of Missouri River system habitats are needed to more accurately determine its abundance in South Dakota (Ashton and Dowd 1997). The SDNHP (2002) lists five occurrences of the false map turtle in the project area, including two in 1997.

OTHER SPECIES AND COMMUNITIES

Many other species with recorded occurrences in the project area are monitored by the SDNHP but are not given an official Federal or State status. These species are considered rare by the State of South Dakota. Wildlife species include the horned grebe (*Podiceps auritus*), great blue heron, black-crowned night heron (*Nycticorax nycticorax*), Cooper's hawk (*Accipter cooperii*), broad-winged hawks (*Buteo platypterus*), Swainson's hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis*), long-billed curlew (*Numenius americanus*), American woodcock (*Scolopax minor*), California gull (*Larus californicus*), black tern (*Chlidonias niger*), barn owl (*Tyto alba*), burrowing owl, long-eared owl (*Asio otus*), wood thrush (*Hylocichla mustelina*), northern mockingbird (*Mimus polyglottos*), Sprague's pipit (*Anthus spragueii*), black and white warbler (*Mniotilta varia*), Baird's sparrow (*Ammodramus bairdii*), sharp-tailed sparrow (*Ammodramus nelsoni*), silverband shiner (*Notropis shumardi*), blue sucker (*Cycleptus elongates*), dwarf shrew (*Sorex nanus*), pygmy shrew (*Sorex hoyi*), least shrew (*Cryptotis parva*), silver-haired bat (*Lasionycterus noctivagans*), plains spotted skunk (*Spilogale putorius interrupta*), western box turtle (*Terrapene ornata*), smooth softshell turtle, short-horned lizard (*Phrynosoma douglasii*), Ottoe skipper (*Hesperia ottoe*), Iowa skipper (*Atrytone arogos iowa*), regal fritillary (*Speyeria idalia*), and pink heelsplitter mussel (*Potamilus alatus*). In addition, there are several rare plant occurrences in the database including those for bahia (*Bahia spp.*), Easter daisy (*Townsendia exscapa*), Dakota buckwheat (*Eriogonum visheri*), and wild rice (*Zizania aquatica*). Rare communities recorded in the database include common spikerush wet meadow, cottonwood/juniper floodplain forest, saline littoral lake, and lower perennial stream. The State of North Dakota does not maintain a list of rare or endangered species independent of the Federal listings.

Federal or State listed threatened or endangered species that have not been recorded in the SDNHP database but may still occur on project lands include the Eskimo curlew and osprey. The SDNHP database only tracks nesting sites for osprey, meaning that any sightings of non-nesting osprey have not

been recorded. Osprey are likely to be present in the project area as non-resident visitors. However, Eskimo curlew are extremely rare and are not expected to be present in the project area (SDGFP 2005).

North Dakota has the largest population of western fringed prairie orchid left in the United States, numbering over 2,000 individuals, located in the Cheyenne National Grasslands in the southeastern corner of the State (Grondahl and Martin 1997). However, this species is extremely unlikely to occur in the project area.

BIOLOGICAL OPINION

In 2000, the USFWS released a biological opinion on the operation of the Missouri River main stem reservoir system, operation and maintenance of the Missouri River bank stabilization and navigation project, and operation of the Kansas River reservoir system (USFWS 2000). In the biological opinion, these projects were all found to have cumulative effects that are likely to jeopardize the continued existence of the least tern, piping plover, and pallid sturgeon. A Reasonable and Prudent Alternative (RPA) was developed by the USFWS that includes actions that are intended to decrease the likelihood of jeopardizing the continued existence of these three species. An implementation plan for the RPA was prepared and this Master Plan must take into consideration the measures proposed in the RPA and work in coordination with the implementation of the biological opinion (USACE 2001). No measures proposed in the Master Plan may interfere with the measures of the RPA. Components of the RPA include flow enhancement, habitat restoration/creation/acquisition, unbalanced system regulation, adaptive management/monitoring, and propagation/augmentation of pallid sturgeon populations. More detail is provided in the biological opinion document (USFWS 2000).

Because of new data on mortality of terns and plovers, the 2002 designation of critical habitat for the piping plover, and new information on RPA element II, on November 3, 2003, the Corps reinitiated formal consultation. In the 2003 biological opinion, the USFWS retained most of the measures included in the previous biological opinion, but also incorporated a performance-based approach that allows greater flexibility while providing equal or greater biological benefits to all three listed species as compared to the 2000 biological opinion. Both biological opinions included information specific to the status and management of least terns, piping plovers, pallid sturgeon, and bald eagles at Lake Oahe.

VISUAL QUALITIES

The Oahe project adds a tremendous visual diversity to both South Dakota and North Dakota. The highly irregular and rugged shoreline on the lower portion to the more rolling and gentle shoreline on the upper portion of the project and the open water of Lake Oahe itself are all attractive visual resources. From the dam north to Mobridge, the lake is surrounded by high rough bluffs that permit numerous outstanding vistas of the lake and surrounding prairie grasslands. The most prominent feature is the line of the horizon - where skies join the open expanse of land. From Mobridge north, the lake takes on more of the quality of a wide river, with a gentler shoreline and only moderately high banks. The pristine quality of

many areas along the lake offers a desirable attraction to sightseers, campers, and sportsmen alike.

Before the construction of Oahe Dam, the Missouri River floodplain was covered with dense stands of trees and fertile bottomlands. The uplands were characterized by miles of prairie rangeland. Today the stands of trees and bottomlands have been replaced by rugged bluffs and the open water of the reservoir. In the upstream reaches of the reservoir within North Dakota, there are still numerous stands of cottonwood, elm, and willow in the original river bottomlands not inundated by the lake.

Large numbers of waterfowl, wading birds, and shorebirds use the waters of Lake Oahe during migration. Deer are found on the east side uplands and both deer and prong horns on the west side of the lake. Many areas provide habitat and food for both large and small game. Most visitors to the project have an opportunity to view several species of wildlife. With its approximately 2,200 miles of shoreline, Lake Oahe provides an excellent setting for various kinds of outdoor-recreation activities.

The one of the major significant intrusions on the area's aesthetic resources are the large power transmission lines and supporting stations. However, these structures occur mostly in the vicinity of the dam and powerplant. Areas of extreme erosion and sloughing also detract from the aesthetics of the various areas.

MINERAL AND TIMBER RESOURCES

Mineral resources around the Oahe Project consist of sand and gravel deposits and Pierre Shale. The sand and gravel deposits are mined for road construction materials and concrete aggregate. Three gravel pits occur on project lands and are used for project roads or projects - one just outside the West Shore Recreation ORV area south of the dam, one south of One Mile Bay located in the Fort Yates area within the Standing Rock Sioux tribe reservation, and one between Fort Yates and the buffalo pasture within the Standing Rock Sioux tribe reservation. Other pits were transferred as a result of the Title VI legislation. Some were transferred to the BIA within the boundary of the Cheyenne River Sioux Tribe Reservation and one was transferred to the South Dakota Game Fish and Parks Department just outside Mobridge.

Native woodlands in the project area occur in narrow bands and clumps along the rivers and intermittent streams, on steep side slopes, and in the upland areas of the project. Timber resources are not commercially used at the Oahe project.

PALEONTOLOGY

The Missouri River trench in South Dakota has been internationally known for fossil vertebrate and invertebrate remains since the time of the Lewis and Clark expedition in 1804-1806. Lewis and Clark

recorded vertebrate fossils of marine reptiles that were either plesiosaurs or mosasaurs. Later expeditions in the 1800s also collected marine reptile fossils, some of which were new to science and became type specimens (individual plants or animals that serve as the basis for the description of its species). All during the period in which the Missouri River was a major travel corridor, fossils were secured and transported to museums in the Northeast and Europe. As the waterway became less traveled in the early 1900s, collections from these rocks declined. However, through cooperation between the Corps, the South Dakota School of Mines and Technology, and the New Jersey State Museum, paleontologists have resumed the systematic recovery of fossil remains.

The vertebrate fossils from the Missouri River breaks along Lake Oahe occur principally in the Late Cretaceous Pierre Shale. This shale was deposited at the end of the Age of Reptiles, approximately 75-80 million years ago. Four members of this formation, the DeGrey, Verendrye, Virgin Creek, and Mobridge, are well exposed and produce scientifically significant paleontological specimens. This black shale was deposited at the bottom of a shallow sea that extended through the center of North America from the Arctic Ocean to the Gulf of Mexico. Deposition of black mud was punctuated by deposits of volcanic ash (bentonites).

Although dinosaurs dominated the terrestrial deposits to the west, both vertebrate and invertebrate fossils were preserved in the marine deposits of the shallow seaway. Remains of clams and cephalopod mollusks, are commonly preserved in the Pierre Shale members. Microinvertebrates such as foraminiferans have also been found and aid in interpretations of water depth, salinity, and other environmental parameters. Vertebrate fossils include the remains of sharks, boney fishes, diving birds, plesiosaurs, and mosasaurs. The latter marine reptiles were vicious carnivores and are the most common of vertebrate fossils along Lake Oahe. These reptiles are a major focus of current studies in the area.

The upper members of the Pierre Shale exposed in the Oahe project area are the least studied portions. Almost nothing is known of the marine life that existed in this interval because most studies have been made on the lower and middle members of the formation. The upper members of the Pierre Shale record the history of the withdrawal of the shallow sea and the dominance of terrestrial faunas. The late Cretaceous extinction event, which destroyed the dinosaurs, should be recorded in these rocks. This is an area that is targeted for future research.

Through the efforts of the Museum of Geology, intensive collections tied to detailed stratigraphic sections are underway in the middle Pierre Shale. These studies will determine which creatures existed in this portion of the Pierre Shale, their habits, their environment, their changes through time, and perhaps their extinction. The relationship of both invertebrate and vertebrate fossils to volcanic ash deposits is another major focus of these investigations. There are plans to expand these investigations to the upper members of the stratigraphic section in future years.

Overall, the exposures of the middle and upper portions of the Pierre Shale along Lake Oahe possess well preserved, nonrenewable, and scientifically significant fossil remains which should fill a major gap in the

paleontological knowledge of Cretaceous marine deposits. Because this area contains fossil resources of international importance, the area should be managed in a manner that these resources are preserved for public research and education.

CULTURAL RESOURCES

PREHISTORIC AND HISTORIC PERIODS

Much of the history and prehistory of the Oahe region has been shaped by the Missouri River. To the aboriginal peoples in prehistoric times, the river served as a major highway for trade and travel. The rich floodplain soils offered an excellent place for the earthlodge village peoples to raise their crops. Regular floods replenished both the soil nutrients and subsoil moisture for the season.

The region's cultural history has been described as one of the four major regions north of Mexico. The Missouri River Trench and the Great Plains in general, make up one of the most fascinating cultural areas in the Western Hemisphere. The archaeology of the Missouri Trench consists of layers of occupation dating back to the post-Wisconsin glacial period (11,000 Before Present (B.P.)). Every significant time period is represented, from the Paleo-Iindian Tradition starting at 12,000 B.P. to the historic period of Euro-American settlement to the present.

As shown on Table 2-15, the Oahe project has 1,949 historic and prehistoric sites located on Corps land, more than any of the other main stem reservoirs in the Omaha District. Many of these sites have not been formally evaluated concerning their eligibility for listing on the National Register of Historic Places (NRHP). As a result, these unevaluated sites are simply *considered* eligible for listing on the NRHP and receive the same level of protection a formally evaluated site would have. These sites range from small, single artifact locations, to large habitation sites that can exceed a mile in length. Some sites exhibit multiple occupations spanning thousands of years. Others consist of simple, single occupation or activity areas representing time spans of only a few hours or days. The following cultural history illustrates the time periods represented by these sites.

a. Paleo-Indian Period (12,000-8,000 BP). The Paleo-Indian Period consisted of groups of people who were big game hunters and gatherers. These people hunted mammoth, mastodon, and bison. The artifacts which they have left behind include large lanceolate projectile points. Most of these sites represent butchering or campsite locations. Because of their age, these sites are fairly rare. Over the millennia many of these sites have been destroyed by river meandering, wave action, slumping, erosion, or other causes.

The few Paleo-Indian sites which do remain on the northern plains are important in terms of what can be learned about these early peoples and the environment of the time. Because of their scarcity, any site found to be of this age would almost certainly be eligible for the NRHP.

Table 2-15
Cultural Resources at Main Stem Projects

Cultural Resources	Fort Peck	Garrison	Oahe[1]	Big Bend	Fort Randall	Gavins Point
Number of Sites[2]	5	800	1949	390	351	80
National Register Quality Sites	1	40	61	145	24	5
Shoreline Miles	1520	1340	2250	200	540	90
Number of Sites per Shoreline mile	n.a.[3]	0.6	0.9	2	0.3	0.9

[1] This number includes sites that are located on transferred, Title VI lands. While the Corps retains responsibility (ARPA, NAGPRA, NHPA) for the sites located on lands transferred to the State of South Dakota, the BIA is responsible for the management of sites located on CRST lands.

[2] The number of cultural resource sites that are listed on, eligible for, or potentially eligible for the NRHP. The number of historic properties is expected to increase.

[3] Not available. Surveys incomplete.

b. Archaic Period (8,000-2000 BP). The extinction of many of the big game animals of the Paleo-Indian Period resulted in a shift to smaller game during the Archaic Period. People hunted a large variety of game including deer, bison, elk, pronghorn, rabbit, and other small mammals, fish, and amphibians.

Spears and darts were the primary hunting tools used. It appears that these people were nomadic and most likely followed the seasonal wildlife migrations, journeying to various locations in their region to take advantage of the locally available food sources. As with the Paleo-Indian sites, this site type is quite rare, due to the amount of impacts that have occurred to them over time.

c. Woodland Period (2000-1000 BP). Evidence of new technologies, domestic dwellings, and expanded social interaction marked the transition from the Archaic to the Woodland Period. Many cultures flourished during the Woodland Period. Permanent villages and associated horticultural tools indicate the use of reliable subsistence bases that included the beginnings of agriculture. The bow and arrow, as well as pottery, were beginning to be utilized at this time.

Several Woodland sites are found in the Oahe area. Examples of this site type are often found below other occupation zones such as the Plains Village or later components. The sites from the Woodland Period offer valuable insights into the early stages of agriculture and sedentary village life. Like the Archaic sites, most Woodland sites are somewhat deeply buried and are often exposed only by shoreline erosion. Burial mounds from this time period remain as visible features on the landscape; however, agricultural activities over the last 130 years have severely impacted many of these mound features.

d. Plains Village Period (1000-250 BP). This period represents a climax in the prehistory of the

Great Plains. The peoples of this period lived in large villages composed of substantial earthen lodges. Many of these villages were fortified with a deep ditch or moat-like structure, further protected by a palisade, or log wall. These protective measures seem to indicate increased inter-tribal conflict, possibly due to increased competition for the resources along the Missouri River during this time period.

In addition to constructing sturdy villages, the Plains Village people raised crops on the floodplains (primarily corn, beans, squash, and sunflowers) and continued their reliance on bison as a major food source. They produced pottery of excellent quality and made tools from stone and bone. In spite of the reliable subsistence base of crops and bison, diseases that came with the westward expansion of Euro-American pioneers decimated many of the tribes in this region.

There are numerous Plains Village sites in the Oahe project area. These sites contain a wealth of information regarding the successful adaptation to life on the Plains. While pristine examples of Oahe's Plains Village sites do exist, many continue to be impacted by inundation, vandalism, erosion, bank slumping, and other forms of destruction.

e. Historic Period (1780-Present). The Historic Period in the Oahe region is characterized by Euro-American exploration and settlement, documented through written historical records. Early Jesuits, explorers and fur trappers visited the area prior to this time but they left few records. These groups traversed the Missouri River, using it as an access between their eastern headquarters and the trapping and hunting areas to the west. Prince Maxmillian and his artist, Carl Bodmer, traveled through the upper Missouri River area, made many observations and painted many pictures of the people, animals, birds, and plants of this area.

By 1850 the Sioux had gradually replaced the Mandan and Arikara as the predominant tribes in this region. Since their acquisition of the horse, the Sioux became even more nomadic and were able to range far onto the plains as they followed the large herds of bison they relied on. The eventual decimation of the bison herds, and the conflicts caused by the westward expansion of Euro-Americans, eventually moved the Sioux onto reservations in the late 1800s. Two of these reservations, the Cheyenne River Sioux Reservation and the Standing Rock Sioux Reservation, are located on the western shores of Lake Oahe.

As former Indian lands were opened to settlement in the late 1800's, homesteaders and ranchers moved from east to west, across the Missouri River and into western regions of the Dakotas. Many of these homesteaders soon discovered the difficulty of supporting a family on a 160 acre claim, in a climate that was more arid and much less forgiving than the more temperate eastern regions. As a result, many homesteaders abandoned their claims and moved back east.

There are numerous sites associated with the Historic Period distributed throughout the Oahe project area. Some of these sites are underwater but of the remainder, some still contain buildings, surface artifact scatters, depressions, and foundations. These sites are subject to the same adverse impacts as their

prehistoric counterparts, namely - inundation, vandalism, erosion, bank slumping, and other forms of destruction.

CULTURAL RESOURCE MANAGEMENT

An Oahe Cultural Resources Management Plan (CRMP) was finalized in FY 2004. Cultural Resource definitions used in this master plan can be found in Appendix D. As was shown on Table 2-15, Lake Oahe has the greatest number of cultural resource sites of any lake on the Missouri River. Resources that are either on or eligible for listing on the NRHP are called historic properties. These properties could include those from any prehistoric or historic period. Many of the sites on Lake Oahe have not been formally evaluated concerning their eligibility for listing on the National Register of Historic Places (NRHP). As a result, these unevaluated sites are simply considered eligible for listing on the NRHP and receive the same level of protection a formally evaluated site would have.

In general, there are several methods for managing the historic properties on Oahe project land. If a cultural resource site is not being threatened by any impacts such as erosion, vandalism, agricultural impacts, or construction, it is best to leave the site undisturbed. Sites are best protected by a thick growth of vegetation that serves as a disguise for the features within the site. If a cultural resource site is being threatened in some manner, it is pertinent to remove the threat or to protect the site.

Some potential land uses of the Oahe project lands may not be compatible with the Omaha District's responsibility to manage historic properties that are located within project boundaries. Therefore, it is necessary to place some restrictions on use so that current and future land use will not impact historic properties. There are two sets of guidelines that apply to land use within management areas: standard and consultation.

a. Standard Guidelines. Some areas contain no known evidence of cultural resources. However, it is important to remember that the possibility of uncovering a previously unreported site always exists. All projects must be reviewed by an Archeologist who fulfills the requirements set forth in the *"Secretary of the Interior's Professional Qualifications"* prior to the project beginning to determine if a survey is needed. Field personnel should know the procedures for dealing with site discovery. Guidelines for the proper procedures for coordination and addressing cultural site surveys can be found in the CRMP.

b. Consultation Guidelines. Most of the management units contain at least one cultural resource site. Projects in these areas must undergo the consultation process as identified in the Programmatic Agreement described in a later section. Unevaluated sites that could be impacted will be evaluated to determine their eligibility for the NRHP. Some sites are not eligible for the NRHP. However, they will be monitored in the event artifacts or features are uncovered that may be important for reevaluating the status of the site.

PROTECTION OF CULTURAL RESOURCES

A large percentage of cultural resource sites that are listed on the NRHP, potentially eligible for the

NRHP, or unevaluated are being impacted by a variety of human activities. The Omaha District acknowledges the importance of these irreplaceable cultural resources and will take the necessary steps to monitor, reduce, or eliminate impacts before the sites are destroyed. Actions to be taken include:

- Modify agricultural and grazing leases to remove areas or alter practices;
- Carefully monitor/manage new development and maintenance within existing recreation areas;
- Monitor vandalism, erosion and other impacts;
- Stabilize and protect cultural resource sites being destroyed by shoreline erosion and other impacts, utilizing appropriate measures.

Additional details for the protection of cultural resources can be found in the CRMP.

THE PROGRAMMATIC AGREEMENT AND ITS INTEGRATION INTO THE MASTER PLAN

The Final Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act, as amended; March 19, 2004 (referred to as PA) was established as an attempt to address all problems associated with cultural and historic resource impacts involved with the ongoing operation and maintenance of the Missouri River main stem dams. It is designed as an initiative that will facilitate the development of processes and strategies to minimize, avoid, or mitigate the ongoing adverse impacts the system causes.

The primary purpose and legal authority for the PA are found in the National Historic Preservation Act (NHPA), particularly section 106, section 110, and section 101 of that act. Federal agency compliance with NHPA section 106 is governed by regulations issued by the Advisory Council on Historic Preservation, and the PA was negotiated pursuant to those regulations. The signatories agreed that the Missouri River Main Stem System shall be administered in accordance with the stipulations in the PA to take into account and attempt to mitigate adverse effects to historic properties and satisfy the responsibilities of the Corps pursuant to section 106.

In addition to section 106 and the Advisory Council's regulations, numerous other provisions of the NHPA, some of which are cited in the PA, are applicable to activities of the Corps. Additionally, the Corps is responsible for complying with other legal authorities, including Federal statutes, regulations, Executive orders, and guidance documents, as well as any applicable tribal and State laws.

The Corps complies with sections 106 and section 101(d)(6) of the NHPA and the Native American Graves Protection and Repatriation Act (NAGPRA) in circumstances in which both authorities apply, such as the discovery of human remains that may be associated with a historic property. In addition to complying with NAGPRA, the Corps shall take steps to identify if human remains and other types of items meeting the definitions outlined in NAGPRA are

associated with a property that may meet the National Register criteria and for which section 106 and section 101(d)(6) also apply. In such case, the Corps shall comply with the provisions of this PA and 36 CFR part 800, in addition to NAGPRA and any applicable NAGPRA Memoranda of Agreement.

The Tribes expect the Corps to manage lands under its jurisdiction in a manner consistent with the Federal trust responsibility to Indian Tribes. The Corps acknowledges that the trust responsibility includes legal responsibilities and obligations to provide the highest standards of fiduciary care with respect to Federal and other activities that may affect the lands, other trust resources, and the exercise of the powers and rights of Indian nations. All Corps actions, in the Missouri River Basin, directly or indirectly affect trust land, and some of the lands managed by the Corps are within reservation boundaries established by treaties where the Tribes and their members continue to have treaty-based rights even though lands have been taken out of trust status. Federal lands managed by the Corps (both within and outside reservation boundaries) include places that hold religious and cultural importance of the Tribes, and some of these places are crucial for the cultural identities of the Tribes and, as such, for the survival of the Tribes as distinct Peoples. Some of these places contain the graves of ancestors and funerary objects, in which Federal law recognizes the right of lineal descendants and culturally affiliated Tribes to take custody in the event that they are removed from the Earth. The Tribes expect the Corps to treat these sacred and cultural significant places as subject to the Federal trust responsibility.

This means that the Tribes must be engaged in consultation before decisions are made and that the Tribes expect to be equal participants in making decisions and in carrying out decisions. Consultation shall be both specific to individual Tribes and with as many comprehensive consultations attended by all affected Tribes as are necessary, with real efforts to reach consensus. Consultations shall be conducted in a positive manner, on a government-to-government basis, honoring all treaties and the trust doctrine which entail a fiduciary and fiscal responsibility of the Corps. Decisions will be made on a government-to-government basis. Finally, the Corps shall include, as consulting parties, affected Tribes in any review or update of the Master Manual.

The Corps and the Affected Tribes, Tribal Historic Preservation Officers (THPO), State Historic Preservation Officers (SHPO), Advisory Council for Historic Preservation (ACHP) work together to develop and implement partnerships so that Affected Tribes, THPOs, SHPOs, ACHP are involved in the development and implementation of the main stem system cultural resources program that promote tribal historic preservation goals.

Stipulations in the PA mandated the Corps to establish a Site Monitoring Program, which provides continued oversight of cultural resources located on lands managed by the Corps. Routine Monitoring records information on site conditions and effects or threats to them (including but not limited to, erosion, recreational, agricultural and other encroachment, looting and vandalism). The Corps utilizes this information to plan corrective management actions. The intent of the Site Monitoring Program was for PA signatory parties to cooperatively protect, manage and inventory sites located on Corps managed

lands.

Stipulation 14 of the PA (Enforcement Program) mandated the Corps to establish a Cultural Resources Enforcement Program. The Corps address this stipulation by contracting with a U.S. Fish and Wildlife Agent to enforce Cultural Resource Laws by investigating and prosecuting reported offenses. A toll free looting and artifact collection hotline 1-866-No-SWIPE provides a non-threatening and easy way to the public or others to report and notify the Corps if they have observed, known, suspected looting, or suspicious activities.

Stipulation 15 of the PA (Education Program) mandated the Corps to establish a Cultural Resources education program which informs the public of Native American cultures along the Missouri River, Cultural Resource Laws and associated violations, and the Corps mitigation efforts. The educational materials were developed through consultation with PA signatory parties.

INTEPRETATION

The history and resources of the Oahe area present an excellent opportunity for Federal, State, Tribal, and local agencies to develop a cooperative interpretive program. The location and size of the project are unique. The paleontological resources, isolated biological communities, and human history are unique features that could be addressed in an interpretive program.

A team of interpretive specialists from governmental entities with a direct interest in the Oahe project should identify goals for inclusion in an interpretive prospectus. A project interpretive plan should be developed taking into account these regional needs and desires.

DEMOGRAPHICS

HISTORIC PERSPECTIVE

Several Indian Tribes lived in the North Dakota/South Dakota region before white explorers first arrived. The Arikara, Cheyenne, Hidatsa, and Mandan peacefully farmed the land. Most of them lived in the Missouri Valley, in villages fortified against attacks by warring tribes.

The Mandan tribe lived a sedentary agricultural lifestyle along the Knife and Missouri Rivers. Their homes were semi-subterranean earthlodges. The Hidatsa lived in the Devils Lake area, years before the Sioux migrated into the Dakotas. As the Sioux moved in from the east, the Hidatsa moved southwest and settled on the Missouri where it meets the Heart River.

The Arikara also figured prominently in the earliest recorded history of the Oahe project area. During the sixteenth century the Arikaras moved northward from Nebraska and Kansas. A severe drought in the

Central Plains forced these non-nomadic peoples north into South Dakota. The Arikara attained a high degree of self-sufficiency, supplying most of their wants from the raw materials at hand or obtaining needed items through bartering with neighboring tribes. However, by the end of the eighteenth century the Arikara had fallen into a state of decline. Reduced by warfare and disease, they moved farther northward in 1797 to the mouth of the Grand River. By 1831, the few remaining Arikara villages were permanently abandoned with the Arikara joining the Mandans, who lived along the Missouri in present-day North Dakota.

The Sioux first migrated into the Missouri Basin in the mid-eighteenth century after the pressure of better-armed enemy tribes and dwindling food supplies caused them to abandon their settlements in the Upper Mississippi Valley. Three major divisions in the Sioux Nation came to be recognized as they migrated westward. The Teton (Western) Sioux were the first of the subtribes to migrate onto the plains. The Middle Sioux were the more sedentary of the subtribes but eventually migrated west following the Teton Sioux. The Santee (Eastern) Sioux were the last to leave the Great Lakes region. The gradual acquisition of the horse and gun enabled the Teton subtribes, in particular, to pursue the great bison herds that roamed the Missouri Basin. This eventually transformed the Teton subtribes to a migratory culture centered on the buffalo.

Historians have called the Lewis and Clark Expedition one of the most perfectly executed explorations of all time. For 2 years, 4 months, and 9 days, Meriwether Lewis and William Clark led their group into the untamed reaches of the Louisiana Purchase, starting up the Missouri River in 1804 and returning to St. Louis in 1806. Their acclaimed journey took them through the heart of both South Dakota and North Dakota. Lewis and Clark met with the Teton Sioux in the Pierre area and visited three Arikara villages near Mobridge before paddling their two pirogues and their keelboat into North Dakota. In North Dakota, they established their winter camp at Fort Mandan, close to the five Knife River villages of the friendly Mandan and Hidatsu Indians. It was here that they recruited the French-Canadian fur trader, Toussaint Charbonneau as an interpreter and guide, as well as Charbonneau's Shoshoni wife, Sacagawea,. Two area highways follow Lewis and Clark's course. Commemorating the years of the expedition, South Dakota and North Dakota State Highway 1804 and 1806 parallel the east side and the west side of the river, respectively.

With the westward expansion of the United States in the mid-1800s, the Central Plains was transformed into an area of prime settlement. Although many of the people that settled in the Dakotas between 1860 and 1910 came from east of the Mississippi River, the area also attracted a great number of immigrants from northern Europe--primarily Norwegians, Germans, and German Russians. As white settlers became more common on the Central Plains, conflicts between the Sioux and the settlers increased as the Sioux struggled to preserve their lands, sovereignty, and culture. In 1865 a congressional committee began a study of the Indian uprisings and wars in the West. This study led to an act to establish an Indian Peace Commission to end the wars and prevent future Indian conflicts. In the spring of 1868 a conference was held at Fort Laramie, in present day Wyoming, which resulted in a treaty with the Sioux.

In the Fort Laramie treaty, the U.S. recognized the Black Hills of South Dakota, which are sacred to the Sioux, as part of the Great Sioux Reservation set aside for exclusive use by the Sioux people. Once gold was found in the Black Hills, miners were soon moving into the Sioux hunting grounds and demanding protection from the U.S. Army. The United States would continue its conflict with the Sioux in the Black Hills until the Government confiscated the land in 1877. To this day, ownership of the Black Hills remains the subject of a legal dispute between the U.S. Government and the Sioux.

The Act of 1889 broke up the Great Sioux Nation into smaller reservations, which exist today at about one half their original sizes in 1889. The separate tribes of the Sioux nation, which had once controlled a vast domain extending from the James River in North Dakota and South Dakota west to the Big Horn Mountains of Wyoming, had found themselves confined within the shrunken boundaries of their present reservations with subsequent limitations in their cultural practices.

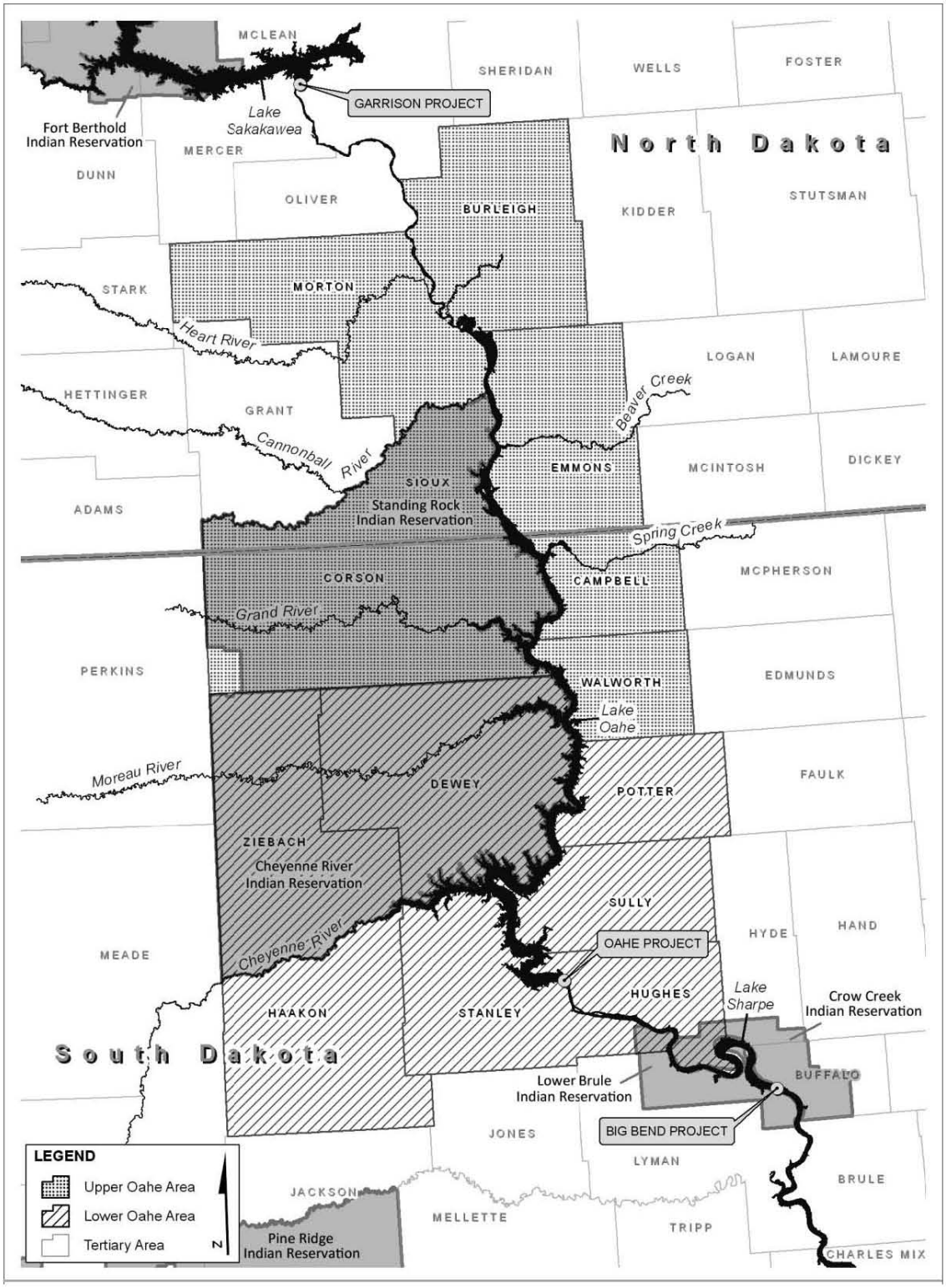
On the west bank of the Missouri River, the Standing Rock Reservation was set aside for the Hunkpapa and Blackfeet subtribes of the Teton Sioux and the Upper and Lower Yanktonai subtribes of the Middle Sioux. With its tribal headquarters located in Fort Yates, North Dakota, this reservation splits the boundary between North Dakota and South Dakota. Just south of this reservation, in north-central South Dakota, is the Cheyenne River Reservation. This reservation is home to four of the Teton subtribes - Mineconjou, Two Kettles, Sans Arcs, and the remaining Blackfeet. Its tribal headquarters is located in Eagle Butte, South Dakota.

CURRENT POPULATION TRENDS

The demographic analysis will define three areas that comprise the Lake Oahe area of influence. The "Upper Oahe" area consists of those counties adjacent to Lake Oahe in the area including and upstream from Mobridge, South Dakota. In this area, Lake Oahe is more riverine in appearance. Mobridge also represents the “halfway point” of Lake Oahe. The "Lower Oahe" area consists of the remainder of the counties bordering Lake Oahe south to Oahe Dam. The "tertiary" area encompasses the entirety of the States of North Dakota and South Dakota. Within these defined areas, three different socioeconomic-demographic environments are found: urban, rural, and American Indian Reservation. The Upper Oahe area demographic analysis consists of four counties in North Dakota: Burleigh, Morton, Sioux, and Emmons County; and three South Dakota counties: Campbell, Corson, and Walworth County. The Lower Oahe area demographic analysis consists of seven counties in South Dakota. From north to south, on the west bank are Dewey and Ziebach, Haakon, and Stanley Counties. On the east bank, from north to south, are Potter, Sully, and Hughes Counties. Figure 2-6 displays the counties that constitute both the Upper Oahe and Lower Oahe areas.

According to 2006 census figures, the seven Upper Oahe area counties together contain 10,080 square miles and have a total population of 120,272, for a population density of 11.9 persons per square mile. This represents a 14.9-percent increase from the 1990 population of 104,669. From 1980 to 1990 the population increased 0.7 percent and from 1970 to 1980 the population increased 18.7 percent.

Figure 2-6
Lake Oahe Demographic Area



Burleigh County (containing the city of Bismarck) and Morton County (containing the city of Mandan) in North Dakota are relatively urban counties, having population densities of 42.5 and 13.1 persons per square mile, respectively, in 2000. (Corson County, South Dakota, by comparison, has a population density of 1.7 persons per square mile.) The City of Bismarck is the largest city in the Upper Oahe area, with an estimated 2006 population of 58,333 and an estimated 2006 metropolitan statistical area (MSA) population of 101,138. As the capital of North Dakota, it is the second-largest city in the State. Located on the Missouri River in south-central North Dakota, Bismarck lies directly to the north of Lake Oahe at the juncture of U.S. Interstate 94, going east-west, and U.S. Highway 83 from the north. The Bismarck MSA includes Mandan, located directly across the Missouri River to the west. Mandan had an estimated 2006 population of 17,449 and is also adjacent to U.S. Interstate 94.

The only other city of any size in the Upper Oahe area is Mobridge, in Walworth County, South Dakota. Mobridge is on the east side of Lake Oahe in the northern portion of Walworth County. (Walworth County is the southernmost county of the Upper Oahe counties). Located on U.S. Highway 12, Mobridge had an estimated 2006 population of 3,231.

Although general population data are available for 2006, the most recent census data for most demographic areas, such as ethnicity, age, income, and education levels, are from 2000. Of the 115,031 people in the Upper Oahe area in 2000, approximately 96,750, or 92.4 percent, were white. American

Indians numbered 9,575 and made up roughly 8.3 percent of the population. Blacks, Asians, Pacific Islanders, and other races together made up slightly over 1.6 percent of the total. The percent of the population living in an urban area in 1990 was 63.5 percent. Another 3.6 percent lived in a non-urban area and nearly a third (32.9 percent) lived in a rural area.

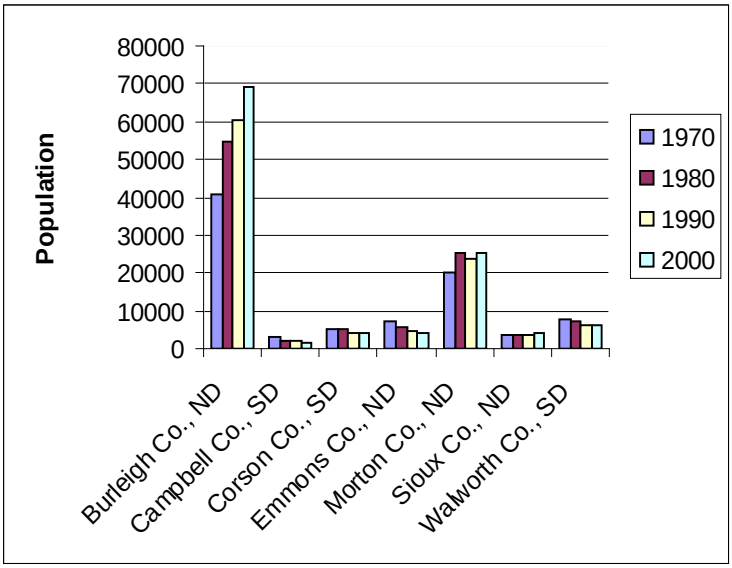
Although American Indians represented only 8.3 percent of the total population for the area, they represented 84.6 percent of the population in Sioux County, North Dakota and 60.8 percent of the population in Corson County, South Dakota.

Most of the population growth has occurred in the urban areas. For example, the population of urban Burleigh County and Morton County increased from 1970 to 2000 (Figure 2-7). In contrast, the population of rural Emmons County in North Dakota decreased during this period.

This disparity in population growth rates is attributable partly to the migration of young people to urban areas so common in rural counties in the west-central U.S. For example, although the 2000 median age in urban Burleigh County was 35.9, the median age in rural Emmons County was 44.5. The median age in North Dakota was 36.2, while the median age in South Dakota was 35.6, close to that of the U.S. median age of 35.3.

The educational level is high in Burleigh County. The 2000 Census reported that in Burleigh County, of those 25 years old or older, 87.9 percent were high school graduates and 28.7 percent had undergraduate

Figure 2-7
Population in Upper Oahe Counties from 1970-2000



degrees. Both of these rates are above the 83.9 and 22.0 percentage rates for the State of North Dakota; the 84.6 and 21.5 percentage rates for the State of South Dakota, and the 80.4 and 24.4 percentage rates for the U.S.

The educational level is much lower in the rural counties. The Standing Rock Sioux Reservation counties of Sioux (North Dakota) and Corson (South Dakota) reported high school and college graduation rates of 78.5 and 11.2 percent and 76.0 and 11.3 percent respectively. Even lower rates were reported in Emmons County (65.9 and 12.3 percent). This is partially attributable to the larger proportion of older residents in rural counties.

The educational level is much lower in the rural counties. The Standing Rock Sioux Reservation counties of Sioux (North Dakota) and Corson (South Dakota) reported high school and college graduation rates of 78.5 and 11.2 percent and 76.0 and 11.3 percent respectively. Even lower rates were reported in Emmons County (65.9 and 12.3 percent). This is partially attributable to the larger proportion of older residents in rural counties.

b. Lower Oahe Demographics. The seven counties that make up the Lower Oahe area are very much like the seven counties in the Upper Oahe area. Hughes County is the location of Pierre, the capital of South Dakota. This is the only county of the Lower Oahe area that is urban in nature. Haakon, Stanley, Potter, and Sully Counties are very rural. Dewey and Ziebach Counties, also rural, together comprise the Cheyenne River Sioux Reservation.
The seven Lower Oahe area counties together contain 10,136 square miles and had an estimated 2006 population of 34,199 for a population density of 3.4 persons per square mile. This represents a 5.5-

percent increase from the 1990 population of 32,416. The population increased by 1.4 percent from 1980 to 1990 and by 5.8 percent between 1970 and 1980.

The City of Pierre, with an estimated 2006 population of 14,095, is the largest city in the Lower Oahe area counties and is the seventh largest city in South Dakota. Pierre is located on the east bank of the Missouri River approximately 6 miles south of Oahe Dam. Pierre is located in the center of South Dakota and lies at the junction of U.S. Highway 14, running east-west, and U.S. Highway 83 running north-south.

Fort Pierre is on the west bank of the Missouri River and directly across from Pierre. Fort Pierre is in Stanley County and enjoys the same highway access as Pierre. With an estimated 2006 population of 2,067, it is the second largest city in the Lower Oahe area.

Of the 34,189 people in the Lower Oahe area in 2000, whites numbered 25,652 (75.0 percent). American Indians numbered 7,909 and made up 23.1 percent of the population. Blacks, Asians, Pacific Islanders, and other races together made up about 1.9 percent of the total.

Although American Indians represented 23.1 percent of the total population for the area, they represented 74.2 percent of the population in Dewey County and 72.3 percent of the population in Ziebach County. In three of the counties, Haakon, Potter, and Sully, American Indians represented less than 2.5 percent of the population.

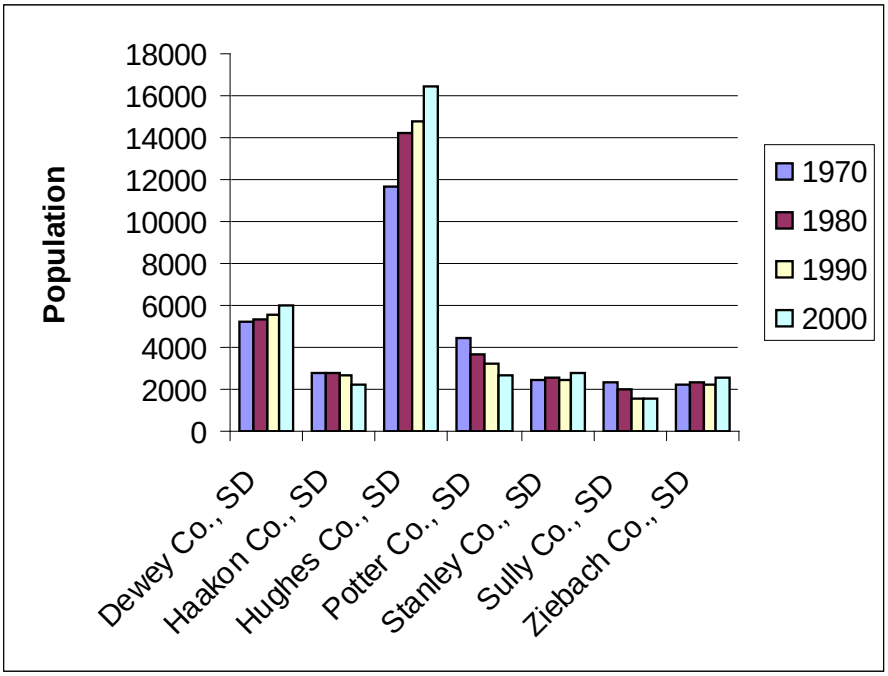
In the years between 1990 and 2000 the populations of four counties, Dewey, Hughes, Stanley, and Ziebach, increased (Figure 2-8). In the previous decade, only Hughes County (a relatively urban county) and Dewey County (a reservation county) showed population growth. In the decade between 1990 and 2000, Haakon and Potter Counties had the largest decreases in population at 16.3 and 15.6 percent respectively. Sully County's population loss slowed over that time period to 2.1 percent.

As in the Upper Oahe area, the disparity in population growth rates is attributable mostly to the migration to urban areas. The 2000 median age was 45.8 in Potter County and 23.8 in Ziebach County.

The educational level is high in Hughes County. The 2000 Census reported that in Hughes County, of those 25 years old or older, 89.5 percent were high school graduates and 32.0 percent had undergraduate college degrees. In the rural counties the educational level is much lower.

The reservation counties of Dewey and Ziebach reported the lowest high school and college graduation rates of 77.4 and 12.2 percent and 71.4 and 12.0 percent respectively. The educational levels for the remaining Lower Oahe area counties were scattered in between the levels for Hughes County and Ziebach Counties.

Figure 2-8
Population in Lower Oahe Counties from 1970-2000



c. Tertiary Area. The tertiary area demographic analysis consists of all remaining counties in North Dakota and South Dakota. Within the States of North Dakota and South Dakota, six cities in the tertiary area had an estimated 2006 population of more than 30,000 -- four of these cities are located in North Dakota and two in South Dakota. The largest city in North Dakota is Fargo. With an estimated 2006 population of 90,056, it is nearly 200 miles driving distance east of Lake Oahe. Grand Forks had an estimated 2006 population of 50,372 and is located approximately 270 miles from Bismarck to the east-northeast. Minot, North Dakota had an estimated population of 34,475 in 2006, and is roughly 110 miles north of Bismarck.

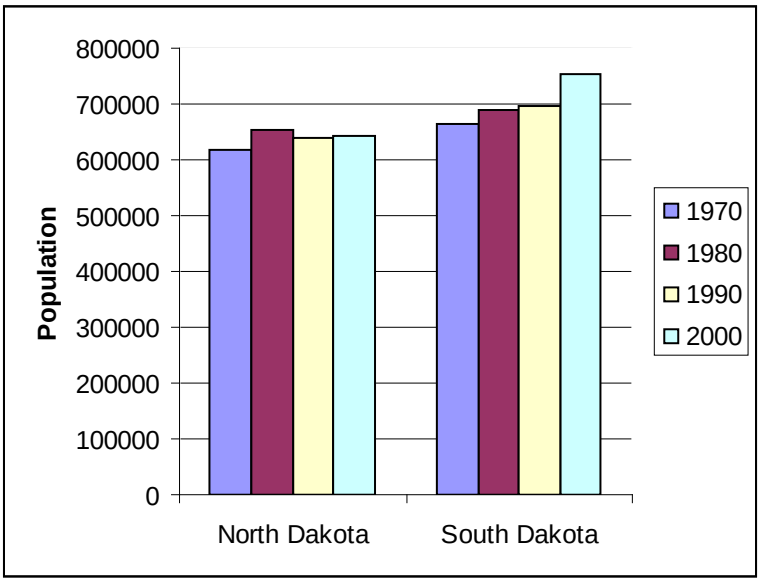
There are two cities in South Dakota that had an estimated 2006 population greater than 30,000. The largest city in South Dakota is Sioux Falls which had an estimated 2006 population of 142,396 and is about 200 miles east-southeast of Oahe Dam. Rapid City had a population of 62,715 in 2006 and is just over 100 miles west of Lake Oahe.

The populations of the States of North Dakota and South Dakota show slow long-term growth (Figure 2-9). In 2006, the estimated population in North Dakota was 633,867 and in South Dakota it was 781,919. Because of such factors as out-migration of the young, and increasing life expectancy, the median age has continued to rise in North Dakota and South Dakota. The median age in North Dakota increased from 28.3 in 1980 to 32.4 in 1990 and to 36.2 in 2000. The median age in South Dakota was 28.9, 32.5, and 41.4 in the same years, respectively.

The educational level has also increased significantly over the last three decades. The percentage of residents 25 years of age or older who had completed four or more years of high school in North Dakota has steadily increased: 50.3 percent in 1970, 66.4 percent in 1980, 76.7 percent in 1990, and 85.5 percent in 2000. The percentage of residents in South Dakota completing four or more years of high school has also steadily increased: 53.3 percent in 1970, 67.9 percent in 1980, 77.1 percent in 1990, and 91.8 percent in 2000. The U.S. average in 2000 was 84.1 percent.

The percentage of residents 25 years of age or older who had competed four or more years of college in North Dakota has increased from 8.5 percent in 1970 to 15.2 percent in 1980 to 18.1 percent in 1990 and 22.6 percent in 2000. The percentage of residents in South Dakota completing four or more years of college has increased from 8.6 percent in 1970 to 14.2 percent in 1980 to 17.2 percent in 1990 to 25.7 percent in 2000. In 2000, the U.S. average was 25.6 percent.

Figure 2-9
Population in North Dakota and South Dakota from 1970-2000



DEMOGRAPHIC EFFECTS ON VISITATION

Increased outdoor recreation demands in the Oahe project area are anticipated. This expectation is based on the various demographic and economic indicators previously discussed in the profiles of the area of influence. The general conclusions and their applicability to recreation opportunities at Lake Oahe are presented below.

a. Population. The population in the Upper Oahe area increased 36.1 percent between 1970 and 2000, although most of this increase occurred in the first decade. This increase primarily was a result of growth in the relatively urban areas in Burleigh and Morton Counties. The population of the Lower Oahe and tertiary areas of influence have shown more modest increases.

According to the U.S. Census Bureau's population projections (based on 2000 census data), North Dakota's population will be approximately 729,000 in 2025, a 13.5-percent increase from the 2000 population of 642,200. South Dakota's population is projected to rise 14.7 percent from a 2000 population of 754,844 to approximately 866,000 in 2025. The effect of these anticipated increases in population will be an increased demand for recreational opportunities.

b. Age. Age is a major factor affecting participation in outdoor recreation, as shown in Tables 2-16 and 2-17. (Data from 2001 was used as participation rates for anglers, hunters, and wildlife watchers were more representative of long term average rates than was the case in 2006, which was a drought year with very low lake and river levels.) In North Dakota and South Dakota, involvement in hunting and fishing peaks in the 35 to 44 years age group. Participation in wildlife watching differed somewhat between the two states. While wildlife watching in North Dakota steadily increased with age and peaked in the 65 years and older age group, wildlife watching in South Dakota was relatively similar among age groups and was highest in the 35 to 44 years age group.

Table 2-16
Outdoor Recreation Participation by Age Group, North Dakota Residents

	Total State Population		**Anglers**		**Hunters**		**Wildlife Watchers**	
Age Group	Number	Percent	Number	Percent*	Number	Percent*	Number	Percent*
16 to 17 years	22000	5	8000**	34**	6000**	27**	…	…
18 to 24 years	52000	11	15000	29	11000**	22**	…	…
25 to 34 years	69000	14	28000	41	21000	30	19000**	28**
35 to 44 years	98000	20	39000	40	27000	27	25000**	25**
45 to 54 years	91000	19	25000	27	13000	14	26000**	28**
55 to 64 years	49000	10	17000	35	7000**	15**	24000**	50**
65 years and older	103000	21	11000**	11**	7000**	7**	34000	33

* Percent of State population participating
** Estimate based on small sample size
Source: 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation; USFWS and US Census Bureau

The median age of residents in the Oahe project area has been rising considerably as documented previously in this section. Although the increasing age of the average recreator at Lake Oahe may affect the popularity of different activities, the total demand for outdoor recreation at Lake Oahe by area residents may not decrease.

Table 2-17
Outdoor Recreation Participation by Age Group, South Dakota Residents

	Total State Population		Anglers		Hunters		Wildlife Watchers	
Age Group	Number	Percent	Number	Percent*	Number	Percent*	Number	Percent*
16 to 17 years	27000	5	10000**	38**	…	…	…	…
18 to 24 years	79000	14	14000**	18**	7000**	9**	…	…
25 to 34 years	80000	14	23000	29	18000**	23**	34000**	42**
35 to 44 years	102000	18	35000	34	24000	24	55000	54
45 to 54 years	105000	19	23000	22	18000	17	46000	44
55 to 64 years	55000	10	16000**	30**	8000**	14**	45000	82
65 years and older	112000	20	24000	21	10000**	9**	52000	46

* Percent of State population participating
** Estimate based on small sample size
Source: 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation; USFWS and US Census Bureau

The median age of residents in the Oahe project area has been rising considerably as documented previously in this section. Although the increasing age of the average recreator at Lake Oahe may affect the popularity of different activities, the total demand for outdoor recreation at Lake Oahe by area residents may not decrease.

In May 1986, Market Opinion Research conducted a study entitled “Participation in Outdoor Recreation Among American Adults and the Motivations Which Drive Participation” for the President’s Commission on Americans Outdoors. This study concluded that a majority of American adults (18 and over) consider themselves "outdoors" people. Members of the "baby boom" generation, born between 1946 and 1964, are predominantly individuals with active outdoor lifestyles. Because they constitute such a large percentage of all adults, their interests greatly influence general trends. Although the eldest of the baby-boomers are at an age when participation in active outdoor sports begins to decline, more of them continue participating in outdoor recreation than the previous generation did at that age. In the future, elderly baby boomers will probably place more demands on outdoor recreation facilities than those in older age groups do now.

Income. Based on income, the residents in the areas of influence of the Oahe project might be expected to have slightly lower than average demands for the more costly forms of outdoor recreation such as camping, boating, and fishing. The per capita incomes of North Dakota and South Dakota in 2006 were 89.5 and 87.3 percent of the U.S. average respectively, which was $25,267 (U.S. Census

Bureau 2008).

The 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation indicated that outdoor recreation participation was generally higher in households with higher income levels in North Dakota and South Dakota. For example, in North Dakota the greatest proportion of anglers (23%), hunters (19%), and wildlife watchers who traveled away from their home to watch wildlife (25%) consisted of people whose annual household income was $50,000 to $74,999. In South Dakota, the greatest proportion of anglers consisted of people whose household income was $30,000 to $39,999 (19%) while the greatest proportion of hunters (22%) and wildlife watchers (22%) consisted of people whose household income was $50,000 to $74,999. North Dakota was the fifth highest state in hunting participation rate in the 2001 National Survey of Fishing, Hunting, and Wildlife, in spite of low income. Rural areas tend to have much higher participation rates in hunting and fishing than urban areas.

Education. The 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation showed that participation in outdoor recreation varied according to education level. In North Dakota, the highest percentage of anglers (33%) and hunters (35%) had 1 to 3 years of college while the highest percentage of wildlife watchers (36%) had a high school education. In South Dakota, the highest percentage of anglers (34%), hunters (34%), and wildlife watchers (35%) consisted of those with a high school degree, although those with 1 to 3 years of college and 4 years of college or more were not far behind.

The educational level attained by residents within the three defined Oahe areas is comparable to that attained by residents of the United States as a whole. Of all adults at least 25 years of age in the States of North Dakota and South Dakota in 2000, 85.5 percent and 91.8 percent, respectively, had four or more years of high school compared to 84.1 percent in the United States as a whole. Those who attended four or more years of college in North Dakota and South Dakota were 22.6 percent and 25.7 percent, respectively, compared with the U.S. average of 25.6 percent.

ECONOMIC CHARACTERISTICS

INCOME AND EMPLOYMENT

Upper Oahe Area. People are drawn to reside in urban areas for a variety of reasons - increased job opportunities, proximity of primary and long-term care facilities, availability and variety of commercial goods and services, and so forth. This motivation for migration to urban areas is displayed in the differences in labor statistics for the counties. Table 2-18 lists the average 2000 population, per capita income, median family income, unemployment rates, and percent of families below poverty level for the seven Upper Oahe area counties, in alphabetical order for each state.

Table 2-18
Income and Employment Data, Upper Oahe Area

County	2006 Population	Per capita Income (1999)	Median Family Income (1999)	Percent Unemployment (2000)	Percent of Families Below Poverty Level (1999)
Burleigh (ND)	69,416	$20,436	$52,085	2.5	5.3
Emmons (ND)	4,331	$14,604	$31,857	1.9	14.7
Morton (ND)	25,303	$17,202	$44,952	2.6	6.8
Sioux (ND)*	4,044	$7,731	$24,000	13.7	33.6
North Dakota	642,200	$17,769	$43,654	3	8.3
Campbell (SD)	1,782	$14,117	$35,938	0.9	11.2
Corson (SD)*	4,181	$8,615	$23,889	6.8	32.8
Walworth (SD)	5,974	$15,492	$33,654	3.7	14.7
South Dakota	754,844	$17,562	$43,237	3	9.3

* Counties within the Standing Rock Sioux Reservation
Source: U.S. Census Bureau, Census 2000 and 2006 Summary File

Walworth and Burleigh Counties contain the cities of Mobridge, South Dakota and Bismarck, North Dakota, respectively. There are plenty of job opportunities in these areas because of the number of commercial and governmental enterprises. In contrast, Corson and Sioux Counties have no large towns, limited job opportunities, and therefore, experience significantly higher unemployment rates.

Urban Burleigh County enjoys a relatively diversified economy while job opportunities in rural counties, such as Sioux County, are less diversified (Table 2-19). The difference in job opportunities translates into big differences in income. According to the 2000 census, per capita income ranged from $7,731 in Sioux County to $20,436 in Bur leigh County. Median family income in those two counties was $24,000 and $52,085 respectively.

The tables in this section show that employment prospects are more limited in the rural counties and even worse in the reservation counties. In addition to the employment problems arising from remoteness and inaccessibility, the reservations have a greater percentage of young people of an age to enter the workforce for the first time.

Lower Oahe Area. On the average, unemployment is less in the Lower Oahe area than in the Upper Oahe area. Again, unemployment is lowest where there are larger communities and highest where the county is in an Indian reservation. Table 2-20 lists the 2000 population, per capita income, median family income, unemployment rates, and percent of families below poverty level for the seven Lower Oahe area counties.

Although urban Hughes County is more diversified than Ziebach County, a rural Lower Oahe county, the differences are less pronounced than in the comparison of Burleigh and Sioux Counties in the previous section (Table 2-20). Similarly, there is a disparity in incomes for the Lower Oahe area but it is not quite

Table 2-19
Percent of Civilian Employment by Industry
Urban Burleigh County, ND and Rural Sioux County, ND

Industry	Burleigh County, ND Population 69,416	Sioux County, ND* Population 4,044
Agriculture, forestry, fishing, and hunting	2.6	10
Arts, entertainment, and recreation	5	21.7
Construction	6.3	5.7
Education, health, and social services	23.2	32.4
Finance, insurance, real estate, rental, and leasing	6.8	1.8
Information	3.8	1.1
Manufacturing	4.6	0.9
Other services	5	2.8
Professional, scientific, and management	6.8	0.9
Public administration	9.2	16.6
Retail trade	13	3.7
Transportation, warehousing, and utilities	6.6	1.6
Wholesale trade	3.3	0.6

*County within the Standing Rock Sioux Reservation
Source: U.S. Census Bureau, Census 2000 Summary File

Table 2-20
Income and Employment Data, Lower Oahe Area

County	2006 Population	Per capita Income (1999)	Median Family Income (1999)	Percent Unemployment (2000)	Percent of Families Below Poverty Level (1999)
Dewey (SD)*	6,112	9,251	24,917	8.5	29.8
Haakon (SD)	1,864	16,780	35,958	2.4	12
Hughes (SD)	16,946	20,689	51,235	2	6
Potter (SD)	2,321	17,417	37,827	0.8	8.9
Stanley (SD)	2,815	20,300	47,197	1.2	6.6
Sully (SD)	1,435	17,407	38,304	1.3	10.6
Ziebach (SD)*	2,706	7,463	18,672	8.9	45.2
South Dakota	754,844	17,562	43,237	3	9.3

*Counties within the Cheyenne River Sioux Reservation
Source: U.S. Census Bureau, Census 2000 Summary File

as pronounced as in the Upper Oahe area. According to the 2000 census, per capita income for the seven Lower Oahe counties ranged from $7,463 in Ziebach County to $20,689 in Hughes County. Median family income in those two counties was $18,672 and $51,235 respectively (Table 2-21).

Table 2-21
Percent of Civilian Employment by Industry
Urban Hughes County, SD and Rural Ziebach County, SD

Industry	Hughes County, SD Population 16,481	Ziebach County, SD* Population 2,519
Agriculture, forestry, fishing, and hunting	4	19.6
Arts, entertainment, and recreation	7.4	3.5
Construction	8.1	4.1
Education, health, and social services	19.3	31.4
Finance, insurance, real estate, rental, and leasing	5.4	5.3
Information	3	2.8
Manufacturing	1.5	0.7
Other services	4.3	1.3
Professional, scientific, and management	5.1	2.7
Public administration	23.3	13.4
Retail trade	12.5	9.6
Transportation, warehousing, and utilities	4.2	4.1
Wholesale trade	1.7	1.5

*County within the Cheyenne River Sioux Reservation
Source: U.S. Census Bureau, Census 2000 Summary File

Tertiary Area. In 2000, the per capita incomes of $17,769 in North Dakota and $17,562 in South Dakota were 82.3 and 81.4 percent, respectively, of the average $21,587 per capita income for all 50 States. As shown previously in Table 2-18, in North Dakota 8.3 percent of all families had incomes below the poverty level while in South Dakota 9.3 percent of families had incomes below the poverty level. Nationwide, 9.2 percent of all families had incomes below the poverty level (U.S. Census Bureau 2000). On the other hand, unemployment rates have consistently been lower than the national average, and less given to extremes. In 2000, the U.S. annualized unemployment rate was 3.7 percent, while in both North Dakota and South Dakota the rate was 3.0 percent (U.S. Census Bureau 2000). Services (including those involving tourism), government, and agriculture are three primary sources of earnings for the inhabitants of both North Dakota and South Dakota (Table 2-22).

TOURIST EXPENDITURES

The North Dakota Department of Commerce reports that in 2004 nearly 5.7 million overnight trips were in North Dakota (NDDC 2006). Total 2005 travel expenditures in North Dakota were over $3.4 billion. These expenditures were estimated to be responsible for 31,250 jobs.

The South Dakota Department of Tourism reports over $809 million in total visitor expenditures in 2005 (SDDT 2006). This expenditure was estimated to have a $2.02 billion impact on South Dakota's economy (SDDT 2006).

In 2005, a total of 33,590 South Dakota jobs were tourism related (SDDT 2006). About 75 percent of any

Table 2-22
Percent of Civilian Employment by Industry,
North Dakota and South Dakota

Industry	North Dakota Population 642,200	South Dakota Population 754,844
Agriculture, forestry, fishing, and hunting	8.2	8.1
Arts, entertainment, and recreation	8.2	8.3
Construction	6.2	6.3
Education, health, and social services	24.2	22
Finance, insurance, real estate, renal, and leasing	5.9	7.4
Information	2.3	2.1
Manufacturing	7.1	11.1
Other services	4.9	5.1
Professional, scientific, and management	6	5
Public administration	4.8	4.8
Retail trade	12.7	12
Transportation, warehousing, and utilities	5.7	4.7
Wholesale trade	3.7	3.3

Source: U.S. Census Bureau, Census 2000 Summary File

job creation in the visitor industry occurs in the sectors directly impacted by visitor spending. These sectors include retail trade, transportation, food and beverage, lodging, and amusement. The remaining 25 percent of new jobs occur in a variety of sectors via induced employment impacts.

Sport Fishing and Hunting. In 2006, the most recent National Survey of Fishing, Hunting, and Wildlife-Associated Recreation was published by the FWS and the U.S. Census Bureau. This survey is published every 5 years and quantifies the economic impact of wildlife-based recreation for the nation and for individual states.

According to the 2006 North Dakota and South Dakota surveys, the total expenditures on sport fishing, including trip-related expenditures such as food, transportation, and lodging, and equipment expenditures, amounted to $93.7 million in North Dakota and $131.1 million in South Dakota (USFWS/ US Census Bureau 2006). Of the $93.7 million in North Dakota, $70.7 million was spent by residents and $23.0 million was spent by nonresidents. Of the $131.1 million in fishing expenditures in South Dakota, $109.5 million was spent by residents and $21.6 million was spent by nonresidents. The comparison between resident and nonresident expenditures is important. Nonresident expenditures represent an injection of outside money into the economy.

The 2006 FWS and Census Bureau survey measures the direct impacts of fishing expenditures. However, the American Sportfishing Association (ASA) also considers induced and indirect economic

impacts if fishing. Induced and indirect economic impacts refer to the secondary or multiplier effect resulting from an expenditure in a specific area or economic region. For example, if a fisherman comes to a lake from outside the area and buys tackle, bait, meals at restaurants, etc., these expenditures would stimulate the area economy. To the extent the fishing supplies and meals are products of the area, the economy is further stimulated when the resulting profits and wages are spent within the economy. The money will work through the economy and result in an increase of economic activity greater than the initial stimulus (purchase of fishing supplies and meals). The ASA adds the induced and indirect impacts caused by the original expenditure to the direct impacts of the expenditures to calculate total output. The ASA calculated that fishing produces $302.8 million in output in North Dakota and $350.9 million in output in South Dakota (ASA 2003). The ASA estimated that this output created 3,174 jobs with wages and salaries of the $65.3 million for the State of North Dakota and 4,332 jobs with earnings of $86.8 million for the State of South Dakota (ASA 2003).

According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, the total expenditures on hunting, including trip-related expenditures such as food, transportation, and lodging and equipment expenditures, amounted to $129.1 million in North Dakota and $185.3 million in South Dakota. Of the $129.1 million in hunting expenditures in North Dakota, $83.2 million was spent by residents and $45.9 million was spent by nonresidents. Of the $185.3 million in hunting expenditures in South Dakota, $80.1 million was spent by residents and $105.2 million was spent by nonresidents.

The detailed data from 2006 is not collected every year. Therefore, the data appears to be somewhat outdated but it is still useful in presenting the magnitude of the impact of fishing and hunting in North Dakota. Likewise, there are many other forms of recreation that are also important. Fishing and hunting are important forms of recreation in terms of participation and economic impact. The amount of research concerning fishing and hunting activities serves to illustrate the impact of recreation in general. The research also provides examples of the importance of recreation in the region and trends in participation.

TAX REVENUE

The North Dakota Department of Commerce reports that over $2.5 million in local tax revenue, $1.4 million in State lodging tax revenue, and $1 billion in arts, entertainment, recreation, accommodations and food service taxes revenue were generated by travel in North Dakota in 2005 (NDDC 2006). Local receipts consist of room taxes, city sales taxes, and any additional lodging or restaurant taxes levied. State receipts include State sales tax, State gasoline tax, and corporate and personal income taxes that result from travel-related business.

The South Dakota Department of Tourism reports sales tax receipts from visitor spending amounted to $22.1 million in 2005 and State gasoline tax receipts, attributable to visitor spending, produced another $23.3 million (SDDT 2006). The sales tax receipts represent a 3.5-percent increase over 2004. The state gasoline tax receipts did not change from 2004.

Sport fishing is only one activity available at the Oahe project; however, it is covered in detail because of

the enormous impact this type of recreation has on the local economy.

Tax Revenues from Sport Fishing. The ASA investigated the impact of sport fishing on various tax revenues in North Dakota and South Dakota for 2003 (ASA 2003). This report estimated that the 2003 impact of sport fishing in North Dakota on state sales/fuel taxes was $10.6 million; on State income tax, $671,366; and on Federal income tax, $6.6 million. The 2003 impact of sport fishing in South Dakota on State sales/fuel taxes was $11.9 million; on State income tax, $0; and on Federal income tax, $8.7 million.

Sales tax revenues. In 2007, North Dakota and South Dakota had 5 percent and 4 percent state sales taxes, respectively, and taxes on gasoline and diesel fuel of 23 cents per gallon and 22 cents per gallon, respectively (North Dakota State Government 2007, South Dakota State Government 2007a, 2007b). It was estimated that sales and fuel taxes directly attributable to sport fishing contributed $10.6 million to the economy of North Dakota and $11.9 million to the economy of South Dakota in 2003 (ASA 2003).

Income tax revenues. The ASA estimated that the total annual addition to State income tax revenues from sport fishing was approximately $671,366 in North Dakota in 2003. As of this writing, South Dakota has no income tax.

Fishing license revenues. In fiscal year 2005, 129,325 fishing permits were issued to North Dakota state residents, providing $1.07 million in revenue. A total of 34,897 fishing permits were issued to nonresidents, providing $514,075 in revenue (NDGF 2006b). In fiscal year 2005, 73,024 fishing permits were issued to South Dakota residents and 59,351 fishing permits were issued to nonresidents (SDGFP 2006b). Revenue from fishing on the Missouri River is about $25 million/year (SDGFP 2006b).

Excise tax revenues. Another source of revenue comes from the U.S. Treasury from excise taxes on certain fishing tackle items and boat fuels. This revenue is apportioned to the individual States and is to be used to enhance sport fishing in accordance with the Wallop-Breaux Amendment. In 2006, North Dakota received $3.2 million (NDGF 2006b) and South Dakota received $3.6 million in excise tax revenue (SDGFP 2006b).

Hunting License Revenues. In fiscal year 2005, 466,560 hunting permits were issued to North Dakota state residents, providing $4.5 million in revenue. A total of 153,726 hunting permits were issued to nonresidents, providing $5.3 million in revenue (NDGF 2006b). In fiscal year 2005, 393,570 hunting permits were issued to South Dakota state residents, providing $9.8 million in revenue. A total of 191,459 hunting permits were issued to nonresidents, yielding $15.8 million in revenue (SDGFP 2007c). Hunting also generates other tax revenue whether from sales, income, or other taxes. This is true of the other forms of recreation also.

ECONOMIC IMPACTS

There is a direct conflict between providing adequate flows to support several other congressionally authorized purposes and recreation, particularly water-based recreation including fishing and boating, in the large upper three main stem reservoirs including Lake Oahe. During high and normal runoff periods when the three large reservoirs are at normal or above-normal reservoir levels, there is enough water so this conflict is minimized.

During prolonged drought periods when water is released for downstream flow support for water supply, navigation, powerplant cooling, downstream river recreation, and water quality, there is a conflict with reservoir recreation at the Fort Peck, Garrison, and Oahe projects. This conflict applies at the upper three large reservoirs because they are the only main stem projects that have Carryover and Multiple Use Zone storage drawn from during drought, or below-normal water supply periods. The Federal Government has provided funds for extending or constructing boat ramps to provide additional or improved access when the upper three reservoirs have been at lower levels during the two drought periods previously discussed. Although this has improved the situation somewhat, reduced recreation benefits at these reservoirs during drought will continue to be an issue until the recreation facilities are adjusted to function at the lower reservoir levels or alternative recreation opportunities are provided during drought periods.

RECREATION

RECREATION FACILITIES

Corps-owned recreation facilities at Lake Oahe vary from well-developed campgrounds to primitive areas with few facilities. In accordance with the Land and Water Conservation Fund Act (LWCF) of 1965, the Corps is required to charge a recreation user fee for the use of facilities and services at campgrounds and group camp areas managed by the Corps. The revenue from the user fee program is used to sustain the operation and maintenance of the recreation facilities. However, in accordance with Public Law 96-154 (94 Stat. 2960), the revenue on or after 13 December 1980 is returned to the U.S. Treasury to be used for any or all purposes authorized by the LWCF without regard to the source of such revenue.

For several reasons, most development of intensive-use recreational facilities has originally been concentrated on the east side of the lake. These reasons include the gentler topography, better road access, and perhaps most importantly, population base, which is primarily to the east. However, in recent years several new facilities have been built on the west side. The areas of Walker Bottom (next to Prairie Knights Casino), Fort Rice, and Graner also have new facilities.

There are four areas on the west side of Lake Oahe that have been designated as Future Recreation Area. They are Blackhawk Creek Lake Access and Singing Bridge Lake Access Points in Corson County South Dakota; and the Bender Bay and Blackfoot Lake Access Points in Dewey County, South Dakota. Also on the west side of Lake Oahe, the Standing Rock Sioux Tribe has also expressed a strong interest in pursuing plans to develop a day use recreation area at Four Mile Bay along with several scenic and

historic areas along the shoreline.

RECREATION ACTIVITIES AND NEEDS

Both North Dakota and South Dakota have an abundance of natural and scenic resources. Because of these resources, recreation is an important part of the future of these two states. The relatively high rates of participation in fishing, hunting, and a wide variety of other outdoor activities demonstrate the popularity of outdoor recreation. However, both States recognize the need to seek a balance between use and protection of these vital resources.

A wide assortment of resources, facilities, and programs provide diverse and quality outdoor-recreation opportunities for residents and tourists. Approximately 80 percent of the visitors to Lake Oahe engage in water-based recreation activities and 54 percent participate in land-based recreation activities (USACE 2006a).

Fishing. Fishing is the major recreational activity of visitors to the Oahe project, with 44 percent of visitors engaging in this activity (USACE 2006a). Lake Oahe offers a tremendous opportunity for fishing in central South Dakota and south-central North Dakota because of the number of fish species, most of which are native to the Missouri River system. Nearly 30 species of fish provide anglers a variety of fishing adventures throughout Lake Oahe.

The most sought-after game fish at Lake Oahe is the walleye which can be taken virtually any time of the year. There normally are several walleye tournaments held on the North Dakota portion of Lake Oahe each year (NDGF 2006c). Because of the drought, North Dakota held only one walleye tournament in 2003 and no walleye tournaments were held from 2004-2006. More walleye tournaments are held on the South Dakota portion of Oahe. In 2006, 42 walleye tournaments were held, a typical amount for South Dakota (SDGFP 2006b).

Although walleyes may be in greatest demand on Lake Oahe, other species that attract visitors include Chinook salmon, northern pike, smallmouth bass, white bass, and channel catfish (SDGFP 2006b).

Hunting. The Lake Oahe area is an important regional resource for hunting. Hunting accounts for about 5 percent of the overall visitor use on project lands (USACE 2006a). The NRMS surveys were conducted only in designated recreational areas. Most hunters do not use these areas, preferring instead more isolated and primitive areas.

The primary big game species in the Lake Oahe area include the white-tailed deer (along the bottomlands and shoreline of the lake) and mule deer (over the remaining project area). Some pronghorns may be found on project lands but this species is usually limited to those lands west of Lake Oahe.

Perhaps the most sought-after species of upland game bird is the ring-necked pheasant. The scattered wetland areas, sloughs, woody draws, and State-operated game production areas provide excellent

hunting opportunities throughout the project area.

Sharp-tailed grouse, prairie chicken, and Gray partridge can also be found on project lands. The prairie chicken is found most often in the southern portion of the Oahe project while grouse and partridge are found most often on the northern rangeland portions of the project. Turkey, another popular game bird, are often taken in the bottomlands around the Moreau, Grand, Cheyenne, and Cannonball Rivers; MacLean and Kimball Bottoms; Beaver Creek; and Badger Bay.

The Oahe project has excellent waterfowl hunting because of its location in the Central Flyway, the direct migration route for thousands of geese and ducks that make their way each year from Canada to Central and South America. The creation of the Missouri River reservoirs, including Lake Oahe, attracts more water birds to the state, especially during migration and winter (Tallman et al. 2002).

Mallards, Canada geese, and teal are popular waterfowl species with hunters. Because there is not enough public hunting in the Pierre area, the Oahe project offers valuable public waterfowl hunting opportunities and large numbers of hunters use project lands. The Mobridge area south to Pierre is especially popular because the open water in this area attracts large numbers of waterfowl. Waterfowl that use to fly farther south before the dams now tend to stay in the open water areas downstream of the dams.

Camping. Camping is a popular and important activity in both North Dakota and South Dakota. Approximately 7 percent of visitors to Lake Oahe camp (USACE 2006a). Although the Corps owns a variety of campgrounds around Lake Oahe in North Dakota, most of the Oahe campgrounds in South Dakota have been transferred to either the SDGFP or the CRST under Title VI. The only Corps-owned recreation area in South Dakota that includes a campground is the Downstream Recreation Area. Highly developed campsites (such as those in the Downstream Area) are used as destination areas. On high-use weekends, these campgrounds are often near capacity. As a high resource-oriented activity, primitive camping takes place most often in areas where large amounts of undeveloped public land are available. Most of the primitive camping at Lake Oahe is associated with hunting and fishing trips. In spite of the availability of facilities, there is a demand for improved facilities at various recreation areas. The facilities do not match modern demand and need to be updated and modernized.

Primitive camping may be associated with hunting and fishing trips away from home, but there are a number of individuals who actively seek a primitive camping experience to enjoy solitude and nature or who want an alternative to the campground environment. These recreators are not very visible, vocal, or easily identified. Therefore, their needs are sometimes overlooked. Fortunately, Lake Oahe has numerous areas for primitive camping. These areas range from developed campgrounds with no electricity or sewer system to areas with very few amenities in addition to a vault toilet.

Boating. Boating activities are enjoyed by a large proportion of the visitors coming to Lake Oahe, with 30 percent of visitors participating in boating (USACE 2006a). With the excellent fishery at

Lake Oahe, much of the boating is related to fishing activities. However, sailboating, waterskiing, wind surfing, tubing, jet skiing, and power boating are also popular activities.

The river connecting major marina areas in Pierre, Mobridge, and Bismarck and all recreation areas in between provides for unique and complementary recreational opportunities. In addition, the size of the waterway fosters an appreciation and awareness of the project's size and its many qualities and attractions. However, the launching of watercraft of all types is to be undertaken at approved locations so as not to interfere with cultural resource enforcement, threatened and endangered species nesting, or agricultural leases.

The increasing popularity of larger boats with deep-draft hulls designed to remain in the water during the recreation season is creating a demand for expanded marina facilities. Fuel and harbor accommodations in the vicinity of the dam are planned to permit and encourage pleasure-craft navigation on Lake Oahe. The potential also exists for the development of additional marina facilities at other locations on Lake Oahe.

Fluctuations of the water level can occur at Lake Oahe and rehabilitation or construction of boat ramps is sometimes necessary. Fluctuating water levels may also increase the hazards in open water. Some areas, particularly north of Mobridge, have partially submerged trees, islands, sandbars, or other hazards that are deeply submerged during periods of high water levels. During drought conditions, boaters have difficulty keeping silt off of boats and may encounter boat ramps that are above the water level, making it impossible to launch their boat.

With the national attention Lake Oahe has received in various sporting magazines, residents and visitors have developed a great appreciation of the opportunities offered by Lake Oahe. Power boating, waterskiing, sailboating, jetskiing, and sailboarding are all expected to increase in popularity in the near future.

Trail Activities. Recreation trails have emerged as one of the most popular outdoor-recreation facilities in both North Dakota and South Dakota. The wide variety of activities that the trails compliment contributes to their popularity. Walking, jogging, hiking, bicycling, and cross-country skiing are common activities. The trail activities can be done alone or in groups for pleasure or transportation. There are several different types of trails within the Oahe project area.

- Hiking/Biking Trails. The trail along Highway 1806 from the southern project boundary to the downstream campground is a partnership between the City of Fort Pierre and Oahe Project. This was initiated by the seed money from the Headquarters Challenge Partnership program and a grant from the City of Fort Pierre and the South Dakota Department of Transportation. This entire Pierre/ Fort Pierre trail system is called the "Lewis and Clark Trail". This section was the last section that connected Farm Island State Recreation Area with the downstream recreation areas and the trails in Pierre and Fort Pierre.

- Nature Trails. There are six nature trails on or in the vicinity of the Oahe Dam/Lake Oahe

project. The Cottonwood Path Nature Trail is located in the Downstream Recreation Area. This quarter-mile long trail was developed in the floodplain forest to provide interpretation of some ecological characteristics of the area. The nature trails at Beaver Creek Recreation Area and General Sibley Park meander through uplands and riparian areas, respectively. The Sibley Nature Park contains a 3/4-mile long nature trail that runs through a remnant bottomland forest. There is moderate use of all of these nature trails by individuals and family groups.

- Offroad Vehicle Trails. The increased use of ORV's nationwide has necessitated the development of special areas for these vehicles. At the Oahe project, there are two areas designated for ORV use. These areas are located at the West Shore Recreation Area and on the outer edges of the Kimball Bottom Recreation Area. These areas receive significant use by local clubs as well as individuals and small groups.

Picnicking. About 4 percent of visitors to Lake Oahe go picnicking (USACE 2006a). Picnic facilities are available at most of the recreation areas. Overall, the picnic facilities meet basic picnicking needs, but there are some individual areas requiring additional facilities. Current trends favor large group events. The creation of new picnic areas and the upgrading of existing ones with facilities such as shelters, playgrounds, and potable water are recommended. Development of additional facilities is discussed within the specific management units identified in chapter 6.

Sightseeing. The beauty of the surrounding area makes the Oahe project attractive to sightseers, and 22 percent of visitors sightsee (USACE 2006a). Individuals are recorded as sightseeing only if they did not participate in any other activity such as camping, boating, or fishing. Although many of the visitors to Lake Oahe participate in sightseeing, many do so as secondary or tertiary activities. The peace, solitude, and beauty of the area are attractive to numerous sightseers.

For this discussion, sightseeing also includes wildlife viewing and photography. The Oahe project affords numerous opportunities for these activities. Lake Oahe is essentially along the dividing line between the eastern and western United States. This project harbors many prairie and wetland bird species. Woody vegetation indigenous to both the eastern and the western U.S. may be found along creek drainages or woody draws. The numerous wetland areas and embayments, waterfowl refuges, and the stark rangeland afford the chance to photograph many inviting vistas. Bald eagles, ducks, and geese migrate through the Oahe area on their way to and from breeding grounds in Canada. In addition, many opportunities exist for photographing big game species or fishing catches.

Swimming. Swimming is a popular activity at Lake Oahe, with roughly 6 percent of the visitors participating during the summer months (USACE 2006a). Designated swimming areas marked with buoys are located in the Downstream and Beaver Creek Recreation Areas. In other areas around the lake, many visitors swim and sunbathe along the shoreline in undesignated locations at their own risk. Water quality is always a concern and must be monitored regularly to assure public health and safety.

Pow wows. The Pow Wow Grounds in the Oahe Downstream Recreation Area are located in a perpetual lease area (SDGFP) on lands retained by the Corps. Both the Cheyenne River Sioux and the Standing Rock Sioux Tribes regularly hold pow wows and other recreation-related activities that help to build social cohesiveness in their community. Even though these powwows are not held on Corps property, many people attending the events as participants and tourists do use Corps recreation facilities. Two new facilities will likely help attract visitors to Corps recreational facilities. The United Sioux Tribes powwow grounds were completed in 2005 near the Downstream Recreation Area. The Wakpa Sica Reconciliation Place, located near Fort Pierre, South Dakota, is a multi-purpose facility that will eventually include the Sioux Nation Supreme Court, Native American Mediation Training Center, an economic development center, a cultural center, an outdoor festival area, and a native prairie interpretive area. Facilities will be constructed as funds become available.

VISITATION PROFILE - TRENDS AND DEMANDS

Each of the Missouri River reservoirs is unique in its own way and Lake Oahe is no exception. The varying topography, the fishery and hunting resources, the proximity to population centers, and the amount of recreation facility development all combine to make the Oahe project a major asset to the central Great Plains. Lake Oahe offers some of the best walleye fishing on the Missouri River. Hunting opportunities are abundant because of the excellent and varied habitat located throughout the project. Because the project is located in the central portion of two States, it provides easy access for both North Dakota and South Dakota residents and visitors. All of these components contribute to the visitation patterns observed at the Oahe Dam/Lake Oahe project.

PROJECT VISITATION

Table 2-23 shows the annual visitation to the Oahe project for monitored recreation areas and wildlife management areas from 1987 through 2006. Visitation is reported by visitor-hours based on raw vehicle counts. The presence of one or more persons on an area of land or water for the purpose of engaging in one or more recreation activities during continuous, intermittent, or simultaneous periods of time aggregating to 60 minutes is known as a visitor-hour. Visitor-hour incorporates both the number of participants and duration of use and provides an estimate on the "amount" of use.

As can be seen, the 2006 visitation for the Oahe project was 7,386,017 visitor-hours. Visitation to designated recreation areas accounted for approximately 5,859,700 visitor-hours or roughly 95.8 percent of total visitor hours. The remaining 4.2 percent of the visitation is the estimated amount of dispersed recreational use (dispersed use is the type of recreation that occurs in those parts of the project that are not designated recreation areas, for example, from people who walk or bike on the project). Although there was a drop in visitation during the drought years of 1990-92, visitation at the Oahe project increased in 1993-94 during a fishing boom. Visitation remained high through the rest of the 1990s but started to drop in 2000 with the beginning of a drought that lowered lake water levels. Visitation shows a drop following the transfer of most South Dakota recreation areas from the Corps to the SDGFP and CRST in 2002, as

Table 2-23
Annual Visitation at the Oahe Project

Year	Visits	Visitor-Hours
2000	1,596,389	14,623,190
2001	398,266	2,643,887
2002	1,561,173	9,597,573
2003	1,394,181	7,932,788
2004	1,378,757	7,140,017
2005	1,450,540	7,700,654
2006	1,406,894	7,386,017
2007	1,416,506	8,045,455
2008	1,569,400	9,641,342
2009	1,670,112	9,273,397

Source: Visitation reports, U.S. Army Corps of Engineers, Omaha District, Operations Division.

the Corps no longer reports visitation at these areas.

When compared to other lakes on the Missouri River main stem, Lake Oahe recorded the highest number of visitor hours for 2000 (Table 2-24). In fact, visitation at the Oahe project accounted for 24.0 percent of the total visitation to the main stem system. However, when taking into account the number of shoreline miles, Oahe is in the bottom half of the main stem projects as having the least number of visitor-hours per shoreline mile. This indicates that although Lake Oahe is heavily used, the size of the project greatly decreases the overall visitor density. That is to say, there is plenty of open space for all types of recreation.

Table 2-24
CY 2000 Main Stem Visitation*

Project	Visitor-Hours	% Total V-hours	Miles of Shoreline	Visitor-hour per Shoreline Mile
Fort Peck	5,946,100	10	1,520	3,900
Garrison	16,555,900	27	1,300	12,400
Oahe	14,623,200	24	2,250	6,500
Big Bend	5,261,800	9	200	26,300
Fort Randall	9,752,300	16	540	18,100
Gavins Point	8,756,400	14	90	97,300

* Rounded to nearest hundred.

VISITATION SURVEYS

The most recent recreation use survey at Lake Oahe was conducted during the summer of 1992. Survey questions were divided into two specific types - those pertaining to the Oahe project as a whole and those

pertaining to specific recreation areas. The survey information not only reveals place of residence and destination of visitors but also the average length of stay, the average number of visitors per vehicle, and the specific type of recreation activity in which visitors participated.

According to both the North Dakota SCORP and South Dakota SCORP, visitation is projected to increase with visitors coming from a larger area. On the average, these visitors will travel farther and stay longer than local users. Much of the use of the project is by travelers en route to the Black Hills, Yellowstone, or other destination recreation attractions although a significant number of users come for the fishing and hunting opportunities. An aggressive marketing campaign by both States along with the diversified recreation facilities and opportunities could aid in increasing the visitation to the project.

However, if record high gas prices experienced nationally at the time of this writing continue in future years, visitation to the project may be negatively affected. Some travelers from nearby states may vacation closer to home and be less likely to drive to Lake Oahe. In a June 2006 USA Today/Gallup poll, 33 percent of respondents said they would be changing their travel plans in order to save gas money, 28 percent said gas prices would not affect their travel plans, and 38 percent said they had not planned to travel much anyway, regardless of gas prices (Polling Report 2006).

Alternatively, local residents who choose to vacation closer to home because of high gas prices may be more likely to visit Lake Oahe. In addition, North Dakota and South Dakota can use marketing campaigns to offset the effect of high gas prices. For example, in 2006 the South Dakota Office of Tourism held an ethanol fuel promotion titled "Twenty Bucks for the Road" that encouraged potential visitors from Colorado, Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Texas and Wisconsin to visit the state travel website (www.TravelSD.com) and sign up to receive a $20 voucher towards the purchase of ethanol blended fuel.

VISITOR DISTRIBUTION

In order to analyze the distribution of visitors at Lake Oahe, the lake was divided into three areas: South Dakota, North Dakota, and dispersed use. Table 2-25 shows the amount of visitation received at each Corps-owned recreation area during 2009.

The recreation areas in South Dakota accounted for approximately 2,777,890 of the visitor hours to the Oahe project. Visitors to this area were primarily fishermen and campers. Local use from the Pierre area is high although a considerable number of visitors come from Sioux Falls and Rapid City, South Dakota. The origin of the majority of the visitors were from south and east of the project, including southeastern South Dakota, Iowa, Nebraska, and Minnesota.

The North Dakota area (extending from the State line to the northern project boundary near Bismarck) accounts for 3,814,405 of the total project visitor hours. Visitors to the area are primarily fishermen and hunters. The popularity of General Sibley Park probably is due to its close proximity to an urban center, the State capitol, and Interstate 94. The greatest number of visitors to the North Dakota area are from

Table 2-25
2009 Visitation to Corps Owned Lake Oahe Recreation Areas[1]

Recreation Area	2009 Visits	2009 Visitor Hours	2009 Visitor Days
SOUTH DAKOTA			
Downstream[2]	177,383	1,735,664	144,639
West Shore[3]	89,003	21,591	17,799
East Shore[4]	46,902	87,848	7,321
Grand River	14,320	22,806	1,901
Indian Memorial	183,517	909,981	75,832
Subtotal	511,125	2,777,890	247,492
NORTH DAKOTA			
Langelier Bay	5,489	25,071	2,089
Cattail Bay[5]	15,533	100,430	8,369
Beaver Creek	59,429	678,947	56,579
Badger Bay	1,657	7,336	611
Hazelton	37,485	348,324	29,027
MacLean Bottoms	47,049	171,573	14,298
Kimball Bottoms[6]	50,057	171,532	14,294
Sibley Nature Park	4,265	6,422	535
General Sibley Park	121,979	1,618,710	134,893
Little Heart	12,249	105,692	8,808
Grainer Park	42,101	381,468	31,789
Fort Rice	22,705	87,992	7,333
Walker Bottom	15,763	46,987	3,916
Fort Yates	28,417	63,921	5,327
Subtotal	464,178	3,814,405	317,868
DISPERSED USE			
	37,967	227,829	18,968
TOTAL	1,013,270	6,820,124	584,328

[1] Rounded to the nearest hundred.

[2] Includes Downstream Recreation Area, East and West Tailrace Areas, and Powerplant.

[3] Includes West Shore Recreation Area, West Shore Overlook, Archery Range, Rifle Range, ORV Area, Stilling Basin, and Echo Point.

[4] Includes East Shore Recreation Area, East Shore Overlook, and Visitor Center

[5] Includes Cattail Bay Recreation Area and Winona Island.

[6] Includes Kimball Bottom Recreation Area and Kimball ORV Area.

Burleigh and Morton Counties, North Dakota, but the remaining visitors come from all over the State, as well as other parts of the United States.

CARRYING CAPACITY

Carrying capacity is a concept that denotes the limit of use for some particular purpose. A pasture will "carry" only a limited number of animals for a given time without suffering damage sufficient to reduce future capacity. Similarly, the recreational carrying capacity of an area is thought of in two ways - "social" capacity and "resource" capacity.

Social capacity is the level of density beyond which the user does not achieve a reasonable level of satisfaction. For example, the social capacity of a given area is typically much greater for a swimming beach than a golf course. The social capacity at Lake Oahe is most frequently limited by the level of recreational facility development, such as parking spaces and restrooms, or by the expectations of the different recreational users. The density of the existing facilities at Lake Oahe is generally appropriate for the region and social capacity limits in most areas are rarely reached. The sites with higher carrying capacity and accessibility are ordinarily classified as "Recreation" or "Project Operations" lands. Areas where additional facilities are needed are primarily in the vicinity of the dam.

Resource capacity is the level of use beyond which irreversible biological deterioration takes place or degradation of the resource makes it unsuitable or unattractive for recreational use. Resource capacity is usually a seasonal or long-term issue, as most areas will tolerate some short-term overuse without significant adverse effects. The resource capacity of the Oahe project is typically controlled by factors such as the presence of nesting sites, highly erodible soils, or steep terrain. Resource capacity must be accommodated in the design and location of facilities, as well as the regulation of use. Areas with low resource capacity are classified as “Environmentally Sensitive,” “Wildlife Management,” or “Multiple Resource Management” lands.

Detailed information on the resource base is being obtained and mapped as part of the OMP process. As improved visitation and user information is obtained through surveys, the data can be combined with the OMP resource data to determine specific improvements at those areas with the highest visitation and for those sites that may be used more extensively in the future.

ACTIVITY MIX

The relative frequency of participation in various activities at the Oahe Dam/Lake Oahe project is estimated each year. The annual activity mix is presented in Table 2-26. The total is greater than 100 percent because many people participated in more than one activity at a given recreation area.

Although the annual participation rate for hunting is listed as 4.9 percent, the number is deceiving. There are numerous roads with which to access Oahe project lands. Most of these roads do not have traffic counters on them. In the fall, hunters make up as much as 60 to 80 percent of the total visitation. Therefore, the seasonal hunting total is considerably higher than 4.9 percent

Table 2-26
Activity Mix, Lake Oahe, 2005

Activity	Annual Participation Rate (percent)
Camping	7
Picnicking	3.6
Boating	30
Fishing	43.9
Hunting	4.9
Water-skiing	0.6
Swimming	5.6
Sightseeing	22
Other	16.1
Total	**133.7**

Source: USACE 2006

RECREATION DEMAND

In 2005, North Dakota's most visited park was Fort Abraham Lincoln, located on the Missouri River south of Mandan (NDPR 2006). Fort Abraham Lincoln is home to the restored Custer House and has developed into one of the State's major attractions. As such, there is a need for additional camping facilities in the area as well as for the maintenance and renovation of existing facilities. In 2009 Icelandic State Park was the most visited with Fort Abraham Lincoln coming in second. (NDPR 2009)

In 1988, Recreation Management Opportunities, Inc. developed a report for the State of South Dakota entitled "Market Analysis and Feasibility of Recreation and Tourism Development of the Missouri River Basin in South Dakota" (hereafter referred to as the "RMO Study"). This study as well as the latest South Dakota SCORP identified the need for additional marina/harbor facilities on Lake Oahe. The increased popularity of larger boats that are designed to remain on the water and are not easily hauled on a trailer is creating a need for these facilities (SDDT 2006).

RELATED RECREATIONAL, HISTORICAL, AND CULTURAL AREAS

The major recreation areas and tourist attractions located within a 60-minute drive of Lake Oahe are listed in Table 2-27. These attractions tend to be grouped at both ends of the lake and are either directly or indirectly related to the history of the Great Plains. Fishermen, who make up the largest category of Lake Oahe visitors, are generally not interested in sightseeing. However, sightseers (who make up roughly 22 percent of the visitation) may be interested in visiting area attractions. Nearby recreation areas and attractions may also constitute side trips for campers either during inclement weather or to vary their recreational experience.

Table 2-27
Attractions, Events, and Recreation Areas within a 60-Minute Drive of Lake Oahe

Attraction	County	Type
SOUTH DAKOTA		
South Dakota State Capital, Pierre	Hughes	Historical
South Dakota Cultural Center, Pierre	Hughes	Historical/Cultural
Discovery Center, Pierre	Hughes	Science/Rec.
War Memorial, Pierre	Hughes	Historical
Verendrye Monument, Fort Pierre	Stanley	Historical
South Dakota Cowboy Hall of Fame, Fort PierreVerendrye Museum, Fort Pierre	Stanley	Historical
Cheyenne River Sioux Annual Powwow, Eagle Butte	Dewey	Cultural
Lake Sharpe	Stanley, Hyde, Lyman, Hughes, Buffalo	Recreation
Houck's Buffalo Ranch	Stanley	Recreation
Native American Scenic Byway	Corson	Historical/Cultural
Fort Manuel	Corson	Historical/Cultural
Grand River Casino	Corson	Recreation
NORTH DAKOTA		
Prairie Knights Casino	Sioux	Recreation
Fort Rice State Historic Site	Morton	Historical/Cultural
Huff Indian Village State Historic Site	Morton	Historical/Cultural
Huff Ski Resort	Morton	Recreation
Buggies N Blues	Morton	Recreation
Rodeo Days/Art in the Park	Morton	Recreation
Raging Rivers Water Park	Morton	Recreation
N.D. State Railroad Museum	Morton	Historical
Bismarck Zoo	Burleigh	Recreation
Buckstop Junction	Burleigh	Historical/Recreation
Lewis and Clark Riverboat	Burleigh	Recreation
Double Ditch	Burleigh	Cultural
Fort Mandan Lewis and Clark 1804 Encampment	McLean	Historical
Sitting Bull Burial Site, Fort Yates	Sioux	Cultural
United Tribes Annual Powwow, Bismarck	Burleigh	Cultural
Fort Abraham Lincoln State Park	Morton	Historical
North Dakota State Capitol, Bismarck	Burleigh	Historical
North Dakota Heritage Center, Bismarck	Burleigh	Historical/Cultural
Lawrence Welk's Birthplace, Strasburg	Emmons	Historical
Cross Ranch State Park	Oliver	Recreation
North Dakota Lewis and Clark Interpretive Center, Washburn	McLean	Historical
Native American Scenic Byway	Grant, Sioux	Historical/Cultural
Lake Sakakawea	MacLean, Ward, Montrail, Dunn, Williams, McKenzie, Mercer	Recreation

Recreational activities similar to those offered at Lake Oahe are also available at Lake Sharpe, which borders the southern end of Lake Oahe. Past surveys have indicated that the market areas of both projects overlap significantly. Lake Sakakawea, located roughly 75 miles from the northern end of Lake Oahe, also offers similar recreational activities.

REAL ESTATE

LAND ACQUISITION HISTORY

Under the authority of the Flood Control Act of 1944, the Corps acquired large acreages of land for the Oahe project. It was the general desire of the Administration at the time of acquisition that new project lands be restricted to the minimum operation and maintenance requirements and meet the readily foreseeable public access demand. The original acquisition criteria followed by the Corps were generally consistent with that policy.

The information used in determining the guide acquisition lines consisted of the estimated water elevations for each reach of the reservoir from the dam to 10.5 miles downstream from Bismarck, North Dakota. The proposed guide acquisition lines were ultimately based on (1) a maximum operating pool elevation of 1620 feet m.s.l. and (2) any area affected by backwater aggradation, bank caving, or erosion as a result of wind effects and wave actions as determined for the pool level at elevation 1617 feet m.s.l..

The actual acquisition line also included land required for construction, housing areas, rights-of-way for access, highways, and railroads.

The current Oahe project boundary was established by blocking out the guide acquisition lines, generally with a maximum of a 10-acre subdivision based on the United States public land survey system. The proposed acquisition was subject to subsequent changes to eliminate excessive severance damages and uneconomic remnants. In some remote areas of the project, flowage easements were acquired when certain other acquisition criteria were met.

Under the Fish and Wildlife Coordination Act (FWCA) of 1958, Federal water projects less than 60% complete by August of 1958 are required to acquire additional land to mitigate for habitat lost as a result of inundation. Lake Oahe is covered under the FWCA since it was 31% complete in August 1958. The FWCA also required a general plan, a collective plan signed by the Corps, U.S. Fish and Wildlife Service, and State wildlife agency identifying the strategies and acreages for wildlife purposes. All signatories agree that lands would be used for wildlife purposes or made available to another agency to be used for wildlife purposes. The general plan for Oahe project lands was signed in 1981.

In 1960s and 1970s, the USFWS and SDGFP coordinated with the Corps on potential ways to acquire additional land for the habitat mitigation required under FWCA, but public opposition stalled the process. In 1982, the Corps Omaha District prepared a post authorization mitigation report (M(Gen)15) for fish

and wildlife mitigation at Lakes Oahe and Sharpe. The plan proposed for $13.9 million worth of work to take place on existing project lands and to be funded out of operation and maintenance budgets, avoiding the need for land acquisitions or further congressional authorization. Although the USFWS and SDGFP endorsed a slightly modified version of this plan, M(Gen)19, as a good starting point, they did not endorse the plan as full mitigation. In the late 1980s and the 1990s the Corps implemented some wildlife mitigation at the Oahe project by contracting with the SDGFP to plant trees, food plots, and nesting cover on Corps land.

TITLE VI

Under the Title VI land transfer, mandated by the 1999 WRDA (P.L. 106-53) as amended by the 2000 WRDA (P.L. 106-541), the Corps is required to transfer in fee title certain lands and recreation areas (outside the boundaries of Indian reservations) above the top of the exclusive flood control pool, to the State of South Dakota to be managed by the SDGFP; transfer all lands including recreation areas within the boundaries of the CRST Indian Reservation above elevation 1620 feet m.s.l. to the DOI to be managed in trust for the tribe; and establish the South Dakota Terrestrial Wildlife Habitat Restoration Trust Fund and Cheyenne River Sioux Tribe Terrestrial Wildlife Habitat Restoration Trust Fund to pay for wildlife restoration work, cultural resources preservation, and management of transferred lands. The transfer of lands owned by the Corps in South Dakota to the State of South Dakota fulfills Corps obligations as defined in the 1982 post authorization plan, which was a plan for the restoration of terrestrial wildlife habitat loss that occurred as a result of flooding related to the Oahe project. Under the provisions of Title VI, the Corps retains fee title to lands and structures necessary for the operation of the Oahe dam and related flood control and hydropower structures, including land below elevation 1620 feet m.s.l..

On January 26, 2002, the Corps transferred in fee title 3,065.88 acres, including 27 recreation areas outside the boundaries of Indian reservations above elevation 1607.5 feet m.s.l. to the State of South Dakota. Fee title of other lands above elevation 1620 feet m.s.l., such as wildlife management lands totaling approximately 39,394 acres, were transferred to the State of South Dakota in July 2007. On June 5, 2002 the Department of Interior, Bureau of Indian Affairs accepted the transfer of custody and accountability of 32,879.64 acres, including 6 recreation areas within the boundaries of Cheyenne River Sioux Indian Reservation to be held in trust for the CRST. This completes the transfer of lands within the Cheyenne River Sioux Indian Reservation pursuant to Title VI prior to the Cheyenne River Sioux Tribe Terrestrial Wildlife Habitat Restoration Trust Fund being fully capitalized at $42,476,000.

After these trust funds are fully capitalized, interest from these funds can be used by the State of South Dakota and the CRST to develop, submit, and carry out plans for the restoration of terrestrial wildlife habitat loss that occurred as a result of flooding related to the projects carried out as part of the Pick-Sloan Missouri River Basin Program. The interest can also be used for protecting archeological, historical, and cultural sites, and for funding cost associated with lease, ownership, management, operation, administration, maintenance, or development of recreation areas and other land transferred or to be transferred by the Secretary of the Army.

CURRENT LANDHOLDINGS

There were four types of land tenure acquired for the Oahe project:

- Land owned by private parties in their own right or by State or local governments;
- Land that is held in trust by the United States for the benefit of Indian tribes (trust lands);
- Land that is held in trust by the United States individual Indian landowners (allotted trust lands); and
- Land owned by the United States in its own right or as public domain.

Generally, the Government acquired a fee simple Estate at Lake Oahe, subject only to certain existing easements or rights. Table 2-28 reflects the approximate acreages currently owned by the Government at the project. This section reflects lands transferred in fee title under Title VI (P.L. 105-53, WRDA 1999, as amended by P.L. 106-54, WRDA 2000) to the Department of the Interior/Cheyenne River Sioux Tribe and to the State of South Dakota in 2002. These transferred lands are not included in this Master Plan. These lands will be managed in perpetuity for the restoration of terrestrial wildlife habitat loss that occurred as a result of flooding related to the Oahe project and other reservoir projects carried out as part of the Pick-Sloan Missouri River Basin Program.

Table 2-28
Government-Owned Lands at the Oahe Project (in acres)

State	County	Acquired Land[1] in acres	Disposed Land[2] in acres	Adjust Acres	Current Acres
ND	Burleigh	11,077.830	434.400	0.000	10,643.430
ND	Emmons	32,638.330	0.000	0.000	32,638.330
ND	Morton	14,016.240	148.550	-0.510	13,867.180
ND	Sioux	26,349.870	38.470	0.000	26,310.400
SD	Campbell	23,310.620	4,574.892	0.000	18,735.728
SD	Corson	42,356.550	433.090	0.000	41,923.460
SD	Dewey	110,921.140	31,845.490	0.000	79,075.650
SD	Haakon	4,012.450	920.490	0.000	3,091.960
SD	Hughes	17,140.550	1,879.865	0.000	15,260.685
SD	Potter	18,848.500	4,049.563	0.000	14,798.937
SD	Stanley	58,354.430	15,605.667	0.000	42,748.760
SD	Sully	44,653.390	11,478.036	0.000	33,175.354
SD	Walworth	21,228.500	4,573.787	0.000	16,654.713
SD	Ziebach	4,859.040	1,106.460	0.000	3,752.580
Totals		429,767.440	77,089.760	-0.510	352,677.170

Source: 2010 REMIS

1. Acquired land includes fee land, easement, public domain, Tribal, and lands acquired for temporary use.
2. Disposed land includes fee land, easement, public domain, Tribal, and lands transferred under Title IV.

The United States bought or condemned land from non-Indians on both sides of the river. However, as the lands owned by the Cheyenne River Sioux and Standing Rock Sioux Tribes and their members were held in trust by the United States, such lands could only be transferred to the Corps by an act of Congress. Congress passed two laws to accomplish this purpose. P.L. 776 (68 Stat. 1191) approved 3 September 1954, acquired specific tracts of land from the Cheyenne River Sioux Tribe and individual members of the Tribe. P.L. 85-915 (72 Stat. 1762) approved 2 December 1958, acquired specific tracts of land from the Standing Rock Sioux Tribe and individual members of the Tribe. These public laws, however, reserved certain rights, title, interest, and privileges in the acquired land for the tribes and their members. Approximately 14,938 acres used for the project were public domain lands. These lands have been withdrawn, permanently set aside, and reserved for use in connection with the Oahe project.

EXECUTIVE ORDER SURVEYS

Executive Order 12512, dated 25 April 1985, and the Federal Property Management Regulations contained in 41 CFR 101-47 require periodic review of project landholdings to determine if Federal lands are being overused, underused, or are not being put to optimum use. To meet this requirement, the Omaha District conducts inspections of all projects, including the Oahe project.

ENCROACHMENTS

The majority of encroachments on project lands are found in agricultural/grazing leases and by adjacent landowners. Lessees and adjacent landowners sometimes expand their farming/ranching operations onto Corps-managed land without the appropriate authorization. Small portions of project lands are sometimes grazed or farmed. Occasionally, adjacent landowners will store machinery, construct corrals, or erect storage buildings on project land. These encroachments are usually minor in nature. Adjacent landowners/lessees sometimes find it difficult to readily define project boundaries in some areas. This occasionally results in unintentional encroachments.

BOUNDARY MONUMENTATION AND FENCING

Considerable emphasis has been placed on boundary monumentation on Oahe project lands. Extensive resources are expended on monumenting those areas currently managed for wildlife purposes, agricultural leasing, and intensive public use. Fencing has also been a priority in both wildlife and recreation areas. Encroachments and boundary line disputes are generally reduced after fencing project boundaries.

OUTGRANTS

An outgrant is any real estate instrument used to convey an interest or temporary use of project land. The types of outgrants done at Lake Oahe are leases, license, permits and easements. The COE has 230 outgrants issued on project lands with 175 in North Dakota and 55 in South Dakota. Pursuant to Title VI, the remaining outgrants were transferred and assigned to SDGFP for their continued management.

Leases. A lease is a contract between the owner (lessor or landlord) and the tenant (lessee) setting forth the term of occupancy and the conditions under which the tenant may occupy and use the property. A

lease conveys an interest in the property for a set time limit. The major leases at the Oahe Project include 17 public park and recreation leases, 124 agricultural leases (6 of which were assigned and/or transferred to the State of South Dakota pursuant to Title VI), and 2 commercial concession leases. One of the commercial concession leases was transferred and assigned and the remaining one was leased in perpetuity and assigned to the State of South Dakota pursuant to Title VI.

Licenses. A license grants authority to enter or use another's land or property without having ownership in it. It is revocable at will. Action without a license constitutes trespass. This type of outgrant includes Archeological Resources Protection Act permits issued pursuant to 32 CFR 229. There are 47 licenses issued at the project, 5 of which were transferred and/or assigned to the State of South Dakota pursuant to Title VI.

Permits. A permit is a revocable privilege granted to another Federal agency to use real property for a specific purpose without conferring possession. There are 22 permits issued to various Federal agencies for use of project lands, 3 of which were transferred to the Cheyenne River Sioux Tribe pursuant to Title VI

Easements. An easement allows one party to use certain lands of another party. An easement conveys an interest in the property. Rights-of-way are the most frequent easement requests for public land. There are 367 easements for rights-of-way for waterlines, roads, and gas lines throughout the project. The areas within the Cheyenne River Sioux Reservation boundaries transferred to the DOI and the recreation areas transferred to the State of South Dakota pursuant to Title VI were transferred subject to these easements.

FLOWAGE EASEMENTS

The flowage easements acquired at the Oahe project give the Government a perpetual right to overflow the land when necessary as a result of construction, maintenance, and operation of the project. The Government also has the right to enter the easement lands as needed as well as to remove from the easement lands any natural or manmade obstructions or structures which, in the opinion of the Government, may be detrimental to the operation and maintenance of the project. The flowage easements were acquired subject to "existing easements for public roads and highways, public utilities, railroads, and pipe lines."

Historically, it has been Corps policy to prohibit structures for human habitation on flowage easements acquired by the Corps. Construction and/or maintenance of non-habitable structures on the flowage easement are subject to prohibition or regulation by the District Engineer.

GRAZING RIGHTS WITHIN THE CRST AND SRST RESERVATIONS

Section 10 of Public Law 83-776 dated 3 September 1954 (68 Stat. 1191) and Section 10 of Public Law 85-915 dated 2 September 1958 (72 Stat. 1762.) provided that after the Oahe Dam gates were closed and the water of the Missouri River was impounded, the Cheyenne River Sioux and the Standing Rock Sioux Tribes, respectively, and their members were given exclusive permission, without cost, to graze livestock

on the land between the water level of the reservoir and the exterior boundary of the reservation. Consistent with this legislation and in accordance with the 26 May 1977, Decision by the Comptroller General, the Corps has deferred administration of all grazing programs within the reservation boundary to the Tribal Council and the Bureau of Indian Affairs.

These grazing rights have no effect on the statutory limitation that the grazing privileges only extend to lands the Secretary of the Army determines are not devoted to other beneficial uses or project purposes. Additionally, any land can be withdrawn from grazing if it is to be put to an authorized project use. Thus, public park and recreation or fish and wildlife uses continue to preempt the tribal grazing privileges.

A legal opinion was done in 1984 concerning these grazing rights. The opinion stated that these grazing rights have no effect on the statutory limitation that the grazing privileges only extend to lands the Secretary of the Army determines are not devoted to other beneficial uses or project purposes. Additionally, any land can be withdrawn from grazing if it is to be put to an authorized project use. Thus, public park and recreation or fish and wildlife uses continue to preempt the tribal grazing privileges.

PERTINENT PUBLIC LAWS

Civil Authority. Except as otherwise provided by Federal law or regulation, State and local laws and ordinances apply on Oahe project lands and waters. These include, but are not limited to, the following:

- Operation and use of motor vehicles, vessels, and aircraft;
- Hunting, fishing, and trapping;
- Display or use of firearms or other weapons;
- Camping, starting or tending fires and use of fireworks;
- Civil, disobedience, and criminal acts;
- Littering, sanitation, and pollution.

Enforcement of State and local laws and ordinances will be handled by the appropriate State and local law enforcement agencies.

Corps Authority. Rules and regulations governing public use of water resources development projects administered by the Corps are contained in Title 36, Part 327 of the Code of Federal Regulations. Persons designated by the District Engineer have the authority to issue citations for violations of rules and regulations governing public use of Corps water resource projects. If a citation is issued, the person charged with the violation may be required to appear before a U.S. Magistrate for trial.

Federal Authority. The following Federal public laws, Executive orders, and cooperative agreements pertain to authorization of the project, present and future development, and operation of

project lands and waters.

General Laws and Authorities

Public Law 534, 78th Congress (58 Stat. 887), 22 December 1944. Flood Control Act of 1944, as amended. *In compliance*. This act authorizes the construction of certain public works on rivers and harbors for flood control and other purposes. Section 4 authorizes providing facilities at reservoir areas for public use, including recreation and fish and wildlife conservation. As amended in 1962 by Section 297 of Public Law 87-874, the act authorizes the Corps to develop and maintain park and recreation facilities at all water resources projects controlled by the Secretary of the Army. The Oahe project is part of the multipurpose reservoir system on the Missouri River and provides for flood control, navigation, hydropower, recreation, and fish and wildlife conservation.

Public Law 776, 83rd Congress (68 Stat. 1191), 3 September 1954, Cheyenne River Reservation, South Dakota. *In compliance*. This law provides for the acquisition of specific tracts of land by the United States for the reservoir created by the construction of Oahe Dam on the Missouri River on the Cheyenne River Sioux Reservation, South Dakota, and for other purposes. Section 2 provides authorization to pay expenses, costs, losses, and damages to members of the tribe as a direct result of moving themselves and their possessions because of the construction of Lake Oahe. Section 3 directs the Secretary of the Army to relocate and reestablish such Indian cemeteries, tribal monuments, and shrines within the area taken under this act as the Cheyenne River Sioux Tribal Council shall select and designate, with the approval of the Secretary of the Interior. Section 10 gives the Indian Tribe and the members thereof exclusive permission, without cost, to graze stock on the land between the water level of the reservoir and the exterior boundary of the taking area.

Public Law 1928, 84th Congress (70A Stat. 150), 10 August 1956. United States Code, Title 10 and Title 32. *In compliance*. Section 2667 of this law authorizes the Secretary of a military department to lease non-excess land when it is advantageous to the United States. Grazing leases are also authorized under this provision. Sections 2668 and 2669 authorize the granting of easements and rights-of-way for many purposes, including transmission lines and gas, water, and sewer pipelines. At the Oahe Project, grazing leases are issued and easements and rights-of-way are granted for many purposes.

Public Law 85-915 (72 Stat. 1762), 2 December 1958, Standing Rock Sioux Reservation, North Dakota and South Dakota. *In compliance.* This law provides for the acquisition of approximately 55,993 acres of land by the United States required for the reservoir created by the construction of Oahe Dam on the Missouri River in North Dakota and South Dakota, and for other purposes. Section 2 provides authorization to pay expenses, costs, losses, and damages of members of the SRST as a direct result of moving themselves and their possessions because of the construction of the Oahe project. Section 3 directs the Secretary of the Army to relocate and reestablish such Indian cemeteries, tribal monuments, and shrines within the area taken under this act as a Standing Rock Tribal council shall select and designate, with the approval of the Secretary of the Interior. Section 10 gives the SRST and the members exclusive permission, without cost, to graze stock on the land between the water level of the reservoir and the exterior boundary of the taking area.

Public Law 88-578 (78 Stat. 897), 3 September 1964, Land and Water Conservation Fund Act (LWCFA) of 1965, as amended. *Not applicable*. Planning for recreation development at Corps projects is coordinated with the appropriate States so that the plans are consistent with public needs as identified in the SCORP. The Corps must coordinate with the NPS to insure that no property acquired or developed with assistance from this act will be converted to other than outdoor recreation uses. If conversion is necessary, approval of NPS is required, and plans are developed to relocate or re-create affected recreational opportunities. LWCA funds have been used at Graner Park for the addition of two metal picnic shelters.

Public Law 89-72 (79 Stat. 213), 9 July 1965, Federal Water Project Recreation Act, as amended. *Not applicable.* This Act requires that full consideration be given for recreation and fish and wildlife enhancement opportunities; that recreation planning be based on coordination of use with existing and planned Federal, State, and local recreation; and that non-Federal administration of recreation and enhancement areas be encouraged. It required that no facilities for recreation and fish and wildlife enhancement be provided without cost sharing except those justified to serve other project purposes or as needed for public health and safety. The views of the Secretary of the Interior regarding the extent to which proposed recreation and fish and wildlife development conforms to and is in accordance with the State Comprehensive Outdoor Recreation Plan shall be included in any project report.

NOTE: This public law did not apply to the Oahe project because the project was authorized prior to enactment of Public Law 89-72 and did not provide for retroactive application. As a matter of policy, the Chief of Engineers determined that the cost-sharing provisions of Public Law 89-72 would apply to the Oahe project and other similar projects even though they were not covered specifically by the law.

Public Law 90-483 (82 Stat. 731), 13 August 1968, River and Harbor Act of 1968, as amended. *In compliance*. This Act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and other purposes. Section 210 restricts the collection of entrance fees at Corps lakes and reservoirs after 31 March 1970 to users of highly developed facilities requiring the continuous presence of personnel. Because the Corps will be conducting any projects under the updated master plan, no authorization is required as the law specifically exempts the Corps from regulation under Section 10. However, activities by non-Corps entities in waters of the U.S. at the Oahe project are regulated under Section 10. Work such as a boat dock installation or water intake line requires a Section 10 permit application; for work that includes placing fill, a joint Section 404/10 permit application can be made.

Executive Order 11644, 8 February 1972, Use of Off-Road Vehicles on Public Lands. *In compliance*. This Executive order establishes a uniform Federal policy regarding the use of vehicles such as trail bikes, snowmobiles, dune buggies, and other ORV on public lands. Section 3 provides guidance for establishing zones of use for such vehicles. This order was amended by Executive Order 11989. Currently the Corps restricts ORV use on project lands.

Public Law 99-662 (100 Stat. 4082), 17 November 1986, Water Resources Development Act of 1986. *In compliance*. This legislation sets forth non-Federal cost-sharing requirements for all water resources projects. Section 906 of this act supplements the responsibility and authority of the Secretary of the Army pursuant to the Fish and Wildlife Coordination Act. This section requires any mitigation for fish and wildlife losses to be undertaken or acquired before any construction of the project commences, or shall be undertaken or acquired concurrently with lands and interests in lands for project purposes. The Corps will coordinate with the USFWS when constructing any projects under the master plan and will address any fish and wildlife mitigation that is required before the construction of any project commences.

Public Law 102-575 (106 Stat. 4731), 30 October 1992, Title XXXV - Three Affiliated Tribes and Standing Rock Sioux Tribe Equitable Compensation Act. *In compliance*. Section 3503 declares that the Standing Rock Sioux Tribe is entitled to additional financial compensation for the taking of over 56,000 acres of its reservation lands, as the site for the Oahe Reservoir. The act also provided that certain lands acquired by the Government in areas surrounding the reservoir created by Oahe Dam would be offered for sale to the owners from whom they had been purchased or to their heirs. All land not acquired by the original owners or heirs would be available for purchase by the Standing Rock Sioux Tribe. The land transfer part of this act was repealed by Congress in February 1994.

Public Law 103-211 (108 Stat 3,41) 12 February 1994, Emergency Supplemental Appropriation Act. *In compliance.* Section 407 of this act repealed the land transfer provisions of the Public Law 102-575 as they pertained to the Oahe project (Section 3509).

Public Law 106-53, 17 August 1999, Title VI of the Water Resources Development Act of 1999. Cheyenne River Sioux Tribe, Lower Brule Sioux Tribe, and State of South Dakota Terrestrial Wildlife Habitat Restoration. *In compliance*. Under this provision, the Government retains fee title to lands and structures necessary for the continuation of the operation, maintenance, repair, replacement, rehabilitation, and structural integrity of the dam and related flood control and hydropower structures, including land below the top of the exclusive flood control pool, and can lease in perpetuity all or part of certain recreation areas associated with the dams to the State of South Dakota or to the Cheyenne River Sioux Tribe at the Oahe project. Title VI establishes the South Dakota and Cheyenne River Sioux Tribe Terrestrial Wildlife Habitat Restoration Trust Fund. After these funds are fully capitalized the interest may be used for costs associated with the restoration and management costs associated with the transferred lands. This legislation also requires the Secretary to arrange for the U.S. Geological Survey to complete a comprehensive study of the potential impacts on water flows in the Missouri River as a result of the transfer of lands under this title and prohibits such transfers until the secretary determines that the transfers will not significantly reduce the amount of water flow to the downstream States of the Missouri River. The master plan reflects land transfers that have occurred as a result of Title VI.

Public Law 106-541, 11 December 2000, Title VI of the Water Resources Development Act of 2000. *In compliance.* Section 540 of this act amended Public Law 106-53. The section applied a deadline of 1

January 2002 for land transfers; included direction on the lease of specific recreation areas to the State of South Dakota; and a requirement to clean up each open dump and hazardous waste site. The act also established both a Cultural Resources Advisory Commission as well as a requirement to inventory and stabilize each cultural and historic site on land to be transferred. The master plan reflects land transfers that have occurred as a result of Title VI.

Environmental Quality Statutes

40 Stat. 755, 13 July 1918, Migratory Bird Treaty Act (MBTA), as amended. *In compliance.* The MBTA of 1918 is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent overutilization. Executive Order 13186 (2001) directs executive agencies to take certain actions to implement the act. When development proposed in the master plan is scheduled to occur, compliance with the MBTA will be considered along with environmental compliance for the specific activities.

54 Stat. 250, 8 June 1940, Bald Eagle Protection Act of 1940, as amended. *In compliance*. This act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles, including their parts, nests, or eggs. The act provides criminal penalties for persons who take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The act defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Individual projects proposed as a result of the master plan will adhere to the management guidelines developed by the USFWS to avoid disturbing bald eagles.

Public Law 83-566 (68 Stat. 666), 5 August 1954, Watershed Protection and Flood Prevention Act. *Not applicable*. This act authorizes the Secretary of Agriculture to cooperate with States and other public agencies in works for flood prevention and soil conservation, as well as the conservation, development, utilization, and disposal of water. This act imposes no requirements on Corps Civil Works projects.

Public Law 85-624 (72 Stat. 563), 12 August 1958, Fish and Wildlife Coordination Act. *In compliance*. This law amends and renames the Fish and Wildlife Coordination Act of 10 March 1934. The 1958 act requires that: (1)fish and wildlife conservation receive equal consideration with other features of water resources development programs; (2) proposals for work affecting any body of water be coordinated with the USFWS and State wildlife agency; (3) recommendations of the USFWS and State wildlife agency be given full consideration; and (4) justifiable means and measures for wildlife purposes, including mitigation measures, be adopted. It also required that adequate provisions be made for the use of project lands and waters for the conservation, maintenance, and management of wildlife resources, including their development and improvement. The act provides that the use of project lands primarily for wildlife

management by others be in accordance with a General Plan approved jointly by the Department of the Army, Department of the Interior, and State wildlife agencies. When site-specific proposals are made under the master plan, the Corps will coordinate with the USFWS and NDGF or SDGFP.

Public Law 86-717 (74 Stat. 817), 6 September 1960, Conservation of Forest Lands in Reservoir Areas. *In compliance*. This law provides for the development and maintenance of forest resources on Corps managed lands and the establishment and management of vegetative cover so as to encourage future resources of readily available timber and to increase the value of such areas for conservation. Resource objectives and development needs for the management units include planting trees and shrubs to increase the amount of woody vegetation for winter and nesting cover for upland and big game species; planting trees, food plots, native grasses, and/or marsh grasses to supplement the existing food sources for upland and big game species and/or waterfowl; and developing additional woody draw habitat

Public Law 87-88 (75 Stat. 204), 20 July 1961, Federal Water Pollution Control Act Amendments of 1961, as amended. *In compliance*. Section 2 (b) (1) of this act gives the Corps responsibility for water quality management of Corps reservoirs. This law was amended by the Federal Water Pollution Control Act Amendment of 1972, Public Law 92-500.

Public Law 89-80 (79 Stat. 244), 20 July 1965, Water Resources Planning Act. *In compliance*. This act is a congressional statement of policy to meet rapidly expanding demands for water throughout the Nation. The purpose is to encourage the conservation, development, and use of water-related land resources on a comprehensive and coordinated basis by the Federal, State, and local governments; individuals; corporations; business enterprises; and others concerned. The Corps held public workshops attended by Federal, State, and local representatives and members of the general public (including members of the business community) and invited public input on the master plan and EA.

Public Law 90-542 (82 Stat. 906), 2 October 1968, Wild and Scenic Rivers Act, as amended. *Not applicable*. This act establishes that certain rivers of the Nation, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The reach of the Missouri River where the Oahe project is located is not designated as a wild or scenic river, nor is it on the National Inventory of Rivers potentially eligible for inclusion.

Public Law 90-583 (82 Stat. 1146), 17 October 1968, Noxious Plant Control. *In compliance*. This law provides for a control of noxious weeds on land under the control of the Federal Government. Resource objectives and development needs for management units include the control of noxious weeds.

Public Law 91-190 (83 Stat. 852), 1 January 1970, National Environmental Policy Act of 1969. *In compliance*. Section 101 of this act establishes a national environmental policy. Section 102 requires that all Federal agencies shall, to the fullest extent possible, (1) use a systematic, interdisciplinary approach

that integrates natural and social sciences and environmental design arts in planning and decision making; (2) study, develop, and describe appropriate alternatives to recommend courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources; and (3) include an Environmental Impact Statement (EIS) in every recommendation or report on proposals for major Federal actions significantly affecting the quality of the human environment. An EA and finding of no significant impact (FONSI) have been prepared for the proposed action. An EIS is not required.

Public Law 91-224 (84 Stat. 114), 3 April 1970, Environmental Quality Improvement Act of 1970. *In compliance*. This act assures that each Federal department or agency conducting or supporting public works activities which affect the environment shall implement the policies established under existing law. The Corps ensures that activities at the Oahe project are in compliance with existing laws.

Public Law 91-604 (84 Stat. 1676), 31 December 1970, Clean Air Act, as amended. *In compliance*. The purpose of this act is to protect public health and welfare by the control of air pollution at its source, and to set forth primary and secondary National Ambient Air Quality Standards (NAAQS) to establish criteria for States to attain, or maintain. Some temporary emission releases may occur during construction activities that are recommended under the master plan; however, air quality is not expected to be impacted to any measurable degree. Data from the NDDH and SDDENR ambient air quality monitoring program indicate that pollutant concentrations are well within the Federal and State NAAQS set at levels to protect human health and welfare.

Public Law 92-500 (86 Stat. 816), 18 October 1972, The Federal Water Pollution Control Act Amendments of 1972, as amended. *In compliance*. This law amends the Federal Water Pollution Control Act and establishes a national goal of eliminating pollutant discharges into waters of the United States. Section 404 authorizes a permit program for the disposal of dredged or fill material in the Nation's waters that is to be administered by the Secretary of the Army acting through the Chief of Engineers. This law was later amended by the Clean Water Act of 1977, Public Law 95-217, to provide additional authorization to restore the Nation's water. The project is in compliance with this law. If any construction activities involve the temporary or permanent placement of dredged or fill material into any waterbody or wetland area at Lake Oahe, a permit pursuant to Section 404 is required.

Public Law 92-574 (86 Stat. 1234), 27 October 1972, Noise Control Act, as amended. *In compliance*. This act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. Federal agencies are required to limit noise emissions to within compliance levels. Noise emission levels at sites where development was proposed in the updated Oahe Master Plan would increase above current levels temporarily during periods of construction; however, appropriate measures will be taken to keep the noise level within the compliance levels.

Public Law 93-205 (87 Stat. 884), 28 December 1973, Conservation, Protection, and Propagation of Endangered Species Act of 1973, as amended. *In compliance*. This law repeals the Endangered Species Conservation Act of 1969. It also directs all Federal departments/agencies to carry out programs to

conserve endangered and threatened species of fish, wildlife, and plants and to preserve the habitat of these species in consultation with the Secretary of the Interior. This act establishes a procedure for coordination, assessment, and consultation. This act was amended by Public Law 96-159. Corps management and construction activities proposed by the master plan would have no effects on federally or State listed or candidate threatened and endangered species known to exist in Oahe project areas for which the Corps is responsible.

Public Law 93-523 (88 Stat. 1660), 16 December 1974, Safe Drinking Water Act, as amended. *In compliance*. This act amends the Public Health Service Water Act to assure that the public is provided with safe drinking water. This law states that all potable water at civil works projects will meet or exceed the minimum standards required by law. This act was amended by the Safe Drinking Water Act Amendments of 1986, Public Law 99-339 of 1986, and Public Law 104-182. The NDDH and SDDENR work with all public water systems along Lake Oahe to ensure they comply with this act.

Public Law 93-629, (88 Stat. 2148), 3 January 1975, Federal Noxious Weed Act of 1974, as amended. *In compliance*. Section 15, added to the act in 1990, requires noxious weed control management on Federal lands and sets forth the process by which it is to be accomplished. Resource objectives and development needs for management units in the master plan include the control of noxious weeds.

Executive Order 11988, 24 May 1977, Floodplain Management. *In compliance*. This order outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency shall evaluate the potential effects of actions on floodplains and should not undertake actions that directly or indirectly induce growth in the floodplain, unless there is no practical alternative. Agency regulations and operating procedures for licenses and permits should include provisions for evaluation and consideration of flood hazards. Construction of structures and facilities on floodplains must incorporate flood proofing and other accepted flood protection measures. Agencies shall attach appropriate use restrictions to property proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties.

Any development proposed in the master plan must be in compliance with Northwestern Division (NWD) Regulation 1110-2-5, Land Development Guidance at Corps Reservoir Projects, dated April 30, 2004. This regulation establishes NWD guidance for evaluating land development proposals within Corps reservoir projects with authorized flood storage allocations. The Corps has responsibility to assure that the authorized project purposes are not compromised, that the public is not endangered, and that natural and cultural resources associated with project lands are not harmed, in accordance with applicable Federal and State regulations. The criteria and procedures for evaluation of development proposals in this regulation are to assist in meeting these responsibilities and complying with applicable laws and directives. Existing structures are exempted from this policy. However, significant modifications and/or replacement of existing structures are subject to this policy.

Executive Order 11989, 24 May 1977, Off-Road Vehicles on Public Lands. *In compliance*. This Executive order excludes any fire, military, emergency or law enforcement vehicle when used for

emergency purposes, and any combat or combat support vehicle when used for national defense purposes, from the definition of ORV. This order also directs agencies to immediately close ORV trails that are causing soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources of particular areas or trails on public lands, to the type of ORV causing the adverse effects, until the effects have been eliminated and measures have been implemented to prevent future recurrence. Currently the Corps restricts ORV use on project lands.

Executive Order 11990, 24 May 1977, Protection of Wetlands. *In compliance*. This order directs Federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands. Section 2 states that agencies shall avoid undertaking or assisting in new construction located in wetlands unless there is no practical alternative. Prior to construction of any facilities proposed in the Oahe Dam/Lake Oahe Master Plan, a site-specific NEPA analysis, including an assessment of potential impacts to wetlands, would be coordinated with Federal and State agencies and Tribes. If a Section 404 permit is required, coordination regarding compliance with E.O. 11990 would be accomplished prior to permit issuance.

Public Law 95-217 (91 Stat. 1566), 27 December 1977, Clean Water Act of 1977, as amended. *In compliance*. This act amends the Federal Water Pollution Control Act of 1970 and extends the appropriations authorization. The Clean Water Act is a comprehensive Federal water pollution control program that has as its primary goal the reduction and control of the discharge of pollutants into the Nation's navigable waters. The Clean Water Act of 1977 has been amended by the Water Quality Act of 1987, Public Law 100-4. Any action involving placement of fill in waters of the U.S. at the Oahe project by the Corps, a non-Corps entity, or any individual, with the exception of certain minor activities as discussed in 33 CFR Part 323.4, would require a Section 404 authorization and Section 401 water quality certification.

Executive Order 12088, 13 October 1978, Federal Compliance with Pollution Control Standards. *In compliance*. The purpose of this order is to ensure Federal compliance with applicable pollution control standards. Section 1-4, Pollution Control Plan, in which each agency was required to submit an annual plan for the control of environmental pollution to the Office of Management and Budget, was revoked by Executive Order 13148, which was revoked by Executive Order 13423.

Public Law 95-632 (92 Stat. 3751), 10 November 1978, Endangered Species Act Amendments of 1978. *In compliance*. This law amends the Endangered Species Act Amendments of 1973. Section 7 directs agencies to conduct a biological assessment to identify threatened or endangered species that may be present in the area of any proposed project. This assessment is conducted as part of a Federal agency's compliance with the requirements of Section 102 of the National Environmental Policy Act (NEPA) of 1969. The Corps would conduct biological assessments on proposed projects when necessary.

Public Law 96-159 (93 Stat. 3751), 28 December 1979, Endangered Species Act of 1973, as amended. *In compliance*. This amendment expanded the act to protect endangered plants. This amendment requires

the publishing of a summary and map when proposing land as critical habitat and requires Federal agencies to ensure projects "are not likely" to jeopardize an endangered species. In addition, it authorizes all those seeking exemptions from the act to get permanent exemptions for a project unless a biological study indicates the project would result in the extinction of a species. The Corps would ensure that any development or management activities proposed in the master plan are not likely to jeopardize an endangered species. Although there are currently no threatened or endangered plants at the Oahe project, the Corps would protect any plants on project lands that are on the threatened and endangered species list in the future.

CEQ Memorandum, 10 August 1980, Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory. *Not applicable*. This memorandum states that each Federal agency shall take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory (45 FR 59189). No portion of the Oahe project is listed on the Nationwide Rivers Inventory.

Public Law 96-366 (94 Stat. 1322), 29 September 1980, Fish and Wildlife Conservation Act of 1980. *In compliance*. This law enables States to obtain funds to conduct inventories and conservation plans for nongame wildlife. It also encourages Federal departments and agencies to use their statutory and administrative authority to conserve and promote conservation in accordance with this act. The master plan promotes conservation at the Oahe project by including resource objectives and development needs that protect and enhanced wildlife habitat and reduce erosion.

Public Law 96-510 (94 Stat. 2797), 11 December 1980, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). *Not applicable*. Typically CERCLA is triggered by (1) the release or substantial threat of a release of a hazardous substance into the environment; or (2) the release or substantial threat of a release of any pollutant or contaminant into the environment that presents an imminent threat to the public health and welfare. To the extent such knowledge is available, 40 CFR Part 373 requires notification of CERCLA hazardous substances in a land transfer. Compliance with this act is required on a case-by-case basis for real estate activities such as easements, grants, etc.

Public Law 97-98 (95 Stat. 1341), 22 December 1981, Farmland Protection Policy Act. *In compliance*. This act instructs the Department of Agriculture, in cooperation with other departments, agencies, independent commissions and other units of the Federal Government, to develop criteria for identifying the effects of Federal programs on the conversion of farmland to nonagricultural uses. The master plan does not propose any changes to agricultural land.

Public Law 99-339 (100 Stat. 642), 19 June 1986, Safe Drinking Water Act Amendments of 1986. *In compliance*. These amendments provide further regulation regarding national primary drinking water, enforcement of these regulations, and variances and exemptions to the act. These amendments also provide for the protection of underground sources of drinking water and provide grants to Tribes in addition to contract assistance to carry out the function of these amendments. The NDDH and SDDENR enforce the amendments at public works systems throughout the State, including those along Lake Oahe.

Public Law 100-4 (101 Stat. 7), 4 February 1987, Water Quality Act of 1987. *In compliance*. This Act amends the Federal Water Pollution Control Act to not only provide for renewal of the quality of the Nation's waters but also provide construction grant amendments, standards, enforcement, permits, and licenses. This act includes more provisions for monitoring non-point source pollution (contaminants that come from many different sources). The Corps has developed water quality management objectives for the Oahe project that include intensive water quality surveys, water quality modeling, and preparation of reports that reflect current water quality conditions

Public Law 101-233 (103 Stat. 1968), 13 December 1989, North American Wetlands Conservation Act. *In compliance*. This act establishes the North American Wetlands Conservation Council (NAWCC, 16 U.S.C. 4403) to recommend wetlands conservation projects to the Migratory Bird Conservation Commission (MBCC). Section 9 of the act addresses the restoration, management, and protection of wetlands and habitat for migratory birds on Federal lands. Federal agencies acquiring, managing, or disposing of Federal lands and waters are to cooperate with the USFWS to restore, protect, and enhance wetland ecosystems and other habitats for migratory birds, fish and wildlife on their lands, to the extent consistent with their missions and statutory authorities. The master plan proposes restoration of new wetlands at a few management units. Prior to construction of any facilities proposed in the master plan, a site-specific NEPA analysis, including an assessment of potential impacts to wetlands, would be coordinated with Federal and State agencies and tribes

Executive Order 12692, 7 June 1995, Recreational Fisheries. *In compliance*. This Executive order mandates that Federal agencies, to the extent permitted by law and where practicable, improve the quality, function, and sustainable productivity and distribution of U.S. aquatic resources for increased recreational fishing opportunities. The Corps will continue to cooperate with NDGF and SDGFP to manage fisheries at Lake Oahe. Many management units include a resource objective to provide and maintain access to Lake Oahe for fishing.

Public Law 104-182 (110 Stat. 1613), 6 August 1996, Safe Drinking Water Act Amendments of 1996. *In compliance*. These amendments strengthen protections on tap water, improve public access to tap water contaminant information, strengthen standards to protect public health from the most significant threats to safe drinking water, and provide money that communities need to upgrade drinking water systems. The NDDH and SDDENR enforce the amendments at public works systems throughout the State, including those along Lake Oahe.

Executive Order 13112, 3 February 1999, Invasive Species. *In compliance*. This Executive order directs Federal agencies to act to prevent the introduction of or to monitor and control invasive (non-native) species, to provide for restoration of native species, to conduct research, to promote educational activities, and to exercise care in taking actions that could promote the introduction or spread of invasive species. Resource objectives and development needs for management units include the control of noxious weeds.

Executive Order 13148, 26 April 2000, Greening the Government Through Leadership in Environmental Management. *In compliance*. This Executive order requires Federal agencies to develop and implement an Environmental Management System (EMS), which is a series of management processes and procedures that allow an organization to identify, mitigate, control, and reduce any environmental impacts from the organization's day-to-day business activities. Specifically, this order requires each agency to develop an environmental policy statement; develop a plan for system implementation; complete a list of environmental aspects and impacts; establish objectives, targets, and programs; conduct EMS awareness training; complete a management review of the EMS; and implement the EMS before 31 December 2005. This order was revoked by Executive Order 13423.

Executive Order 13195, 18 January 2001, Trails for America in the 21st Century. *In compliance*. This Executive order requires Federal agencies to protect, connect, promote, and assists trails of all types throughout the United States. Several trails are proposed as part of the master plan. Development needs at General Sibley Park include constructing a hiking/biking trail leading through the recreation area then north into Bismarck and expanding and improving the two nature trails within the park. Fort Rice Recreation Area and Fort Yates Recreation Area include the development of hiking/biking trails as development needs. Indian Memorial Recreation Area includes the development of a series of nature trails using the existing unpaved roads south of the main campground as a development need.

Executive Order 13352, 26 August 2004, Facilitation of Cooperative Conservation. *In compliance*. This Executive order requires that the Secretaries of the Interior, Agriculture, Commerce, and Defense and the Administrator of the EPA shall carry out the programs, projects, and activities of the agency that they respectively head that implement laws relating to the environment and natural resources in a manner that: a) facilitates cooperative conservation; b) takes appropriate account of and respects the interests of persons with ownership or other legally recognized interests in land and other natural resources; c) properly accommodates local participation in Federal decision making; and d) provides that the programs, projects, and activities are consistent with protecting public health and safety. The Oahe project office coordinates with Federal, State and local agencies and non-governmental organizations to develop, manage, and monitor resources at the Oahe project.

Public Law 109-320 (120 Stat. 1748), 11 October 2006, Salt Cedar and Russian Olive Control Demonstration Act. *In compliance*. Requires the Secretary of the Interior to work with Secretary of Agriculture and Secretary of Defense to carry out a saltcedar and Russian olive assessment program to assess the extent of saltcedar and Russian olive in the western United States, demonstrate strategic solutions for long-term management of saltcedar and Russian olive and assess economic means to dispose of salt cedar and Russian olive. The Corps coordinates with the multi-State and multi-agency saltcedar task force to control saltcedar at Lake Oahe.

Executive Order 13423, 24 January 2007, Strengthening Federal Environmental, Energy, and Transportation Management. *In compliance*. This Executive order requires Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their

respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. The order sets goals in the areas of energy efficiency, acquisition, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, fleets, and water conservation. In addition, the order requires more widespread use of Environmental Management Systems (EMS) as the framework in which to manage and continually improve these sustainable practices. It is supplemented by implementing instructions, issued 29 March 2007, by the CEQ. The Oahe project has developed and implemented an EMS Plan.

Executive Order 13443, 17 Aug 2007, Facilitation of Hunting Heritage and Wildlife Conservation. *In compliance*. The purpose of this order is to direct Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

Resource objectives and development needs for many management units at Oahe include providing and maintaining lake access for hunting and providing opportunities for hunting.

Cultural Resource Statutes

Public Law 59-209, 59th Congress (34 Stat. 225), 8 June 1906, The Antiquities Act. *In compliance*. This act makes it a Federal offense to appropriate, excavate, injure, or destroy any antiquity, historic ruin, monument, or object of scientific interest located on lands owned or controlled by the United States without having permission from the Secretary of the department having jurisdiction thereof. Paleontological resources are regulated under this act. The Corps is working to coordinate with all law enforcement agencies to establish a network of individuals that would be able to respond quickly to incidents of looting and artifact collecting.

Public Law 86-523 (74 Stat. 220), 27 June 1960, Reservoir Salvage Act, as amended. *In compliance*. This act provides for (1) the preservation of historical and archaeological data that might otherwise be lost or destroyed as the result of flooding or any alteration of the terrain caused as a result of any Federal reservoir construction projects; (2) coordination with the Secretary of the Interior whenever activities may cause loss of scientific, prehistorical, or archaeological data; and (3) expenditure of funds for recovery, protection, and data preservation. This act was amended by Public Law 93-291. Any construction proposed at the Oahe project connected to operation and maintenance of the facility is reviewed in advance by the Corps' Omaha District cultural resources staff. In all cases avoidance of historic properties is the preferred alternative. When such disturbance is unavoidable, suitable protection or data recovery will be implemented as required by the act

Public Law 89-665 (80 Stat. 915), 15 October 1966, Historic Preservation Act, as amended. *In compliance*. This act states a policy of preserving, restoring, and maintaining cultural resources and requires that Federal agencies (1) take into account the effect of any undertaking on any site on or eligible for the NRHP; (2) afford the Advisory Council on Historic Preservation the opportunity to comment on

such undertaking; (3) nominate eligible properties to the NRHP; (4) exercise caution in the disposal and care of Federal property that might qualify for the NRHP; and (5) provide for the maintenance of federally owned sites on the NRHP. All ground-disturbing activities proposed on Oahe project lands are coordinated in advance with the State Historic Preservation Officer (SHPO), ACHP, THPO, and any other interested parties under Section 106 of the act.

Executive Order 11593, 13 May 1971, Protection and Enhancement of the Cultural Environment. *In compliance*. Section 2 of the order outlines the responsibilities of Federal agencies in accordance with the National Environmental Policy Act of 1969, the National Historic Preservation Act of 1966, the Historic Sites Act of 1935, and the Antiquities Act of 1906. Section 3 outlines specific responsibilities of the Secretary of the Interior including review and comment upon Federal agency procedures submitted under this order. The Oahe Cultural Resources Management Plan describes Corps procedures for inventorying, managing, and protecting cultural resources at the Oahe project.

Public Law 93-291 (88 Stat. 174), 24 May 1974 Preservation of Historical and Archeological Data. *In compliance*. This act amends the Reservoir Salvage Act, Public Law 86-523, to provide for the preservation of historical and archaeological data (including relics and specimens), which might otherwise be lost as the result of the construction of a dam. Section 3(a) requires any Federal agency to notify the Secretary of the Interior in writing when the agency finds, or is notified in writing by an appropriate historical or archaeological authority, that its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical or archeological data. Section 7(a) requires any Federal agency responsible for a construction project to assist/transfer to the Secretary of the Interior such funds as may be agreed upon, but not more than 1 percent of the total appropriated project costs. The costs of survey, recovery, analysis, and publication shall be considered non-reimbursable project costs. The Corps will notify the Secretary of the Interior in writing if a Corps activity may destroy significant scientific, prehistoric, or archeological data.

Public Law 95-341 (92 Stat. 469), 11 August 1978, American Indian Religious Freedom Act (AIRFA) of 1978. *In compliance*. AIRFA protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. No proposals in the updated Master Plan would adversely affect the protections offered by this act. Access to sacred sites by tribal members would be provided. A memorandum from the Corps' Northwestern Division dated June 7, 2004, Subject: Use of Corps Lands by Federally Recognized Tribal Members in the Northwestern Division provides guidance for access to Corps-owned lands for Tribal religious activities, including notification protocol and procedures.

Public Law 96-95 (93 Stat. 721), 31 October 1979, Archaeological Resources Protection Act (ARPA) of 1979. *In compliance*. This act protects archaeological resources and sites that are on public and Tribal lands, and fosters increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals. It also establishes requirements for

issuance of permits by the Federal land managers to excavate or remove any archaeological resource located on public or Indian lands. All persons proposing to engage in archeological excavation on Oahe project lands are required to apply for and obtain an ARPA permit.

Public Law 101-601 (104 Stat. 3042), 16 November 1990, Native American Graves Protection and Repatriation Act (NAGPRA). *In compliance*. This act provides for the protection of Native American and Native Hawaiian cultural items. It establishes a process for the authorized removal of human remains, funerary, sacred, and other objects of cultural patrimony from sites located on land owned or controlled by the Federal Government. NAGPRA requires Federal agencies and federally assisted museums to return specified Native American cultural items to the federally recognized Indian tribes or Native Hawaiian groups with which they are associated. Notification of all inadvertent discoveries of such items covered by the act is reported to the appropriate affiliated descendant or Tribe in order of precedence as set by the act. Any claims to such items are reviewed and the procedures to repatriate within the act are followed.

Executive Order 12898, 11 February 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. *In compliance*. Federal agencies shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. Development and management activities proposed in the master plan are not anticipated to disproportionately impact minority or low-income populations.

Executive Order 13006, 21 May 1996, Locating Federal Facilities on Historic Properites. *In compliance*. This Executive order requires Federal facilities, wherever operationally appropriate and economically prudent, to be located in historic properties and districts, especially those located in our central business areas. No activities under the master plan involve the development of Federal facilities that could be located in historic properties.

Executive Order 13007, 24 May 1996, Indian Sacred Sites. *In compliance*. This Executive order requires that agencies avoid damage to Indian sacred sites on Federal land, and avoid blocking access to such sites for traditional religious practitioners. The Federal Government gives Tribes notice when an impact to a sacred site occurs. In 2004, the Commander of the Northwestern Division issued a memorandum stating that the Corps should accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners. In addition, the Corps would issue special use permits without charge, whenever allowable on Corps lands, to tribes and tribal members for ceremonial purposes. The memorandum also provides procedures that assist land managers with site protection as well as monitoring and investigation of any illegal activity regarding cultural resources.

Executive Order 13175, 6 November 2000, Consultation and Coordination with Indian Tribal Governments. *In compliance*. This Executive order requires regular and meaningful consultation and

collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes. Section 3 establishes policymaking criteria when formulating and implementing policies that have tribal implications. Section 5 (a) says each agency shall have an accountable process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications. Tribal representatives were consulted with as part of the Oahe Master Plan and EA scoping and were provided copies of the Draft Master Plan and Draft EA for review.

Executive Order 13287, 3 March 2003, Preserve America. *In compliance*. This Executive order encourages Federal agencies to recognize and manage the historic properties in their ownership as assets that can support department and agency missions while contributing to the vitality and economic well-being of the Nation's communities. This Executive order also encourages Federal agencies to seek partnerships with State, tribal, and local governments and the private sector to make more efficient and informed use of their historic, prehistoric, and other cultural resources for economic development and other recognized public benefits. The Corps has partnered with State, tribal, and local governments and the private sector by forming a steering committee that has provided input on the master plan's effects on cultural resources, including historic properties, and other public benefits.

COOPERATIVE AGREEMENTS

Cooperative Agreement, 1989. This cooperative agreement is between the Department of the Interior and the Department of the Army regarding waterfowl habitat conservation opportunities associated with Corps civil works projects and activities consistent with the North American Waterfowl Management Plan (NAWMP). In May 1986, the United States and Canada signed the NAWMP. The goal of this plan is to restore the Nation's waterfowl population to the same numbers as in the early 1970s.

Memorandum of Agreement (MOA) with the North Dakota Geological Survey (NDGS), 1991. This agreement gives qualified personnel from the North Dakota Geological Survey permission to access District lands for the purpose of locating, identifying, collecting, and curating paleontological specimens. The MOA further specifies that these paleontological specimens be curated by the NDGS at the Heritage Center in Bismarck, North Dakota, and labeled "Property of the Omaha District, Corps of Engineers."

NAGPRA-based Memorandum of Agreement, 1993. This agreement between the Corps' Omaha District and the North Dakota Intertribal Reinterment Committee covers the procedures for the care and proper treatment of Native American human remains on Corps-owned project lands at Bowman-Haley, Oahe, Sakakawea, and Pipestem projects in North Dakota.

Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act, as amended, 2004. In September 2001, the Corps made the decision to replace the existing Programmatic Agreement (PA) for implementation of Section 106 of the NHPA, which was signed in 1993. The existing PA was an agreement between the

Corps, the Nebraska, South Dakota, North Dakota and Montana State SHPOs, and the ACHP. Since the signing of the agreement, a requirement came into effect in which the Corps was to involve the Native American Tribes within the Missouri River Basin in the implementation of the Cultural Resources Program in the Omaha District, which is the upper Missouri River Basin. The District and the consulting parties signed this agreement on April 13, 2004. The final PA included twenty-nine signatories, including representatives from three Federal agencies, sixteen Tribal governments, one State agency, and one private organization, as well as two Tribal Historic Preservation Officers (THPOs) and four SHPOs.

MANAGEMENT PLANS

PROJECT/DISTRICT MANAGEMENT PLANS

There are several management plans that provide the direction of activities and expenditures for the Oahe Dam/Lake Oahe project. The plans, discussed below, are interrelated and each must be considered when planning for the future.

Operational Management Plan (OMP). The OMP is a management action document that describes in detail how resource objectives and concepts prescribed in the master plan will be implemented and achieved. As of this writing, the latest OMP for Lake Oahe was approved in August 1989. An update of the plan is scheduled for the near future.

Shoreline Management Plan. A Shoreline Management Plan is prepared as part of the OMP. It is the policy of the Chief of Engineers to protect and manage shorelines of all Civil Works water resource development projects under Corps jurisdiction in a manner that will promote the safe and healthful use of these shorelines by the public while maintaining environmental safeguards to ensure a quality resource for use by the public. The objectives of all management actions are to achieve a balance between permitted private uses and resource protection for general public use. This plan is prepared for each Corps project where private shoreline use is allowed. Private shoreline uses may be authorized in designated areas consistent with approved use allocations specified in the Shoreline Management Plan.

The Shoreline Management Plan for Lake Oahe was last approved in 1977. An update of the plan is scheduled for the near future.

Seaplane Landing Plan. In order to provide for the safe and compatible use of seaplanes with other project purposes, the Omaha District has established a plan that applies uniform policies and rules for all Corps-managed lakes in the Omaha District. Lake Oahe is open to seaplane activities subject to the rules, regulations, and restrictions contained in the Seaplane Landing Plan, delineated on the maps attached to that report, and defined in ER 1130-2-411.

Cultural Resources Management Plan (CRMP). The CRMP provides detailed information on a comprehensive program to direct historic preservation compliance activities and the effective and

responsible management of historic properties and other cultural resources. Volume I of The Oahe Cultural Resources Management Plan is available to the public and may be found on the Corps website at (https://nwo.usace.army.mil/CRMP/CRMP.html) or it may be requested from the Oahe project office.

General Plan. Guidelines for General Plans are found in Section 663(b) of the Fish and Wildlife Coordination Act (Public Law 85-624). The use of Lake Oahe lands and waters for wildlife conservation purposes shall be in accordance with a General Plan approved jointly by (1) the Corps, (2) the Secretary of the Interior, and (3) the Director of the South Dakota Department of Game, Fish and Parks and/or the Director of the North Dakota Game and Fish Department. The signature by the Secretary of the Interior represents coordination with the USFWS and the BIA.

North American Waterfowl Management Plan (NAWMP). In 1989, the Department of the Interior and the Corps signed a Memorandum of Understanding (MOU) in support of the NAWMP. The NAWMP is a guideline for cooperation between public and private groups for restoring waterfowl habitat and populations to the same numbers as the early 1970s. The NAWMP will be implemented through joint ventures of public and private groups. The NAWMP identified 34 key areas nationwide to focus on for waterfowl habitat restorations.

There have been five key areas along Lake Oahe that have been identified for restoration activities. In South Dakota, these include the West Shore Area, Little Bend Natural Area, and Blue Blanket Area. In North Dakota, Carlson Bottom and MacLean Bottom are both included as key sites. All of these areas have undergone recent impoundment constructions for the benefit of a variety of waterfowl.

Biological Opinion. In 1989, the U.S. Army Corps of Engineers initiated consultation with the USFWS regarding operation of the Missouri River Main Stem Reservoir System. This consultation was conducted under the provisions of Section 7 of the Endangered Species Act (ESA), which requires Federal agencies to consult with the Service when the agency's proposed actions may affect the status of species listed as endangered or threatened.

In 2000, the USFWS issued a Biological Opinion covering operations of the Missouri and Kansas Rivers as well as the Missouri River Bank Stabilization and Navigation Project. The 2000 Biological Opinion found that actions proposed by the Corps would jeopardize the existence of the least tern, pallid sturgeon, and piping plover but not jeopardize the bald eagle. In the Biological Opinion, the USFWS described reasonable and prudent alternatives (RPA's) to reduce the impacts of Corps operations on the least tern, pallid sturgeon, and piping plover and reasonable and prudent measures to minimize impacts on the bald eagle.

Because of new data on mortality of terns and plovers, the 2002 designation of critical habitat for the piping plover, and new information on RPA element II, on November 3, 2003, the Corps reinitiated formal consultation. In the 2003 biological opinion, the USFWS retained most of the measures included in the previous biological opinion, but also incorporated a performance-based approach that allows

greater flexibility while providing equal or greater biological benefits to all three listed species as compared to the 2000 biological opinion. Both biological opinions included information specific to the status and management of least terns, piping plovers, pallid sturgeon, and bald eagles at Lake Oahe.

SUMMARY - IMPLICATIONS FOR PLANNING

The preceding discussion of the natural and historic resources identified the following important implications for the use, management, and development of land and water resources at the Oahe Dam/Lake Oahe project.

DESCRIPTION OF THE RESERVOIR

Lake Oahe extends 231 miles north from Oahe Dam. The reservoir has a maximum operating pool elevation of 1620 ft. m.s.l. and has more than 2,200 miles of shoreline. Five major tributaries empty into Lake Oahe - the Heart and Cannonball Rivers in North Dakota and the Grand, Moreau, and Cheyenne Rivers in South Dakota. A special problem that must be considered for its impacts on recreation activities is the presence of submerged and emergent standing trees in the reservoir.

LAKE OPERATION

Lake Oahe provides a significant storage contribution to the main stem reservoir system. The lake is the second largest of the six reservoirs, with a storage capacity of 23.1 million acre-feet. Lake Oahe, along with the remaining main stem lakes, is regulated on a repetitive annual cycle.

Several activities are directly impacted by fluctuations in lake surface area. Fluctuations in lake elevation have a harmful effect on the concessions along Lake Oahe and render some boat ramps unusable. In addition, although the warmer waters near the surface of Lake Oahe help in the development of a warm-water fishery, the amount of fish spawning habitat decreases as the lake level is drawn down.

HYDROLOGY AND GROUNDWATER

The drainage pattern for Lake Oahe is similar to the other main stem lakes. The Oahe drainage pattern is generally well defined on the west side of the lake. On the east side of the lake, much of the region does not contribute directly to stream flow unless substantial amounts of runoff occur. The regional groundwater flow system in which Lake Oahe lies includes aquifers in bedrock, glacial drift, and alluvium. The groundwater system is generally recharged by runoff and infiltration.

ICE AFFECTED FLOWS

The combination of aggradation and ice-affected flow conditions has dramatically increased the potential for flooding along the shoreline of Pierre and Fort Pierre during the wintertime as well as areas within the CRST and SRST preservations. The occasional peaking operations at the Oahe power plant cause rapid

changes in river stages in the Pierre and Fort Pierre areas and reservation areas that result in lowland flooding. Winter releases from Garrison Dam are carefully managed to reduce potential downstream impacts, however, the area may still be subject to ice jams and ice jam flooding.

SEDIMENTATION

The major sedimentation processes affecting Lake Oahe are transport and deposition of watershed sediments into the reservoir, littoral drift, and erosion of shoreline banks. Major sediment deposition occurs at the mouth of the tributary streams as they enter Lake Oahe. Littoral drift causes the formation of bars or shoals across bays. The rate and extent of shoreline erosion is determined by the nature of the shore materials, the energy of the oncoming waves, and the tendency of the eroded material to form beaches.

WATER QUALITY

Several small communities and private residences in both South Dakota and North Dakota obtain their drinking water from Lake Oahe. The water quality monitoring program has detected several parameters with Lake Oahe that exceed South Dakota and North Dakota water quality standards. Changes in agricultural practices will have the greatest impact on reservoir water quality.

ACCESSIBILITY

Lake Oahe is located in north-central South Dakota and south-central North Dakota between Pierre, South Dakota, and Bismarck, North Dakota. The east side of Lake Oahe can be reached from U.S. Highway 83 and ND/SD Highway 1804 which run between Bismarck and Pierre; the west side of the lake can be reached from SD Highway 63 and ND/SD Highway 1806. There are only four east/west highways that provide access to both sides of Lake Oahe. Access to project lands other than designated recreation areas can be difficult in some locations because of the lack of good secondary roads.

CLIMATE

The Oahe project is located in a region noted for seasonal contrasts (extremes of weather conditions during the summer and winter months). Winters are long and cold especially when arctic air surges over the area. Summers are normally relatively mild but may experience short periods of extremely warm temperatures. Precipitation over the area usually occurs as snow during the winter months of November through March and as rain during the remainder of the year. Wind speeds are usually moderate at midday and almost calm at night.

TOPOGRAPHY, GEOLOGY, AND SOILS

The area to the east of Lake Oahe is characterized by gently rolling plains to steep glacial moraines. West of the lake, the topography is typically gently sloping to very steep with a few scattered buttes. The bedrock surrounding Lake Oahe consists of nearly flat sedimentary rock with older rock exposed in the southern part of the project and the younger rock exposed in the northern portion of the project. Soils within the project area vary in their suitability for road construction, facility development, and vegetative plantings.

LAND USE

Agricultural use accounts for the majority of the land in the counties bordering Lake Oahe. The remainder of the lands is devoted to recreation, wildlife, transportation, and urban areas.

BORROW AREAS AND UTILITIES

Major borrow areas used during the construction of the dam were located at the left abutment east of the powerhouse and northwest of the existing West Shore Recreation Area. At the present time, the only active borrow areas located on project land are the ORV area south of the dam and the area northwest of the West Shore Recreation Area.

STEWARDSHIP

Corps stewardship of Oahe project lands reflects priorities established by the Assistant Secretary of the Army for Civil Works and the Corps' National Stewardship Advisory Team. The first priority is to comply with all laws relating to endangered species, cultural resources, and mitigation. The second priority is to transition all poor or fair condition lands towards a sustainable ecosystem. This would include prairie restoration, control of noxious weeds, and preventing the loss of wetlands or native prairie. The third priority is to balance uses of project lands while maintaining a sustainable ecosystem in good to excellent condition.

VEGETATION RESOURCES

Native vegetation found on the Oahe project varies widely. Although much of the project region is dominated by a short grass ecosystem, a substantial number of tallgrass species occur in some areas. Riparian wetlands occur in the northern portion of the project where remnants of the old Missouri River forest can be found. Smaller embayments and narrow drainages are found in the central and southern portions of the lake. Bottomland woodlands are dominated largely by cottonwoods and are found predominantly in the upper portions of the major tributary drainages.

The fluctuation of the water level on Lake Oahe creates unique temporary vegetative layers. The annual rise and fall of the lake's elevation provides a changing seedbed that is constantly renewed. During consecutive years with lower water levels, shoreline vegetation levels dramatically increase which results in an increase in upland game, migratory birds, and big game populations.

FISH AND WILDLIFE RESOURCES

Walleye and northern pike are the main warm-water fisheries on Lake Oahe. Salmon and trout are among the species that were stocked in order to develop the cold-water fishery created after the formation of Lake Oahe. Catfish are often taken by the general public through shoreline fishing.

Because Lake Oahe lies within the central flyway, massive numbers of migrating waterfowl pass through the area each spring and fall. Densities of waterfowl along the lake in the fall make for some of the best waterfowl hunting in the entire country. In addition, many birds use Lake Oahe's open waters, shoreline,

marshes, and mud flats as either home or a migration route to a summer range. Upland game birds were significantly impacted by the loss of woody habitat when Lake Oahe was impounded.

Big game species on Oahe project lands are limited to mule deer, white-tailed deer, pronghorn, and wildlife turkey. A variety of small rodents, furbearers, and large predators can be found on project lands. The open water created by Oahe Dam attracts waterfowl to the area in the winter, which in turn attracts wintering bald eagles to Lake Oahe. Reptiles and amphibians are somewhat limited in terms of diversity on Oahe project lands.

RARE AND ENDANGERED SPECIES AND COMMUNITIES

Federally endangered species that may be observed in the project area include the interior least tern, whooping crane, black-footed ferret, American burying beetle, Topeka shiner, and the pallid sturgeon. Federally threatened species that may occur in the project area include the bald eagle and piping plover.

LAKE OAHE/LAKE SHARPE FISH AND WILDLIFE MITIGATION

Inundation of wildlife habitat brought about by the construction of the Oahe and Big Bend project is considered to have adversely affected nearly 400 species of animals that inhabited or migrated through the area. Food plots, tree plots, and dense nesting cover stands have been established in several areas around Lake Oahe to mitigate for the loss of habitat. Title VI land transfers constitute the terrestrial mitigation that satisfies Section 3 of the Fish and Wildlife Coordination Act and there are currently no lands within the Oahe project that are managed for mitigation.

VISUAL QUALITIES

From the highly irregular and rugged shoreline on the lower portion to the more rolling and gentle shoreline on the upper portion, the Oahe project adds a tremendous visual diversity to both South Dakota and North Dakota.

PALEONTOLOGY

The Missouri River trench is internationally known for fossil vertebrate and invertebrate remains. The vertebrates along Lake Oahe occur principally in the Late Cretaceous Pierre Shale. Although dinosaurs dominated the terrestrial deposits to the west, both vertebrate and invertebrate fossils were preserved in the marine deposits of the shallow seaway.

CULTURAL RESOURCES

The Oahe project has 1,959 historic and prehistoric sites located on Corps land, more than any of the other main stem reservoirs in the Omaha District. Cultural resource inventories of the project indicated that it was inhabited during five main periods -- Paleo-Indian, Archaic, Woodland, Plains Village, and Historic. Numerous actions have been identified to monitor, reduce, or eliminate impacts to cultural sites.

INTERPRETATION

Paleontological resources, isolated biological communities, and human history are features that could be addressed in an interpretive program at the Oahe project.

DEMOGRAPHICS

The Oahe project directly influences three areas: (1) the seven "Upper" counties immediately adjacent to the lake from Mobridge, South Dakota to the northern project boundary, (2) the seven "Lower" counties from Mobridge, South Dakota to the southern project boundary, and (3) the remaining counties in both North Dakota and South Dakota. According to the 2000 census, the 7 Upper Oahe counties together have a population density of 11.4 persons per square mile. The seven Lower Oahe counties together have a population density of 3.4 persons per square mile. The largest cities in the Oahe project area are Bismarck and Mandan, North Dakota and Pierre, South Dakota. There are two Sioux Indian reservations that border Lake Oahe, Cheyenne River and Standing Rock. Both of these reservations are located on the west side of the lake.

ECONOMIC CHARACTERISTICS

The average unemployment rates for the counties immediately adjacent to the Oahe project are lowest in the counties with larger cities and towns. The highest unemployment rates are found in the counties with limited job opportunities. This same trend also holds for the percentage of families with income below the poverty level.

In 2005, the total travel expenditures in North Dakota were over $3.4 million while in South Dakota, for 2005, the economic impact was over $809 million. In North Dakota roughly 31,250 jobs are tourism related. In South Dakota, this figure rises to nearly 33,590.

RECREATION

Recreation facilities at the Oahe project vary from well-developed campgrounds to primitive areas with few facilities. Topography, transportation patterns, and market area are all factors that have influenced the concentrated development of intensive-use recreational facilities on the east side of the lake, however, in the last few years, developments have been installed on the west side at Indian Memorial, Fort Yates, Walker Bottoms, and developments in Morton County. Because of the topography, some areas on the west shore do not lend themselves to extensive development like the east shore. However, several areas on the west side have been identified as future recreation areas.

Fishing is the major recreational activity participated in by visitors to the Oahe project. In addition, the project is an important regional resource for hunting and accounts for nearly 5 percent of the total project visitation. Much of the boating is related to fishing activities, however, sailboating, waterskiing, use of personal watercraft, tubing, and powerboating are also popular activities. Campgrounds around Lake Oahe are available for all levels of camping and provide a wide variety of facilities. Picnic facilities are available at most of the recreation areas. Swimming is a popular activity at Lake Oahe. There are four designated swimming areas located around Lake Oahe; however, many visitors swim and sunbathe along

the shoreline as well as at designated swimming areas.

Recreation trails are among the more popular outdoor-recreation facilities in both North Dakota and South Dakota. There are numerous trails (including nature trails, ORV trails, and hiking/biking trail) are located throughout the Oahe project to compliment various other activities.

VISITATION PROFILE - TRENDS AND DEMANDS

The varying topography, the fishery and hunting resources, the proximity of population centers, and the amount of recreation facility development all combine to make the Oahe project a major asset to the central Great Plains. The Oahe project accounted for over 24 percent of the total visitation to the Missouri River main stem system - the highest visitation of any of the other main stem projects. The recreation areas receiving the highest visitation are located adjacent to major transportation routes and population centers.

RELATED RECREATIONAL, HISTORICAL, AND CULTURAL AREAS

Numerous recreational areas are present in central South Dakota and North Dakota and offer recreation activities that are both similar to and different from those at the Oahe project.

REAL ESTATE

In total, approximately 352,677 acres of Government-owned land comprises the Oahe project. There are a total of 453 outgrants consisting of leases, licenses, easements, and permits on the project. There are 17 major park and recreation leases on the project. All project land available for interim grazing use within the Cheyenne River and Standing Rock Sioux Reservations has been deferred to tribal councils and the BIA.

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CHAPTER 3
SPECIAL ISSUES

This chapter provides an overview of the key administrative, social, and environmental factors that influence and constrain present and future options of use, management, and development of land and water resources at the Oahe project. This information supplements the discussion of the factors that influence resource development presented in Chapter 2. Considered together with resource objectives and development needs presented in Chapter 6, these factors determine the most appropriate uses of project resources.

TRIBAL JURISDICTION

Jurisdiction of hunting and fishing activities on Corps land within the Standing Rock Sioux and the Cheyenne River Sioux Reservations has been a significant concern for many years. In the 1993 case of South Dakota v. Bourland, the U.S. Supreme Court held that the Cheyenne River Sioux Tribe does not have jurisdiction to regulate non-tribal member hunting and fishing on Corps project lands located within the Cheyenne River Sioux Reservation. There has been no such decision rendered regarding the Standing Rock Sioux Tribe.

Under the Title VI land transfer, jurisdiction over the land and on land between the water's edge and the level of the exclusive flood control pool within the Cheyenne River Sioux Tribe's reservation boundary will be the same as that over land held in trust by the DOI on the CRST and that jurisdiction will follow the fluctuations of the water's edge. Jurisdiction over land and water owned by the Federal Government and held in trust for the CRST not affected by this title shall remain unchanged.

NOXIOUS WEEDS

Normal annual lake level fluctuations may expose extensive reaches of shoreline that provide prime habitat for several varieties of noxious weeds. The noxious weeds most commonly encountered at the Oahe project include Canada thistle, saltcedar, and leafy spurge.

Canada thistle is found predominantly in the southern portion of the project. Significant stands occur in the Blue Blanket, Little Bend, and Peoria Flats Areas as well as in nearly every drainage in South Dakota. Canada thistle is an opportunistic invader that proliferates as the water level in the lake is drawn down. Control of this species is difficult because of the inaccessibility of many areas.

Saltcedar, introduced as an ornamental, escaped cultivation and is naturalizing along waterways in the western US. Large plants can use 200 gallons of water a day, drying up small streams and ponds. Saltcedar forms a dense monoculture, provides poor wildlife habitat, and is difficult and expensive to control. The North Dakota Department of Agriculture and the Emmons County Weed Board have established a Lake Oahe Saltcedar Taskforce to address the saltcedar problem at Lake Oahe. The group consists of the Corps, the U.S. Department of Agriculture Animal and Plant Health Inspection Service, the USFWS, NRCS, BIA, North Dakota Department of Agriculture, South Dakota Department of Agriculture, North Dakota Parks and Recreation Department, NDGF, SDGFP, SRST, CRST, SRST-EPA, SRST Game and Fish Department, four counties in North Dakota, and eight counties in South Dakota.

Leafy spurge has been known as a toxic plant for hundreds of years. A native of Eurasia, it has become naturalized in most of North America east of the Rockies. Leafy spurge is found in scattered stands throughout the Oahe project; however, the most significant stands are found primarily in the North Dakota segment from Bismarck south to the Beaver Creek area. The bottomland riparian areas in this stretch are oftentimes difficult to access, making control of this species extremely difficult. In addition, as lake levels are drawn down, a new seedbed is continually exposed.

There are three other opportunistic invaders on Oahe project lands that are not classified as noxious weeds. Kochia, Russian thistle, and cocklebur are found in many areas of exposed shoreline, especially in the Mobridge, South Dakota area. Although these species are a nuisance when growing along the shoreline and can obstruct access to the lake, they do provide habitat for pheasant and deer. As the lake elevation raises, these species normally die out and provide exceptional fisheries habitat.

The Corps is responsible for weed control in the area below elevation 1620 feet msl. Many lease situations exist on Corps lands. The lessees are responsible for noxious weed control on project lands that are outgranted to them. However, many of these lessees do not practice an aggressive noxious weed control program on leased land.

Specific management practices for the control of noxious weeds are addressed in the Oahe OMP.

HIGH POOL AND LOW POOL MANAGEMENT ISSUES AND STRATEGIES

This section identifies and discusses the issues and concerns that are encountered as the reservoir transitions from high pools to low pools. These include land management conditions and operations of the Oahe project. High and low pool transition zones create a variety of issues and challenges to standard land management practices. Severe fluctuations in pool elevations require the Corps to implement unique land management practices to minimize their impacts. The collection and documentation of critical historical data and the identification of unique challenges

and strategies formulated to address land-based impacts is necessary for future planning and management of these facilities.

This high and low pool management strategy analyzes conditions at several pool elevations and provides strategies related to minimizing land based impacts, with emphasis on flood and drought conditions. Elevations and management protocols at "normal pool" provide a basis from which the high and low pool management strategies are formulated.

This management strategy identifies specific management elevation zones based on pool level ranges. This strategy then identifies the major issues that affect reservoir operations for the various zones, followed by descriptions of the management issues relevant for specific pool levels. As the reservoir pool goes through high or low periods, the land management strategies necessary for each elevation zone can be anticipated and executed. The closing sections of the management plan provide the management strategies and recommendations for the high and low pool zones.

POOL OPERATING CONDITIONS

a. High Pool Operating Conditions (Exclusive Flood Control Pool) –Elevation 1620 – 1617 feet m.s.l. High pool operating conditions are those comprising the exclusive flood control pool and are defined as the reservoir surface between elevations 1620 and 1617 feet m.s.l. The highest historical elevation of the pool was at elevation 1618.71 feet m.s.l. and occurred in 1995. If the pool were to exceed elevation 1620 feet m.s.l., water would begin to flow unrestricted over the emergency spillway, limiting further increases in pool elevation. Two elevation zones are identified for high pool conditions and these are discussed in detail later in this section.

During high pool events, impacts to project operations increase and the need for monitoring, maintenance, and evaluation increases. The ability to control downstream releases is reduced, the potential for damage to the dam is increased, and portions of multiple recreation facilities become inundated and temporarily unusable. The increased monitoring and evaluation schedule needed for the project's structures and facilities can be found in the Operation and Maintenance Manual.

b. Normal Operating Conditions (Flood Control and Multiple Use Pool) – Elevation 1617 and 1607.5 feet m.s.l. (NAVD29). "Normal" operating conditions, for the purpose of this document, has been defined as the reservoir elevation between 1617 and 1607.5 feet m.s.l. using the NAVD29. Minimal impacts to project operations are expected during these conditions since routine operations and maintenance will continue. As the water level approaches the extremes of this range, however, heightened awareness of project conditions should be realized.

c. Low Pool Operating Conditions (Carryover Multiple Use Pool)- Elevation 1607.5 and 1540 feet m.s.l. Low Pool operating conditions are defined as the reservoir surface between elevations 1607.5 and 1540 feet m.s.l. The historic low of the reservoir (elevation 1570 feet m.s.l.) occurred in August 2006. The minimum operational pool elevation for the project is 1540

feet m.s.l., which corresponds to the lowest elevation at which the Corps can complete its power generation mandate. The impacts associated with low pool elevations also increase the need for monitoring, maintenance, and evaluation. The range of land management issues is more varied and complex for the low pool elevations than the high pool elevations. Six elevation zones are identified for low pool conditions. These are discussed in detail later in this section.

DEFINITION OF ISSUES

On the Oahe project, many management responsibilities in South Dakota were changed through the Title VI land transfer; however, land management in North Dakota was not affected by this legislation. (The Title VI land transfer has been addressed in the Real Estate section of Chapter 2.) Under the provisions of Title VI, the Corps retains fee title to lands and structures necessary for the operation of the Oahe dam and related flood control and hydropower structures, including land below elevation 1620 feet m.s.l. Lands located near the Oahe Dam were retained for operational purposes. The remaining recreation lands in South Dakota have been leased in perpetuity to the SDGFP.

a. Recreation and Reservoir Access. Recreation use is affected by both high and low water levels presenting challenges for boaters, fishermen, swimmers, water skiers, jet skiers, and campers. Impacted facilities can include boat docks, boat ramps, parking areas, sanitation facilities, picnic grounds, campsites, and swimming facilities. Recreation usage may change during low water conditions as access to the water becomes more difficult or more limited. Reduced access to the water may require users to find alternative access points which may result in overcrowding of those facilities still usable.

Reservoir access facilities such as boat ramps and shoreline roads were originally constructed at several locations around the reservoir to provide access to the water for recreation. Many of the ramps have been extended, some multiple times, to various lengths and varying elevations around the reservoir. All these facilities can be greatly affected by high and low water levels. Low reservoir levels leave some ramps high and dry whereas high water events can cover ramps, parking facilities, and access roads. In order to function properly, the access ramps require at least three feet of water over the lower end of the concrete ramp. Exposure of the lower ends of the ramps during low water can also contribute to undercutting and erosion problems leading to damage to the concrete. High water levels can inundate the tops of ramps and cause erosion damage or inundate access roads temporarily reducing access and increasing maintenance costs. Hard pack gravel roads above high water typically remain intact; however roads below high water are temporary and require continual monitoring and repairs.

Access ramps at Lake Oahe are grouped into four categories based on the agency responsible for management. Special funding for maintenance of high or low water effects is dependent upon the categorical designation of the ramp. The four access ramp categories are as follows:

- Category 1 – These access ramps are Corps built ramps that are managed and maintained by the Corps. Ramps in this category were initially built by the Corps with operation and maintenance funding obtained though standard budgetary processes. The Corps has direct management of these areas. There are no Category 1 ramps in the State of South Dakota portion of the Oahe project as management of all Corps ramps in South Dakota has been transferred to SDGFP.

- Category 2 - Corps built ramps that are managed and maintained by other agencies. Lease agreements have been entered into with Tribal, State, or local governments by the Corps to clearly identify that the Corps is not responsible for any management or maintenance.

- Category 3 - Ramps constructed using shared costs. The Corps shared ramp expenses with other agencies and these facilities are managed and maintained by another agency. The Corps has the ability to partner with an agency for the development of recreational facilities.

- Category 4 - Other agency built ramps that are managed and maintained by other agencies. These facilities were allowed to be constructed on land managed by the Corps. The Corps provides no funding nor accepts any managerial or maintenance responsibilities for these facilities. All ramps in recreation areas that were transferred to SDGFP or CRST under Title VI are included in this category.

A complete list of all boat ramps and funding categories are listed on Table 3-1.

Marinas provide many amenities to water-oriented visitors. However, the elevation of the water in the marina harbor determines its serviceable use. Services can include boat ramps, boat docks, long and short term mooring facilities, fuel service, sanitation services, mechanic services, grocery, sundries, camping, swimming, and outdoor sports. The use of marinas by the boating public assists in protecting the reservoir environment by providing sanitation facilities and pick up and disposal of petroleum products.

Dock and mooring facilities must be continually adjusted to an appropriate depth to avoid damage to boats. Because sail boats and deep hull vessels require deep water, these types of boats are impacted first. Severe low water conditions may require the abandonment of docks and mooring facilities because the water is too far from the marina. The removal of docks restricts if not eliminates the ability for boaters to access fuel and sanitation. As facilities are removed or closed, other ancillary services are affected. Many marinas have cabins, camping facilities, restaurants, and bait shops. These services rely primarily on the patronage of boaters. The closure of slip and dock services dramatically affects the revenue of the entire marina.

Table 3-1
Lake Oahe Boat Ramps

Area	Funding Category	Top Elevation (feet m.s.l.)	Low Elevation (feet m.s.l.)	Managing Agency
Beaver Creek	1	1618	1598	COE
Beaver Creek Beach - Low Level	1	1600	1592	COE
Beaver Creek North - Low Level	1	1600	1585-R*	COE
Bob's Resort/Highway 212 Bridge	4	1618	1566	PRIVATE
Bush's Landing	4	1618	1593	SDGFP
Bush's Landing - Low Level	4	1598	1565	SDGFP
Chantier Creek	4	1620	1584	SDGFP
Cow Creek	4	1620	1567	SDGFP
Dodge Draw	4	1618	1581	SDGFP
East Shore	2	1618	1573	SDGFP Lease
East Whitlock	4	1620	1600	SDGFP
East Whitlock - Low Level	4	1603	1577	SDGFP
Forest City	4	1617	1590	SSGFP
Foster Bay	4	1618	1598	SDGFP
Ft. Rice	2	1620	1595	Morton County ND
Ft. Yates	2	1618	1597	SRST Lease
Graner Park	4	1624	1611-R*	Morton County ND
Hazelton	1	1620	1593	COE
Indian Creek East	4	1620	1597	SDGFP
Indian Creek East - Low Level	4	1601	1563	SDGFP
Indian Creek West	4	1620	1563	SDGFP
Indian Memorial - Jed's Landing	4	1618	1597	SRST LEASE
Indian Memorial - Campground	3	1589	1567	SRST LEASE
Indian Memorial - North	2	1620	1575	SRST LEASE
Kimball Bottom	2	1624	1616-R*	Burleigh County ND
Langelier Bay	4	1618	1590	Emmons County ND
Lighthouse Point	4	1620	1575	SDGFP
Little Bend	4	1620	1600	SDGFP
Little Bend - Low Level	4	1605	1565	SDGFP
Little Heart	4	1624	1616-R*	Morton County ND
MacLean Bottom	4	1624	1610-R*	Emmons County ND
Minniconjou	4	1618	1569	SDGFP
Okobojo Point	4	1620	1607	SDGFP
Peoria Flats	4	1618	1590	SDGFP
Pike Haven	4	1620	1570	SDGFP
Prairie Knights - Campground	4	1624	1600	SRST lease
Rousseau Recreation Area	4	1623	1578	CRST/BIA
Shaw Creek	4	1618	1591	SDGFP
Shaw Creek - Low Level	4	1600	1567	SD GFP
South Whitlock Resort	4	1620	1589	PRIVATE
Spring Creek	4	1620	1562	SDGFP
Sutton Bay	4	1620	1600	SDGFP
Sutton Bay - Low Level	4	1605	1573	SDGFP
Swan Creek - Primary	4	1618	1573	SDGFP
Swan Creek – High Water	4	1619	1594	SDGFP
Swan Creek – Low Level 1	4	1598	1585	SDGFP
Swan Creek - Low Level 2	4	1579	1566	SDGFP

Thomas Bay	4	1618	1587	SDGFP
Walker Bottom	2	1604	1584	SRST Lease
Walth Bay	4	1618	1564	SDGFP
West Pollock North	4	1618	1583	SDGFP
West Pollock North - Low Level	4	1587	1573	SD GFP
West Shore	2	1620	1570	SDGFP Lease
Whitlock's West	4	1620	1567	SDGFP
Winona/Cattail Bay	1	1620	1587	COE

R* Elevation at bottom of ramp is in river conditions. These ramps are affected more by discharges from Garrison dam than on Lake Oahe pool levels.

Shoreline day use and ORV (in areas approved) use are popular on the reservoir. High pool conditions eliminate the opportunities for this type of recreation because of the loss of shoreline as a result of inundation. Low pool conditions provide shoreline availability for unrestricted and uncontrolled access and can result in severe damage to other reservoir resources such as threatened or endangered species and cultural resources. The extensive areas of bare shoreline exposed by low pool conditions provide a tempting draw for ORV use. Continued monitoring and control methods are necessary to protect fragile natural resources.

Cabin sites, docks, campgrounds, domestic waterlines, parking areas, and playgrounds are all affected by high and low pool conditions. Many of these facilities are inundated during extreme high water events. These same facilities that are conveniently near a reservoir access point during normal pool conditions may be far away from the reservoir access during periods of low water.

b. Cultural and Historic Resources. Cultural resource sites are at risk of being adversely affected by environmental and human factors any time the water level fluctuates. Cultural resource site density along the Missouri River is high with pre-historic and historic sites located along the original river channel and on the surrounding bluffs and plains. Nearly all sites are affected by the changing water elevations but this issue is most critical at the extreme high and low water elevations. Sites covered by water during normal pool operating levels are potentially affected by low water conditions because they may be exposed and subject to wave action, wind erosion or looting. Sites above the normal pool operating levels may be damaged through erosive wave action or exposed once the water level drops. Regardless of the operating condition, the National Historic Preservation Act requires that archeological sites that are eligible or potentially eligible for listing on the National Register of Historic Places be preserved and protected from adverse effects.

c. Bank Erosion. Bank erosion caused by wave and wind action is an issue of concern at all reservoir levels; however, it becomes a particular concern at the extremes of the pool elevations. Areas that are not often subjected to wave action are exposed to the wind and waves. Essential facilities (e.g. roads, ramps, docks, etc) and/or areas of particular safety concern (e.g. unstable banks near recreation areas) are of first importance. Erosion is also a concern with regard to cultural issues and municipal water intakes. Erosion can expose or damage cultural or historic

resources, cause turbidity that can clog water intakes and impact water treatment, or damage water intake structures.

d. Invasive Species. Invasive species include both water-borne species (i.e. zebra mussels and Eurasian milfoil) and noxious weeds (i.e. saltcedar, Canada thistle, and leafy spurge). Curly leaf pondweed is documented to be on the project. Eurasian milfoil has been noted but not documented and confirmed. Some invasive species are considered noxious weeds through State and/or Federal designations. Several noxious weed species thrive in low pool conditions and tend to be species that specialize in colonizing and thriving in disturbed environments such as the newly exposed reservoir shoreline. As noxious weeds spread quickly on the exposed soils and gain a foothold they can then more easily spread to adjacent farms and ranches. The primary noxious weeds that threaten the exposed shorelines of Lake Oahe are Canada thistle (*Cirsium arvense*), saltcedar (*Tamarix ramosissima, Tamarix chinensis,* and *Tamarix parviflora*), and leafy spurge (*Euphorbia esula*). Saltcedar poses an immediate threat to the natural resources around the reservoir. At all operating levels (high, low, and normal) adjacent disturbed land is susceptible.

e. Water Intakes. Municipal water supply intakes may be threatened by the receding of the reservoir pool during low water conditions. The reservoir provides public drinking water through six intake locations to several communities (approximately 100,000 individuals) and individual homes. The reservoir level required for a given intake structure to operate properly varies. Exposure of municipal water intake structures can result in turbidity issues with the water supply, shut down of the facility, or collapse of the intake pipes because of erosion of adjacent banks.

Irrigation intakes are also impacted primarily by low water levels but are the responsibility of the individual owners. The owners generally extend their lines to follow the water down into the reservoir as the pool level recedes. Both land mangers and owners need to be aware of this issue as reservoir levels rise and fall. Contingency plans for pump relocation, with input from both parties, are advantageous to facilitate emergency actions.

f. Threatened and Endangered Species. The foraging and nesting activities of two threatened and endangered bird species are impacted by changes in pool elevation. The interior least tern (*Sterna antillarum athalassos)* and piping plover (*Charadrius melodus*) are two shorebirds that feed and raise their young on the shores of the Missouri River and reservoir beaches. The least tern is a pale grey swallow-sized bird that tends to nest west of the reservoir on sand bars in riverine conditions.

The reservoir area provides habitat primarily for the piping plover, a sandy brown robin-sized shorebird. A steady drop in reservoir elevations provides for an optimum increase in potential nesting habitat for the piping plover. The piping plover prefers the newly exposed open shorelines for nesting that are provided by a steady drop in the reservoir elevation. However, this

habitat is short lived as within one to two years vegetation will encroach and colonize the open shores and eliminate the open habitat. The additional vegetative growth that accompanies lower elevations also decreases the critical foraging areas and increases opportunities for predators. Changes in foraging habits can adversely affect the survival of chicks and adult birds. High grass and weeds along the shoreline will discourage piping plovers away from ideal feeding locations. Vegetation also provides cover for predators such as snakes, raccoons, and skunks to destroy nests. Nests can be concentrated on ideal sandy soil but in limited areas, endangering a large percentage of the population by allowing predators easy access.

The downward transition to low pool conditions has the potential of providing optimum conditions for these endangered species. As the reservoir level drops new habitat is continually exposed. Because very little sedimentation occurs in the upper end of the reservoir, as the elevation of Lake Oahe goes down, the upper end reverts to riverine conditions that are not encumbered by sediment, which enhances habitat for bird species. If low pool elevations persist, however, some habitat will be overgrown with vegetation. Year to year the more important factor for the endangered bird species is the short-term rise and fall of the reservoir pool.

Higher water levels pose the greatest issues for the endangered birds because nearly all of the prime habitat areas would be inundated by the rising water. As reservoir elevations enter the flood control zones the open expanses of shoreline begin to disappear. At high pool elevations habitat is eliminated on almost the entire reservoir except for an area known as Dredge Island on the east side of the lake across from the mouth of the Cannonball River.

One additional endangered species potential habitat could occur in the reservoir. The pallid sturgeon (*Scaphirhynchus albus*) is a bottom dwelling fish that prefers large, free-flowing, warm turbid water, with a vast array of physical habitat conditions that are in a constant state of change. The low water pool conditions may have beneficial effects for pallid sturgeon in that riverine habitats are exposed in the upper end of the reservoir. These areas would provide habitat conditions that were not previously available under full reservoir conditions. Additionally, the sturgeon depends on spring runoff conditions to trigger their spawning migrations and these conditions would be more prevalent in the upper reservoir with low pool elevations .

g. Coldwater and Warmwater Fish Habitat. Coldwater fish habitat is important for the Chinook salmon (*Oncorhynchus tschawytscha*), lake herring (also known as northern cisco) (*Coregonus artedi*), and rainbow smelt (*Osmerus mordax*) fisheries on the reservoir. Chinook salmon are a stocked species in the reservoir and are an important game fish. The lake herring and rainbow smelt are important as a prey base for the reservoir. In past years other coldwater game fish species have been stocked in the reservoir including steelhead and rainbow trout (*Oncorhynchus mykiss*), lake trout (*Salvelinus namaycush*), and brown trout (*Salmo trutta*).

The coldwater habitat is impacted by low pool conditions. The lowering of the pool elevation tends to reduce the cold water layers vertically and also reduces the extent of the cold water pool

horizontally to the area nearest the dam. With this reduction of the habitat comes increased predation, crowding of the fish, oxygen depletion in the water, increasing susceptibility to disease, and reduced spawning success. The stress on both the fishery and reduced spawning success impacts sport fishing on the reservoir. The reduction of prey populations seriously reduces the forage base for sport fishing species on the reservoir.

The high and low pool levels are essentially a non-issue for the warmwater fisheries in Lake Oahe. The species comprising the warmwater fishery have a wider range of temperature tolerances than do the species that comprise the coldwater fishery. Maximum temperatures experienced in Lake Oahe do not pose a threat of exceeding the range of temperatures that these species typically inhabit. Therefore, warmwater fisheries will not be discussed in the high/low pool elevation zones.

h. Land Management. As the lake level transitions to low pool events, the receding water may expose nearly twice as much land area to be managed as when the pool is at higher levels. Between elevations 1620 and 1607.5 feet m.s.l. (the bottom of the normal pool elevation) there is approximately 106,000 acres of exposed land that must be managed. The additional amount of land exposed when the lake level drops from elevation 1607.5 feet m.s.l. to elevation 1570 feet m.s.l., the record low elevation, is 131,782 acres. The change in the amount of exposed land is illustrated by low pool elevation zone in Table 3-2 below. At such a scale, for the Oahe project this becomes an issue of personnel and resources to try to cover all of the management issues that may arise over such a greatly increased area to be managed.

Table 3-2
Acres of Exposed Land by Low Pool Zone

Pool Zone	Elevation (feet m.s.l.)	Additional Exposed Land (acres)	Total Increase in Exposed Land (acres)
Normal	1617-1607.5	0	0
Low Pool Zone 1	1607.5-1600	33,705	33,705
Low Pool Zone 2	1600-1589	38,930	72,635
Low Pool Zone 3	1589-1579	32,300	104,935
Low Pool Zone 4	1579-1564	43,952	148,887
Low Pool Zone 5	1564-1554	26,205	175,092
Low Pool Zone 6	1554-1540	23,063	198,155

Because of frequent high wind events and the open and relatively dry conditions at the Oahe project, the lands surrounding the reservoir are subject to periodic wildfires. Recreation areas are both potentially at risk of loss or damage from wildfire. These same areas run the risk of being the sources of wildfire through campfires and other recreation related activities. Sustained low-water periods can expose shorelines leading to colonization by vegetation. This, in turn,

increases the risk of wildfire to areas by completely surrounding recreation sites that were originally adjacent to the shoreline.

i. Safety and Health Hazards. High and low pool elevations present a variety of safety and heath hazards to all users of the reservoir. Hazards such as sandbars, stumps, logs, and trees may become exposed or lie just below the surface of the water during low and high pool elevations in areas that pose no hazard with normal pool elevations. As the water level decreases within the reservoir, some areas may still retain stumps or logs that have floated into the reservoir and are lodged on the bottom and present an unforeseen hazard to reservoir users. Blowing sand and dust from newly exposed shorelines and slopes can also pose safety risks with low pool elevations. During high water events, trees at the reservoir edge become submerged along with fences and other structures. These can all pose dangerous underwater hazards for recreational users.

Additionally, as the water levels go down in the reservoir, neighboring farmers often have to chase the water level down with fences to keep livestock contained. Theses "tag" fences then need to be removed promptly when water levels increase to prevent them from becoming a hazard as the water level rises over them.

j. Facility Maintenance. Low pool elevations do provide for the opportunity to carry out needed maintenance of facilities and shorelines. As facilities are exposed at lower reservoir levels maintenance crews have easier access for repair and reconstruction of docks, ramps, erosion control structures, and other facilities. Areas of erosion on the shoreline can be repaired and cultural resources can be secured.

ELEVATION ZONES – ISSUES, OPPORTUNITIES AND MANAGEMENT STRATEGIES

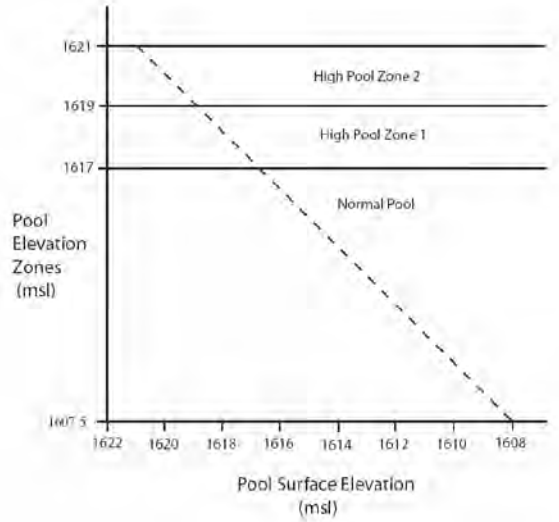
a. High Water Operating Conditions—Elevation 1620 to 1617 feet m.s.l. The exclusive flood control pool for the Oahe project is between elevations 1620 and 1617 feet m.s.l. The highest historical elevation of the pool (elevation 1618.71 feet m.s.l.) occurred in 1995. At elevation 1620 feet m.s.l. the water spills over the emergency spillway and there is no additional storage capability. There are two high water pool elevation zones which are shown on Figure 3-1 and are discussed in detail later in this section.

No matter what the high water elevation, there are similar issues to be overcome, opportunities to be taken advantage, and strategies to implement.

Issues

- Recreation access – As the reservoir level exceeds the normal operating pool (elevation 1617 feet m.s.l.), recreation facilities begin to be impacted by the high water. Swimming beaches, camping sites, parking areas, and dock facilities can be affected. Erosion at

Figure 3-1
High Water Elevations Zones



beaches, access roads, and ramps can disrupt recreation use and docks and ramps must be adjusted to the high water levels.

- Cultural and historic resources – Wave action may endanger sites that are currently intact. Refer to the Cultural Resources Monitoring Plan (CRMP) for more specific details.

- Erosion problems – Exposed cliffs and banks above the normal operating pool will begin to experience erosion problems. Exposed recreation areas and some residential sites are most at risk. Severe erosion and bank slumping will occur along the whole shoreline in North Dakota and South Dakota. Erosion at beaches, access roads, and ramps can disrupt recreation use and docks and ramps must be adjusted to the high water levels.

- Safety and Health Hazards – Around the edges of the reservoir inundated fences, trees, logs, and other structures begin to present safety hazards for recreation users.

Opportunities

- Invasive Species – The high pool elevation does provide some benefit by drowning out and reducing some of the invasive species growing on the shoreline of the reservoir. Infestations of salt cedar can be somewhat controlled if the root crowns are inundated at least three months.

Management Strategy

- Reservoir Access and Recreation - As forecasted reservoir levels approach any High Pool Elevation, a communications strategy should be implemented for ramps and recreation facilities that are affected by high water conditions. During high water elevations ramps

will need to be closed or are open but subject to damage. Additionally, swimming areas, campsites, playgrounds, and access roads will be affected.

- Bank Erosion - Intense monitoring of at risk structures is recommended, such as concrete ramps and access roads, be implemented. Particular attention should be paid to areas of significant erosion, which could pose a threat to public safety, or threaten the structure itself.

- Facility Maintenance - Maintenance and monitoring of closed areas should continue to the extent possible. Refuse collection, mowing, cleaning, and grounds maintenance are necessary to protect areas from deterioration. Neglect will reflect poorly on the Corps and increase start up expenses when areas are re-opened. Neglect may also lead to unauthorized use, which may increase law enforcement expenses.

Specific issues, opportunities, and management strategies for the two high water zones are identified below.

(1) High Pool Elevation Zone 1 – Elevation 1617 to 1619 feet m.s.l.

Issues

- Reservoir access ramps – Within this high pool elevation zone several reservoir access ramps are no longer useable because either they are completely under water or there is not enough room left at the top of the ramp to effectively launch a boat.

As the reservoir level rises to an operating range between elevation 1617 and 1619 feet m.s.l., 30 of the 54 water access ramps must be closed. The affected ramps affected are shown on Table 3-3.

(2) High Pool Elevation Zone 2 – Elevation 1619 to 1620 m.s.l.

Issues

- Reservoir access ramps – As the reservoir level rises between elevations 1619 and 1620, 18 additional water access ramps are closed. These ramps are listed in Table 3-4.

There are still six boat ramps with top elevations above 1620 feet m.s.l. that would continue to be operational. These boat ramps are Graner Park, Kimball Bottom, Little Heart, MacLean Bottom, Prairie Knights – Campground, and Rousseau Recreation Area.

- Flood storage – The high pool elevation eliminates the capability for flood storage. Above elevation 1620 m.s.l. the excess water in the lake would flow through the emergency spillway.

Table 3-3
Closed Ramps - High Pool Zone 1

Area	Closure Elevation (feet m.s.l.)
Beaver Creek	1618
Beaver Creek Beach - Low Level	1600
Beaver Creek North - Low Level	1600
Bob's Resort/Highway 212 Bridge	1618
Bush's Landing	1618
Bush's Landing - Low Level	1598
Dodge Draw	1618
East Shore	1618
East Whitlock - Low Level	1603
Forest City	1617
Foster Bay	1618
Ft. Yates	1618
Indian Creek East - Low Level	1601
Indian Memorial - Jed's Landing	1618
Indian Memorial - Campground	1589
Langelier Bay	1618
Little Bend - Low Level	1605
Minniconjou	1618
Peoria Flats	1618
Shaw Creek	1618
Shaw Creek - Low Level	1600
Sutton Bay - Low Level	1605
Swan Creek - Primary	1619
Swan Creek –Low Level 1	1598
Swan Creek - Low Level 2	1579
Thomas Bay	1618
Walker Bottom	1604
Walth Bay	1618
West Pollock North	1618
West Pollock North - Low Level	1587

Opportunities

- There are no additional management opportunities provided at this lake elevation.

Management Strategies

- Reservoir Access and Recreation - As forecasted reservoir levels approach the High Pool Elevation Zone 2, the communications strategy should be widened to include the additional ramps and recreation facilities that are affected by high water conditions. In cooperation with stakeholders, access roads should be monitored for possible damage from high water elevations.

b. Normal Operating Conditions—Elevation 1617 to 1607.5 feet m.s.l.. Between elevations 1617 and 1607.5 feet m.s.l. the reservoir pool is at normal operating conditions.

Table 3-4
Additional Closed Ramps - High Pool Zone 2

Area	Closure Elevation (feet m.s.l.)
Chantier Creek	1620
Cow Creek	1620
East Whitlock	1620
Ft. Rice	1620
Hazelton	1620
Indian Creek East	1620
Indian Creek West	1620
Indian Memorial North	1620
Lighthouse Point	1620
Little Bend	1620
Okobojo Point	1620
Pike Haven	1620
South Whitlock Resort	1620
Spring Creek	1620
Sutton Bay	1620
West Shore	1620
Whitlock West	1620
Winona/Cattail Bay	1620

Issues

- Recreation Access - The majority of the recreational and other facilities are designed to operate within this elevation range. Four access ramps on Lake Oahe are more affected by releases from Garrison dam than the actual Oahe lake level. These ramps are located at the upper end of the lake. The other ramp at Okobojo Point was constructed as a high water ramp for sail boats and hobie cats. These ramps are listed in Table 3-5.

Table 3-5
Ramps Affected at Normal Operating Conditions

Area	Closure Elevation
Graner Park	1611-R*
Kimball Bottom	1616-R*
Little Heart	1616-R*
MacLean Bottom	1610-R*
Okobojo Point	1610

R* - Elevation at bottom of ramp is in river conditions. These ramps are affect more on discharges from Garrison Dam than on Lake Oahe pool levels.

At normal pool elevations there continue to be issues with erosion, dust and other hazards, cultural and historic resources, invasive species, and T&E species, but to a lesser degree. These issues are dealt with under the normal operating procedures of the reservoir and are discussed in detail in chapter 2 of this master plan.

- Cultural and historic resources – Wave action within the normal operating

conditions range may endanger sites that are currently intact. Refer to the CRMP for more specific details.

- Erosion problems – Exposed cliffs and banks within the normal operating pool do experience erosion problems.

- Invasive species – Invasive species may present problems during normal pool elevations in areas where open shoreline is common because of pool level fluctuations that occur with normal operation.

- Safety and Health Hazards – Trees, stumps, and logs may present safety hazards for recreation users even at normal pool elevations. Blowing dust and sand is a potential safety hazard at normal pool elevations in areas where open shoreline is common due to pool level fluctuations that occur with normal operation.

Opportunities

- T&E Species – The normal fluctuations of the reservoir pool provide shoreline access for nesting birds.

- Invasive Species -Normal water fluctuations regularly inundate invasive species growing along reaches of exposed shoreline.

Management Strategies

Management will continue as outlined in the OMP.

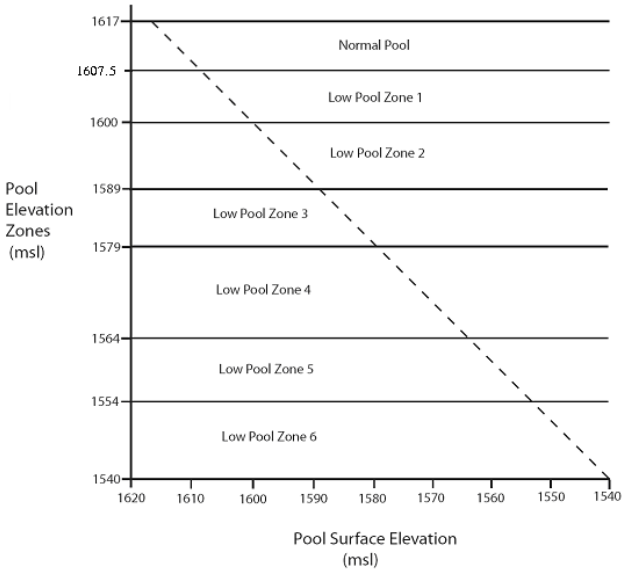
c. Low Water Operating Conditions—Elevation 1607.5 to 1540 feet m.s.l. Low pool operating conditions begin at elevation 1607.5 feet m.s.l. The reservoir minimum operational pool elevation is 1540 feet m.s.l., which corresponds to the lowest elevation at which the Corps can complete its operational mandates. The lowest historical elevation of the pool (elevation 1570 feet m.s.l.) occurred in August 2006. Figure 3-2 below illustrates the six low water pool elevation zones. These elevation zones are discussed in detail later in this section.

There are some issues, opportunities, and management strategies that are identical no matter what the low elevation.

Issues

- Cultural and historic resources - Low water conditions have the potential to expose normally inundated prehistoric and historic sites. This can lead to increased looting activity of the exposed properties. However, because of the sensitive nature of the cultural and historic resource sites, it is not possible to include specific elevations, data, or other information for the sites. Refer to the CRMP for more specific details.

Figure 3-2
Low Pool Elevation Zones



- Erosion problems – During low water conditions, wave action may induce damage to shorelines that are only minimally affected by erosion at higher elevations.

- Invasive species – As the reservoir elevation declines, the area of land susceptible to overgrowth by invasive species increases. The "land-clearing" action induced by the falling reservoir creates optimal conditions for the germination of weeds. Not only is control of the newly exposed areas necessary, eradication of the weeds that have previously become established is desired. This creates an enormous burden in terms of both manpower and monetary resources. Proactive measures, including close coordination with local weed boards, should continue in an effort to control weeds in the highest priority areas.

- Irrigation intakes – As the reservoir level falls irrigators must extend the irrigations intake structures into the water.

- Coldwater fish habitat - Maintenance of coldwater fish habitat becomes an issue as the reservoir level drops below elevation 1607.5 feet m.s.l. As the water elevation decreases, the reservoir pool begins collapsing the coldwater pool and the associated negative impacts begin.

- Safety and Health Hazards – Blowing dust begins to become more of an issue as larger expanses of open shoreline are exposed with the drop in water level. Areas particularly at risk are those close to population centers and popular recreation areas. Hazards such as stumps, logs, mudflats, sand bars, and shallow water also become more of a hazard within

this elevation zone. At low water there is more free-flowing river in the area downstream from Bismarck, which can pose hazards for recreational users.

Opportunities

- Facility Maintenance – Low water levels provide opportunities for conducting maintenance on reservoir facilities as areas usually underwater become exposed. Activities such as dredging and shoreline stabilization may be easier to complete than at normal pool elevations. There are also opportunities for photo documentation of problem areas and hazards.
- Wildlife benefits – The decreasing water elevation may provide some benefit for wildlife including nesting opportunities for T&E species—particularly in the first few years of the elevation drop. Additional miles of free-flowing river become available for the sturgeon at the upper end of the reservoir.
- Cultural resources – Low pool levels may provide an opportunity for cultural resource personnel to document sites that are not normally exposed. Low pool levels may also enable site stabilizations or other protective measures to be accomplished.
- Grazing –there may be more opportunity for grazing on the exposed shoreline adjacent to existing grazing parcels as the water level drops over a period of years and vegetation becomes established on the new shoreline

Management Strategies

- Reservoir Access and Recreation - Observations of access areas should increase and monitoring protocols should be instituted. The communications strategy for closures should be implemented. Recreation users should be directed to newly opened facilities.
- Cultural Resources - A cultural resources monitoring plan should be implemented. Coordinate with State and Tribal partners to assist in the implementation of a "maintenance and monitoring" program based on elevation zones and -highest priority resource areas. Newly exposed shorelines should be examined as soon as possible in order to accomplish tasks prior to the arrival of looters or emerging vegetation. Low elevation sites that require stabilization should have protective measures designed and ready to implement prior to the arrival of low pool elevations so they will be ready to roll out with the least amount of delay possible. Enforcement monitoring of vulnerable sites should be increased as a looting deterrent. All field personnel should be instructed in reporting procedures.
- Invasive Species - Monitoring of potential areas of concern should be increased and a spray program should commence. Annual spray and monitoring schedules should be developed focusing on areas most likely to be exposed within various low elevation zones.
- Threatened and Endangered Species - Begin a significant increase in T&E

species monitoring in areas identified as likely to provide necessary habitat within this elevation zone. Endangered species habitat should be identified, inventoried, and monitored on a seasonal basis.

- Coldwater Fish Habitat - Maintenance of coldwater fish habitat becomes an issue below elevation 1607 feet m.s.l. The fishery should be monitored for negative effects as a result of the decreasing lake elevation.

- Land Management - Land management efforts should be coordinated with local jurisdictions and interest groups.

- Facility Maintenance - For low pool elevation zones there is some increased project maintenance. These include clearing mud/debris from boat ramps, and excavating sediment from dry dock areas.

- Safety and Health Hazards - Communications strategies should be implemented for identified high priority safety hazard areas.

Specific issues, opportunities, and management strategies for the six low water zones are listed below.

(1) Low Pool Elevation Zone 1 – Elevation 1607.5 to 1600 feet m.s.l.

Issues

- Reservoir access ramps – Within Low Pool Elevation Zone 1, as the reservoir level drops from elevation 1607.5 to 1600 feet m.s.l., eight access ramps become unusable. However, there remain 40 usable ramps on the reservoir within this elevation zone. In order to be considered usable the ramps must be accessible and have at least three feet of water over the lowest portion of the ramp. The ramps closed are shown on Table 3-6.

There are five ramps that become available within this elevation zone. These are shown on Table 3-7.

- Land Management – As the water level drops from elevation 1607.5 to 1600 feet m.s.l., over 33,700 additional acres of land area are exposed that were previously underwater during normal.

Opportunities

- There are no additional management opportunities provided at this lake elevation over what was listed previously.

Table 3-6
Closed Ramps - Low Pool Elevation Zone 1

Area	Closure Elevation (feet m.s.l.)
Beaver Creek	1601
East Whitlock	1603
Fort Yates	1600
Foster Bay	1601
Indian Creek East	1600
Little Bend	1603
Prairie Knights - Campground	1603
Sutton Bay	1603

Table 3-7
New Open Ramps - Low Pool Elevation Zone 1

Area	Top Elevation (feet m.s.l.)
East Whitlock - Low Level	1603
Indian Creek East - Low Level	1601
Little Bend - Low Level	1605
Sutton Bay - Low Level	1605
Walker Bottom	1604

Management Strategies

- There are no additional management strategies identified for this lake elevation.

2. Low Pool Elevation Zone 2 – Elevation 1600 to 1589 feet m.s.l.

Issues

- Reservoir access – As the reservoir level drops between elevations 1600 and 1589 feet m.s.l., 13 additional access ramps become unusable. The access ramps closed are shown in Table 3-8.

The six low water ramps that become available within this elevation zone are shown on Table 3-9.

Table 3-8
Closed Ramps – Low Pool Elevation Zone 2

Area	Ramp Closure Elevation (feet m.s.l.)
Beaver Creek - Low Level	1602
Bush's Landing	1596
Forest City	1593
Ft. Rice	1598
Ft. Yates	1600
Hazelton	1596
Indian Memorial - Jed's Landing	1600
Langelier Bay	1593
Peoria Flats	1593
Shaw Creek	1594
South Whitlock Resort	1592
Swan Creek – High Water	1597
Thomas Bay	1590

Table 3-9
New Open Ramps - Low Pool Elevation Zone 2

Area	Top Elevation (feet m.s.l.)
Beaver Creek Beach - Low Level	1600
Beaver Creek North - Low Level	1600
Bush's Landing - Low Level	1598
Indian Memorial Campground	1589
Shaw Creek - Low Level	1600
Swan Creek - Low Level 1	1598

- Land Management – As the water level drops from elevation 1600 to 1589 feet m.s.l., over 38,930 additional acres of land area are exposed that are underwater during higher pool levels.

Opportunities

- There are no additional management opportunities provided at this lake elevation over what was listed previously.

Management Strategies

- There are no additional management strategies identified for this lake elevation.

(3) Low Pool Elevation Zone 3 - 1589 to 1579 feet m.s.l.

Issues

- Reservoir access – As the reservoir level drops between elevations 1589 and 1579 feet m.s.l., nine additional access ramps become unusable. One low water access ramp, West Pollock North Low Level, becomes usable within this elevation zone, leaving 20 usable ramps on the reservoir within this elevation zone. Table 3-10 lists the access ramps closed.

Table 3-10
Closed Ramps - Low Pool Zone 3

Area	Ramp Closure Elevation (feet m.s.l.)
Beaver Creek North - Low Level	1588-R
Chantier Creek	1587
Dodge Draw	1584
East Whitlock - Low Level	1580
Rousseau Area	1581
Swan Creek - Low Level 1	1588
Walker Bottom	1587
West Pollock North	1586
Winona/Cattail Bay	1590

R* - Elevation at bottom of ramp is in river conditions. Ramp is more affected on discharges from Garrison Dam than on the Lake Oahe pool elevation.

- Land Management – As water levels drop within Low Pool Elevation Zone 3 from elevation 1589 to 1579 feet m.s.l., over 32,300 additional acres of land area are exposed that were previously underwater during normal and high pool levels.

Opportunities

- There are no additional management opportunities provided at this lake elevation over what was listed previously.

Management Strategies

- There are no additional management strategies identified for this lake elevation.

(4) Low Pool Elevation Zone 4 – Elevation 1579 to 1564 feet m.s.l.

Issues

- Reservoir access – As the reservoir level drops between elevations 1579 and 1564 feet m.s.l., the remaining 18 access ramps become unusable. These are shown on Table 3-11.

Table 3-11
Closed Ramps - Low Pool Elevation Zone 4

Area	Ramp Closure Elevation (feet m.s.l.)
Bob's Resort/ Highway 212 Bridge	1569
Bush's Landing	1568
Cow Creek	1570
East Shore	1576
East Whitlock - Low Level	1580
Indian Creek - Low Level	1566
Indian Creek West	1566
Indian Memorial Campground	1570
Indian Memorial North	1578
Lighthouse Point	1578
Little Bend - Low Level	1568
Minniconjou	1572
Pike Haven	1573
Rousseau Recreation area	1581
Shaw Creek - Low Level	1570
Sutton Bay - Low Level	1576
Swan Creek - Low Level 2	1569
West Pollock North - Low Level	1576
West Shore	1573
Whitlock's West	1570

- Municipal intakes – Operational problems begin within this zone for four of the municipal water intakes. City of Mobridge has one intake (at three different levels) in the vicinity of the city . Standing Rock MR&I at Wakpala has the other intake. (These two intakes are being replaced by a lower elevation intake which is located near the Indian Memorial campground.)

For the City of Mobridge, the top of the currently used screen/intake is at elevation 1548 feet m.s.l. although operational problems begin at elevation 1575 feet m.s.l. This intake supports a population of approximately 3,600. Mobridge has three intakes at different elevations for their use.

For Standing Rock MR&I at Wakpala, the top of the intake is at elevation 1563 feet m.s.l. At Standing Rock MR&I at Fort Yates, the top of the intake is al elevation 1571.2 feet m.s.l. Operational problems begin at elevation 1568 and 1573 feet m.s.l., respectively. These intakes supports a population of approximately 15,000.

- Land Management – As the water level drops from elevation 1579 to 1564 feet m.s.l., roughly 43,952 additional acres of land area are exposed that were previously underwater during normal pool levels.

Opportunities

- There are no additional management opportunities provided at this lake elevation over what was listed previously.

Management Strategies

- There are no additional management strategies identified for this lake elevation.

(5) Low Pool Elevation Zone 5 - 1564 to 1554 feet m.s.l.

Issues

- Municipal intakes – Operational problems begin within this elevation zone for two additional municipal water intakes - WEB Water System and Mid-Dakota Rural Water System.

The WEB Water System intake is located just north of Walth Bay Recreation Area in Walworth County. The top of the intake is at elevation 1538 feet m.s.l. although operational problems are reported to begin at elevation 1562 feet m.s.l., which is 24 feet above the top of the intake. This intake supports a population of approximately 45,000.

The Mid-Dakota Rural Water System intake is located south of the East Shore Recreation Area in Hughes County. The top of the screen/intake is at elevation 1543 feet m.s.l.; however, operational problems begin at elevation 1555. This intake supports a population of approximately 30,000.

- Land Management – As the water level drops from elevation 1564 to 1554 feet m.s.l., approximately 26,205 additional acres of land area are exposed that were previously underwater during higher pool levels.

Opportunities

- There are no additional management opportunities provided at this lake elevation over what was listed previously.

Management Strategies

- There are no additional management strategies identified for this lake elevation.

(6) Low Pool Elevation Zone 6 - 1554 to 1540 feet m.s.l.

Issues

- Land Management – Within this zone, as the water level drops from

elevation 1564 to 1554 feet m.s.l., roughly 23,063 additional acres of land area are exposed that were previously underwater during higher pool levels.

Opportunities

- There are no additional management opportunities provided at this lake elevation over what was listed previously.

Management Strategies

- There are no additional management strategies identified for this lake elevation.

MANAGEMENT STRATEGIES

This section outlines a list of general strategies designed to deal with the high and low pool issues identified in the management plan. Specific strategies for each pool zone were identified previously.

a. Reservoir Access.

(1) Ramps

- Identify areas where slope and water extent would allow extension of existing boat ramps.

- Identify access areas where topographic slope and low water conditions would allow for the installation of new permanent high and low water ramps.

(2) Marinas

- Identify areas where existing access roads could be extended and temporary marinas accommodated.

- Investigate the use of mobile docks that could be lowered or raised depending on water levels or for use of portable or seasonal docks that could be relocated.

b. Cultural Resources

- Identify areas of highest priority for cultural significance where erosion is likely to take place and install protective measures (i.e. riprap, vegetation) to prevent and deter vandalism.

- Enact temporary closure of sensitive cultural areas. Close areas with exposed cultural sites.

- Expand public education and outreach programs to teach people the significance of cultural resources and laws regarding the removal of objects from Federal land.

Promote use of a toll-free numbers (Currently 1-866-NO-SWIPE) for reporting suspecting looting, exposed human remains and other issues regarding cultural sites.

- Coordinate with State and Tribal partners to assist in the implementation of a "maintenance and monitoring" program based on elevation zones and highest priority resource areas.

c. Bank Erosion

- Prioritize bank erosion areas into (1) essential facilities and safety areas, (2) cultural sites, (3) secondary areas, and (4) tertiary areas. Identify critical and priority bank erosion areas such as roads, ramps, and docks or areas of particular safety concern such as unstable banks near recreation areas and create a primary stabilization program. Use riprap only in unstable and dangerous areas.

- Develop a budget and prioritized list of projects to be completed over the next five years. Include an emergency budget for unforeseen problems.

- Prioritize cultural sites in danger of erosion through processes identified under cultural resources section in the CRMP.

- Plant vegetation to assist in bank stabilization in areas of secondary importance. Identify areas with potential for fast growing plants and bioengineering (willow stakes or fascines).

- Allow erosion to take place in areas where impacts would be minimal.

d. Invasive Species

- Monitor and identify problem/concern areas and begin an aggressive spray program. Establish an annual spray schedule focusing on areas most likely to be exposed by projected reservoir levels.

- Replant areas with aggressive native grasses, sterile rye grasses, or other non-invasive cover crop.

- Communicate and coordinate with private landowners, State agricultural committees, the County Weed Board, and the Noxious Weed Task Force (founded in 2005) to control and eradicate invasive species.

- Investigate the practicality of enlisting students from local schools and colleges or friends groups to take part in species monitoring.

- Investigate the practicality of seasonal prescribed burns. Identify areas

where prescribed burning could be used safely and implement seasonal burn program.

- Investigate biological control methods. With the extensive increase in acreage threatened by invasive species within the low pool zones, chemical applications are no longer economical or practical.

e. Municipal Intakes

- Monitor reservoir elevations to detect any issues concerning the operation of municipal intakes on the project. If issues arise, be prepared to offer technical assistance concerning extending and/or armoring intakes to allow water intake to continue without interruption.

f. Threatened and Endangered Species

- Coordinate pool elevations with land management to avoid rises during the nesting season, if possible. The potential for impacting the nests should be considered.

- Inventory and identify endangered species habitat and monitor on a seasonal basis.

- Implement a multifaceted public education campaign using signage, flyers, background material, kiosks, and other sources to educate the public about endangered species and their habitat needs..

g. Irrigation Intakes

- Provide public outreach efforts to educate interested stakeholders on how to access daily reservoir elevations and provide contingency plans for emergency situations. This will allow irrigators who rely on the reservoir for water to adjust their operations as necessary.

h. Coldwater Fish Habitat

- Monitor the fishery for negative effects at extreme low water and coordinate with appropriate State and Federal fish agencies.

i. Land Management

- Identify areas of impacts where high or low pool issues occur and concentrate efforts in those areas first. Using historical data and current land use, develop plans that include, site data, budget strategies and list of affected stakeholders.

j. Safety and Health Hazards

- Provide public outreach effort to educate interested stakeholders on how to access daily reservoir elevations. This will inform landowners and recreation users of potential water level changes.

- Eliminate tag fence lines as the pool level rises in order to avoid recreational hazards. Tag fences that are left in place during pool rise events can quickly be inundated and pose an underwater hazard for boaters, swimmers, and anglers.

- Electrical equipment associated with temporary uses or pumps that follow the reservoir level down need to be removed or secured as reservoir levels increase.

k. Wildfire Hazards

- Identify highest risk areas for wildfire hazards and provide monitoring and advisories for recreation users and continue efforts to coordinate with Federal, State, Tribal, counties, and other local agencies.

l. Facility Maintenance

- Develop a facility maintenance plan based on the specific facilities and identified pool elevation zones.

RECOMMENDATIONS

This section provides general recommendations when dealing with either high or low pool elevations.

a. Communications - Many of the issues identified under high and low water conditions require a basic communication strategy because of the need to communicate status and/or risk to the public or specific target groups. The communication strategy is also necessary to inform Corps staff and other agency personnel so they can be prepared to implement the necessary management strategies. Many of the management strategies discussed later in this section require a series of actions in specific sequence and complex notifications and coordination among multiple agencies and the public. It is important to have a clear communication strategy in place for these to work. A clear strategy with lines of communication identified with specific triggers needs to be in place before any of the proposed management strategies will be effective.

b. Reservoir Access Ramps - A monitoring plan needs to be developed for determining when ramps or recreation areas are either (1) no longer functional because of a change in water level; or (2) have recently become functional because of a change in water level. Ramps that are either inundated during high water or emerge as the reservoir elevation drops will need to be cleaned, rehabilitated, and prepared for use as necessary. A monitoring plan should be in place based on projected reservoir elevations so that these closures and openings can be anticipated and executed with minimal disruption to recreational users.

The reservoir water levels affect Title VI recreation facilities. The Corps should coordinate with the other agencies responsible for ramp management and maintenance, specifically SDGFP, to communicate current reservoir water levels and elevation forecasts. Discussions should also take

place regarding public demand and/or impacts outside recreations areas and provide technical assistance where appropriate.

c. Cultural and Historic Resources - The Corps has implemented several methods to prevent destruction of cultural resources during high and low water conditions. These include bank stabilization, surveys and excavation, monitoring, public education, patrols, and vegetative ground cover.

The Corps has worked with the tribes to develop the CRMP. Work should continue with both CRST and SRST to implement a "maintenance and monitoring" program based on elevation zones and highest priority resource areas. In cooperation with the tribes, a list of sites to be stabilized during times of low water should be developed. Communicate and work with the tribes on preventing additional impacts.

d. Bank Erosion - Identify and prioritize bank erosion areas that affect essential facilities and public safety. Prioritize or rank the critical bank erosion sites that impact areas such as roads, ramps, and docks or areas of particular safety concern such as unstable banks near recreation areas. Create and fund a stabilization program to address these sites. Use riprap only when bioengineering methods are inappropriate.

Consider developing a budget and list of projects and prepare a schedule for projects to be completed over the next five years. This will be dependent on water levels. Water could rise and stay high enough that projects cannot be completed. Include an emergency budget for unforeseen problems.

e. Land Management - The Corps should coordinate with local jurisdictions and interest groups and leverage their assistance for land management issues when and where feasible. Management effort and labor effort should be coordinated with the Federal. State, Tribal agencies, and other stakeholders.

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CHAPTER 4
PUBLIC INVOLVEMENT AND COORDINATION

In 1992, the Corps began the process of updating the Lake Oahe Master Plan, which was last approved in 1962. In addition to project visits by key members of the study team, preliminary meetings were held with those State and local governmental officials that have direct involvement in the management of the resources of Lake Oahe. These meetings were held in November of 1992.

A series of scoping meetings was held between April 1993 and June 1994 in Bismarck, Linton, and Fort Yates, North Dakota; and McLaughlin, Mobridge, Gettysburg, Eagle Butte and Pierre, South Dakota. Scoping meetings were held as informal workshops in order to afford guests adequate time to discuss issues with Corps representatives. The purpose of these meetings was to seek public input regarding (1) the long-range goals for the Oahe Dam/Lake Oahe project and (2) the management and development of project lands and water. Area residents expressed their concerns about management of Lake Oahe resources and future development on the lake.

The Oahe Master Plan update was put on hold during the implementation of Title VI so the new master plan could reflect the changes in land ownership that were made under Title VI.

Revision of the Oahe Master Plan began in earnest in September 2007. Coordination meetings with Federal and State agencies as well as the Tribes affected by the Programmatic Agreement (signed in 2004) were held in Pierre and Eagle Butte, South Dakota; and Fort Yates and Bismarck, North Dakota. These meetings were held to obtain more specific information germane to the developments at the Oahe project, the effects of these developments on the Cheyenne River and Standing Rock Sioux Tribes; and necessary revisions of the Master Plan as a result of Title VI. After the development of the Draft Master Plan the comment period was open from July 13 through August 21, 2009. Public meetings were held to solicit additional public interest for the development of new and or improved recreation facilities and measures for natural and cultural resources protection. These meetings were held in Bismarck, Linton and Fort Yates, ND; and Eagle Butte, Mobridge and Pierre, SD August 9-15, 2009.

After corrections/comments were added to the draft master plan, a pre-decisional document (Preliminary Final Oahe Dam/Lake Oahe Master Plan) was sent to agency and tribal partners for any remaining comments. The comment period for the final review was February 8 through March 12, 2010.

A summary of comments received and the Corps responses can be found in Appendix D. A copy of the approved Oahe Master Plan can be found at: (https://www.nwo.usace.army.mil/masterplans/)

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CHAPTER 5
LAND ALLOCATION, LAND CLASSIFICATIONS, AND RESOURCE OBJECTIVES

This chapter presents the land use plan for the Oahe Dam/Lake Oahe project area. In the plan, specific parcels of land are zoned into land use categories based on resource capability. Combined with the project-wide and site-specific resource objectives presented in this chapter and chapter 6, respectively, the land use plan provides a conceptual guide for the use, management, and development of all project lands. Together, these elements are the heart of this Master Plan.

The Oahe project is divided into management units. Division of the project into individual units was an integral part of the planning processes and facilitated identification of the most appropriate land and resource uses of the various project areas. The boundaries of the management units are based on physical, administrative, and/or operational characteristics.

LAND ALLOCATION

Land allocations identify the authorized purposes for which project lands were acquired. The entire Oahe project has a land allocation of Project Operations. Project Operations lands are those lands acquired to provide safe, efficient operation of the project for its authorized purposes. These project purposes include flood control, hydropower, navigation, irrigation, municipal and industrial water supply, fish and wildlife conservation, recreation and water quality. Separable lands were not acquired for purposes of recreation, fish and wildlife conservation, or mitigation.

LAND CLASSIFICATIONS

All lands acquired for project purposes are classified to provide for development and resource management consistent with authorized project purposes and other Federal laws. The classification process refines the land allocations to fully use project lands and considers public desires, legislative authority, regional and project-specific resource requirements, and suitability. Agricultural or grazing use of project land is not a land classification; however, it may be an interim use to meet management objectives. Management and use of the lands assigned to each land classification are discussed in connection with the appropriate resource objectives in the following section. The land classifications are described below, and their locations are shown on plates 1 through 23.

RESOURCE OBJECTIVES FOR SPECIFIC LAND CLASSIFICATIONS

Resource objectives are attainable goals for resource development and/or management which are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and expressed public desires. These objectives provide a consolidation of the information presented in the previous chapters of this Master Plan. The resource objectives will be met, either wholly or partially, through the implementation of the site-specific resource objectives established for each management area described in Chapter 6. The resource objectives that were developed for each land classification at the Oahe project and the rationale used to develop the objectives are provided below.

PROJECT OPERATIONS LANDS

This classification includes lands required for the dam and associated structures, operations center, administrative offices, maintenance compounds, and other areas that are used to operate and maintain the Oahe Dam/Lake Oahe project. Where compatible with operational requirements, Project Operations lands may be used for wildlife habitat management, recreational use, or agricultural activities. Licenses, permits, easements, or other outgrants are issued only for those uses that do not conflict with operational requirements. Approximately 6,500 acres of land are classified as Project Operations.

a. Resource Objectives. Resource objectives for Project Operations lands include the following:

- Maintain and operate project structures in a manner that allows them to effectively fulfill project purposes
- Provide for public use of project structures where such use is feasible and does not interfere with other project purposes
- Provide an adequate area for maintenance facilities that are required to meet overall project objectives.

b. Rationale. The Oahe project is a component of the Missouri River mainstem system of dams that are operated for flood control, navigation, hydropower, fish and wildlife, recreation, municipal and industrial water supply, water quality, and irrigation.

Most of the major Project Operations lands at the Oahe project are clustered at the southern end of the reservoir. The operation and maintenance of the Oahe Dam is the primary purpose of these lands. Uses that interfere with operational activities, compromise the structural integrity of the project or its facilities, or create a safety hazard for visitors or project personnel cannot be allowed. Within these constraints, Project Operations lands provide important opportunities for visitor use, interpretation, and wildlife management.

Reservoir operation is outside the scope of the Master Plan. However, operation of the lake in accordance with its authorized purposes forms the basis for many of the project-wide and management area resource objectives and the management and development concepts that are presented. Future changes to the reservoir plan of operation may negatively impact some project purposes or objectives while benefiting others.

RECREATION LANDS

These lands are designated for intensive levels of recreational use to accommodate and support the recreational needs and desires of project visitors. They include lands on which existing or planned major recreational facilities are located and allow for developed public recreation facilities, concession development, and high-density or high-impact recreational use. Nearly 2,200 acres of land at the Oahe project are classified as Recreation.

In general, no uses of these lands are allowed that would interfere with public enjoyment of recreation opportunities. Low-density recreation and wildlife management activities compatible with intensive recreation use are acceptable, especially on an interim basis. No agricultural uses are permitted on those lands except on an interim basis for maintenance of scenic or open space values. Permits, licenses, and easements are not issued for non-compatible manmade intrusions such as pipelines, overhead transmission lines, and non-project roads, except where warranted by the public interest.

a. Resource Objectives. Resource objectives for Recreation Lands include providing for camping opportunities, separate day use opportunities, opportunities for several activities in the same general vicinity, lake access for boats, concessionaire marina facilities and services, opportunities for the elderly and handicapped to participate in a variety of activities, and trees for shade and for wildlife use, as well as to control shoreline and soil erosion.

b. Rationale. The location and design of recreation areas and facilities takes into account the desired recreation experience. Criteria such as spacing, buffer zones, vegetative screening, and other considerations are used in the design of recreation facilities to ensure that visitors have adequate access to the lake and quality recreational experiences.

A basic objective of the Corps' master planning process is to provide the best possible combination of resource uses and management options to meet the needs of the public. In part, this is accomplished by emphasizing the particular qualities, characteristics, and potentials of a given area or group of areas within the project. For example, the Downstream Recreation Area is easily accessible from State Highways 1804 and 1806, has easy access to Lake Oahe as well as Lake Sharpe, and accommodates all kinds of motorized and non-motorized boating activities. This area also has developed campgrounds and day use areas. In contrast, while the Beaver Creek Recreation Area also has a day use area and campgrounds, it lends itself to other types of resource-oriented recreational experiences since it is remotely located.

MITIGATION LANDS

This classification includes those lands specifically designated to offset habitat losses associated with the development of the Oahe project. No lands are currently classified as mitigation lands at the Oahe project.

a. Rationale. Design Memorandum M (Gen)19, approved by the Missouri River Division in December 1987, details implementation plans for the Lake Oahe wildlife mitigation. The plan identified habitat areas within the Oahe project that should be managed for wildlife mitigation. These lands were prioritized into two categories. Category I project lands had good potential for habitat improvement and relatively good road access. These lands also include some areas that are already managed as wildlife areas. The remainder of available project land, exclusive of lands managed as natural areas, are designated as Category II project lands. These lands had moderate to poor potential for habitat improvements and little or no road access. With the implementation of Title VI and the transfer of these lands to SDGFP, the Corps mitigation responsibilities as identified in M(Gen)19 have been satisfied.

ENVIRONMENTALLY SENSITIVE AREAS

This classification consists of areas where scientific, ecological, cultural, or aesthetic features have been identified. Development of public use areas on lands within this classification is normally limited or prohibited to ensure that the sensitive areas are not adversely impacted. Agricultural or grazing uses are not permitted on lands with this classification. Approximately 1,750 acres of Oahe project land are classified as Environmentally Sensitive.

a. Resource Objectives. Resource objectives for Environmentally Sensitive lands include the following:

- Protect and preserve scientific, ecological, cultural, or aesthetic resource sites while meeting other project resource objectives;
- Ensure that no degradation or net loss of wetland areas occur;
- Preserve and/or restore wildlife habitat; and
- Provide a resource-oriented recreation opportunity in as natural an environment as possible.

b. Rationale. Several areas around Lake Oahe have been designated as environmentally sensitive areas. These areas have been designated in order to preserve and protect their natural resource values, scenic values, historic values, fish and wildlife habitat, and/or other special qualities. Although these areas are available for limited public use, many possess natural features that are managed for research and education purposes with minimal human intervention and impacts. Preservation, protection, and conservation are the primary management goals in these areas. In these areas restoration of wildlife habitat must be to a level appropriate to the resource being protected and will be determined on a case by case basis.

MULTIPLE RESOURCE MANAGEMENT LANDS

This classification, which contains over 87,000 acres, includes lands managed for one or more of the following activities.

- Recreation-Low Density. These lands are designated for dispersed and/or low-impact recreation use. Approximately 1,840 acres of Oahe project lands are included in this sub-classification. Development of facilities on these lands is limited. Emphasis is on providing opportunities for non-motorized activities such as walking, fishing, hunting, or nature study. Site-specific, low-impact activities such as primitive camping and picnicking may be allowed. Some limited facilities are permitted, including boat ramps, trails, parking areas and vehicle controls, vault toilets, picnic tables, and fire rings.

Manmade intrusions, including power lines, non-project roads, and water and sewer pipelines, may be permitted under conditions that minimize adverse effects on the natural environment. Vegetation management, including agricultural activities that do not greatly alter the natural character of the environment, are permitted for a variety of purposes, including erosion control, retention and improvement of scenic qualities, and wildlife management. Where not in conflict with the safety of visitors and project personnel, hunting and fishing are allowed pursuant to State and/or Tribal fish and wildlife management regulations.

- Wildlife Management. These lands are designated for wildlife management, although all project lands are managed for fish and wildlife habitat in conjunction with other land uses. Wildlife management lands contain valuable wildlife habitat components that are maintained to yield habitat suitable for a designated wildlife species or group of species. Approximately 85,400 acres of Oahe project lands are included in this sub-classification.

These lands may be administered by other public agencies under a lease, license, permit, or other formal agreement. Licenses, permits, and easements are not allowed for such manmade intrusions as pumping plants, pipelines, cables, transmission lines, or non-project roads. Exceptions to this policy are allowable where necessary for the public interest. Wildlife lands are available for sightseeing, wildlife viewing, nature study, and hiking. Consumptive uses of wildlife, including hunting, fishing, and trapping, are allowed when compatible with the wildlife objectives for a given area and with Federal and State fish and wildlife management regulations. As stated earlier, agricultural or grazing use of project land is not a land classification; however, it may be used to meet management objectives of the wildlife or vegetation management programs.

- Vegetative Management. Management activities in these areas focus on the protection and development of forest resources and vegetative cover. The Oahe Dam/Lake Oahe project has no

project lands with this sub-classification, but all project lands are managed to protect and develop vegetative cover in conjunction with other land uses.

- Inactive and/or Future Recreation Areas. This sub-classification consists of lands for which recreation areas are planned for the future or lands that contain existing recreation areas that have been temporarily closed. The Oahe Dam/Lake Oahe project has approximately 370 acres with this sub-classification. Although development of these areas will not be done by the Corps, they are suitable for development by State or Tribal entities.

- Easement Lands. This classification consists of lands for which the Corps did not acquire fee title but did acquire (1) the right to enter onto the property in connection with the operation of the Oahe project and (2) the right to occasionally flood the property. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement acquired for the project. There are roughly 1,895 acres under easement.

a. Resource Objectives. Resource objectives for Multiple Resource Management lands include the following:

- Provide trail opportunities for interpretive hiking;
- Accommodate and support non-consumptive resource uses such as hiking, bird watching, photography, nature study, wildlife observation, and/or the pursuit of peace and solitude;
- Employ good stewardship practices by increasing the use of soil conservation measures;
- Ensure successful natural propagation of diverse fish and wildlife species; and
- Provide sites for future development that are adjacent to existing recreation areas and within the project boundary and that meet anticipated outdoor-recreation demands. These sites must be appropriate for that area of the project and must not adversely impact project operations or other project purposes.

b. Rationale. In addition to the intensively developed recreation areas, less developed recreation areas are available for a wide variety of low-density, dispersed recreation uses. Boating, fishing, hunting, hiking, and other such uses support and complement this objective.

The project area provides many opportunities for a variety of dispersed recreation activities. Given the excellent walleye and northern pike fishing at Lake Oahe, fishing pressure is expected to increase. The project area contains a diversity of habitat types and wildlife species, including waterfowl, upland game birds, and big game species, so hunting is a major activity. The same diversity of habitats and wildlife make the Oahe project an excellent location for wildlife viewing and photography.

CHAPTER 6
RESOURCE PLAN

INTRODUCTION

A wide variety of factors must be considered when developing Oahe project lands and resources. These factors include physical characteristics, land and lake access, compatibility with adjacent land uses, existing and projected visitation levels and visitor-use pattern, the economics of operation and maintenance, and Federal, State and local initiatives. It is vital that any future recreational development not destroy the very features of the Oahe project that visitors come to enjoy. Therefore, the overall objective in development at the Oahe project is to maximize the recreational benefits while preserving the area's natural resources and scenic qualities.

The purpose of the Master Plan is to provide a long-range view of project development. As such, it is important to (1) examine the various segments of the lake and their potential for development and (2) examine each management area within the various segments and determine how each area can be developed to fit with the overall goals of the segments and the Oahe project as a whole.

OAHE PROJECT

Lake Oahe can be divided into three segments. The lower portion of the lake from Oahe Dam north to just south of Mobridge, South Dakota can be defined as having true lake qualities. This segment has deep standing water with little flow except as generated from powerhouse and spillway releases. Lake Oahe becomes more river-like in appearance and has bottomland riparian areas north of the South Dakota/North Dakota state line. This portion has moving water with numerous snags and exposed sandbars. The area in between these two segments exhibits qualities of both a lake and a river. This "transition" area is deep in some areas but still has areas of exposed sandbar. Portions of this area may have riparian areas while other areas are nearly barren. It is important to recall these three distinct areas when considering potential development. It is also important to incorporate the qualities of each of these areas when looking at the Oahe project as a whole.

Because of the expanse of the Oahe project, it was important that each of these three segments have adequate recreation facilities of all types - from highly developed recreation areas to very primitive areas. Indeed, the development of the major recreation areas of Downstream Recreation Area (at Pierre), Indian Memorial Recreation Area (at Mobridge), and General Sibley Park (in Bismarck) accounted for approximately 57.5 percent of the total project visitation in 2000. Other recreation areas, primitive areas, and lake access areas are scattered throughout the project. There are a total of 58 recreation areas along Lake Oahe the management of which varies with each area.

As a result of Title VI, some recreation areas formerly owned and managed by the Corps have been turned over for ownership to South Dakota. These recreation areas are listed on Appendix A. It is now the responsibility of SDGFP to administer and provide services on these lands. However, the Corps still retains ownership of those portions of the lands and water areas below elevation 1607.5 m.s.l. During low pool elevation, the exposed lands will be managed by the Corps to support the adjacent recreation use.

Many of the visitors to the Oahe project reside east of the lake although significant numbers of visitors come from the Rapid City, South Dakota area. It appears that the number of recreation areas is adequate on the east side of Lake Oahe, although some of the facilities at these areas need to be improved. The west side of the lake has comparatively few recreation areas. It is difficult to access much of the western shoreline because of steep slopes, drop-offs, and rugged terrain. Several areas located on the west side of Lake Oahe are suitable for the development of additional small recreation areas by outside agencies. Although there are west-side recreation areas in the northern portion of the lake, development near the tributary confluences of the Cannonball, Moreau, and Cheyenne Rivers as well as Four-Mile Creek and South Dakota Highway 212 should be explored. These additional recreation areas would further enhance the Oahe project by making more of the western shoreline accessible to recreationists. At this time there area are not slated for development by the Corps because of budgetary constraints. However, they are available for lease and development by others often completing the required support documents.

Because of the expanse of Lake Oahe, boating is a very important means of transportation on the lake. As such, it is necessary to have the facilities to support this activity. Marinas of all types have a place on Lake Oahe. These marinas range from full service types with a convenience store, restaurant, on-water fuel, dry storage, repair shop, and pump-out facilities to small marinas of just a few slips and no on-water facilities.

The greatest need for full service marina facilities is in the lower and transitional areas of the lake. These areas have the deepest water as well as the highest visitation. Full service marinas should be considered in the areas around and/or within ten miles of Oahe Dam, South Dakota Highway 212 Bridge, and Mobridge. All of these areas have access from both sides of the lake.

There are other areas on Lake Oahe that do not have the population base to support full-service marinas but would fill a demand for smaller facilities. These marinas may include on-water fuel, a small convenience store, a small restaurant, and pump-out facilities but no long-term dry storage or repair facilities. Areas near Beaver Creek, Walker Bottom, and Fort Yates, North Dakota would be well suited for this type of development.

Because of the size of Lake Oahe, there is still a need for small marinas with no permanent docking facilities and no on-water facilities. These marinas would support fishing parties that intend to stay approximately one week or less in a given area. Such facilities would be advantageous in the areas around the South Dakota/North Dakota State line and Hazelton.

Lands managed for wildlife are located throughout the Oahe project. Wildlife lands are available for sightseeing, wildlife viewing, nature study, and hiking. Consumptive uses of wildlife, including hunting, fishing, and trapping, are allowed when compatible with the wildlife objectives for a given area and with Federal and State fish and wildlife management regulations.

In the southern portion of the project, many of the wildlife lands were transferred to the State of South Dakota under Title VI. As a result, the remaining Corps lands may be narrow strips of land or just cut banks. Management of these lands will be consistent with the management prior to the land transfer. In most cases, this will mirror the management on the adjacent State-owned lands.

As of this writing, the Corps has signed a real estate instrument to grant structures in appropriate recreation areas below elevation 1607.5 m.s.l. to the South Dakota Department of Game, Fish, and Parks (Easement # DACW 45-2-08-6013). This document grants an easement over, across, in, and upon Corps lands for recreational and other purposes including the construction, operations, maintenance and repair of water intake structures, publicly owned boat docks, publicly owned boat ramps. And related publicly owned structures.

In accordance with NWDR 1110-2-5; Land Development Guidance at Corps Reservoir Projects (LUDP), the Corps is required to evaluate and document land development proposals for Oahe Reservoir. The proposals must comply with appendix A and B of the LUDP and be measured against the following criteria:

- To provide guidance on projects proposed to be constructed within the Corps reservoirs for which one authorized purposed of the reservoir is flood control. Two primary activities that this guidance addresses are cut and fill volumes for land development and acceptable land use development within the reservoir area.

- In order to conserve the area-capacity of Lake Oahe, any proposed development located within the reservoir pool which requires fill material being brought to the development site will require further review. The amount of flood storage in the reservoir must not be adversely affected by the fill material. If soil is brought in for a project, an equal amount of cut volume must be removed at the same elevation, or lower, but above the conservation pool. The cut and fill operations must not cause any property or existing structures to be flooded more frequently than before the proposed development was in place and there must be no net loss in flood storage.
- All proposed development within the reservoir will be evaluated to determine the impacts on human safety, potential damages, and preservation of the beneficial properties served by flood plains. Lake Oahe is divided into the five zones shown below based on the frequency of flooding. Each of these zones has development constraints and acceptable land uses which are specifically addressed within Appendix B of NWDR 1110-2-5 and must be complied with when considering development.

Zone 1. Elevation less than 1618.1 feet above mean sea level
Zone 2. Elevation 1618.1 to 1619.5 feet above mean sea level
Zone 3. Elevation 1619.5 to 1620.0 feet above mean sea level
Zone 4. Elevation 1620.0 to 1640.3 feet above mean sea level
Zone 5. Elevation 1640.3 to 1644.4 feet above mean sea level

The LUDP is the formal tool in which all proposals for development, whether for site development which could require cut and fill calculations, or for the construction of recreational facilities, administrative offices, or vendor operated structures, must be compared to. Early consideration of these requirements in the planning process could effectively reduce overall time and cost requirements for each proposed development.

MANAGEMENT UNITS

This chapter identifies the management units and resource objectives that were established for each of those units that make up the Oahe Dam/Lake Oahe project. The locations of the areas are shown on plates 1 through 26. The management area resource objectives reflect site-specific application of the project-wide resource objectives established in the previous chapter. Implementation of these objectives will help to satisfy identified regional needs and desires of other agencies and the public within the limits and capabilities of the project resource base.

The discussion of each Corps-owned management unit contains the following components.

- Management Unit (MU) number - This is a sequential number assigned to each management unit all around the Oahe project lands beginning with the dam as MU #1, continuing up the east side of the reservoir and back down on the west side ending with the Downstream Recreation Area as MU #110

- Classification - The designated land use classification category for each recreation area. The five classification categories are described in detail in chapter 5.

- Management Agency - The agency directly responsible for the management of a particular area. Under the Title VI land transfer, mandated by the 1999 WRDA (P.L. 106-53) as amended by the 2000 WRDA (P.L. 106-541), the Corps (on Oahe project lands) was required to 1) transfer in fee title certain lands (outside the boundaries of Indian reservations) above elevation 1620 feet m.s.l., the top of the exclusive flood control pool, to the State of South Dakota to be managed by the SDGFP; 2) transfer in fee title lands within the boundaries of the CRST Indian Reservation that are above elevation 1620 m.s.l. to the DOI to be managed in trust for the tribe; 3) transfer all Corps recreation areas in South Dakota above elevation 1607.5 feet m.s.l. to SDGFP and above 1620 feet m.s.l. to DOI for CRST; and 4) establish a trust fund to pay for wildlife

restoration work, cultural resources preservation, and management of transferred lands. Although the land above elevation 1620 m.s.l. was transferred to the SDGFP under Title VI, the Corps will continue to have jurisdiction over the transferred land in regard to the three Federal cultural resource laws (National Historic Preservation Act, Archaeological Resources Protection Act, and Native American Graves Protection and Repatriation Act). With the exception of the recreation lands mentioned above, the lands below 1620 feet m.s.l. are retained as operational lands because of normal operating pool fluctuations. The management of these lands will mirror the adjacent land classification in order to coordinate with the State and Tribal management of the their areas

- Location - A brief description of the location of the area, including access to the area. The MU boundaries with the State of South Dakota have been aligned with the adjacent SDGF&P units for consistency and future coordination.

- Description - A brief description of the area, focusing on the natural and cultural resources that affect use of the area. The acreage figures assume a baseline of elevation 1607.4 m.s.l. Cultural resources information is from the 2004 Oahe Cultural Resources Management Plan (CRMP) (USACE 2004). All nearby islands are included in the listed acreage figures for each area.

- Area Use/Visitor Use - The predominant use of the area or the predominant use of the area and where the majority of the visitation originates.

- Resource Objectives - A brief list of the objectives for each management unit. Each unit has more than one resource objective, and these objectives are not prioritized. In some areas, the resource objectives may not be implemented for some time.

- Development Needs - Summary descriptions of the techniques that can or should be undertaken to implement the area resource objectives. The concepts discussed under this component are not all-inclusive; rather, they convey an understanding of the range of development and management strategies that could be used to implement the resource objectives. The development needs will be further refined and detailed in subsequent planning and design documents, including Operational Management Plans (OMPs) and future Design Memorandums (DMs). The ultimate decisions regarding the methods that are actually implemented will result from coordination between the Corps, State, Tribal, and local agencies, and the private sector, where appropriate and as opportunities arise.

- Rationale - A discussion of the need for and the intent of the identified ROs and the development concepts recommended to implement them.

- Special Site Conditions - This optional component is used when there are very specific issues that apply to the MU that may affect the overall management outcome of the unit.

The recreation areas within the State of South Dakota (excluding those within the Cheyenne River and Standing Rock Sioux Reservations) that are now owned by the State will not be addressed in this master plan. As indicated in earlier chapters, those recreation areas are listed in Appendix A.

An environmental assessment (EA) addressing the impacts of the implementation of the Master Plan has been included as Appendix C.

DAM EMBANKMENT, POWERHOUSE, ADMINISTRATION BUILDING ,MAINTENANCE YARD, OAHE CHAPEL, OVERLOOKS, AND VISITOR CENTER

Management Unit. MU # 001

Classification. Project Operations

Management Agency. Corps of Engineers

Under the provisions of Title VI, the Corps retains fee title to lands and structures necessary for the operation of the Oahe dam and related flood control and hydropower structures, including land below elevation 1620 feet m.s.l. Within this management unit, the Corps is retaining ownership and management of the land both above elevation 1620 feet m.s.l. and below elevation 1620 feet m.s.l. to the water's edge because the entire unit is necessary for project operations

Location. Oahe Dam is located at mile 1072 of the Missouri River, six miles north of Pierre, South Dakota. The Hughes and Stanley county line splits the dam embankment between the powerhouse and spillway. This management unit includes all of the project structures around the dam except for the spillway and extends north of the dam and west of SD Highway 1804 to the East Shore Recreation Area. Access to the area from the east is from SD Highway 1804. A paved highway along the top of the dam connects Highway 1804 with 1806. A small access road leading from SD Highway 1806 connects to the administration building, power plant, and maintenance yard.

Description. This area covers approximately 1,612 acres. The embankment creates a bridge between SD Highway 1804 and 1806 and is one of only four highway access points connecting both sides of the lake. The powerhouse is located on the eastern end of the embankment and the outlet works is on the western end of the embankment. The administrative building, power plant, and maintenance areas are located south of the dam.

The rolled earth dam embankment is approximately 9,300 feet long excluding the emergency spillway. Its height of 245 feet makes it second in height only to Fort Peck Dam of the Missouri River mainstem dams. Oahe Dam uses a bluff-to-bluff design similar to the other mainstem dams with the exception of Big Bend Dam.

Located on the west bank of the river, the outlet works consist of an approach channel, six concrete-lined tunnels, control shafts, stilling basin, and an exit channel.

The powerhouse is located at the east end of the embankment. It houses seven generating units currently rated at 112,300 kilowatts each for a total installed capacity of 786,000 kilowatts--the largest in the mainstem system. Within the powerhouse is a small visitor center. Numerous displays provide opportunities to learn about the purpose and operation of the dam, Oahe dam construction history, and how electricity is made. . Many school children as well as visitors to the Oahe project tour the powerhouse each year.

The intake structure is located at the east end of Oahe Dam. A visitor center and the historic Oahe Chapel are located immediately northeast of the dam. The Visitor Center has several displays depicting the construction of the dam and the natural resources of the area. Oahe Chapel was the worship and educational center for the Oahe Mission that was located at Peoria Flats about five miles up river from its present location. The chapel was moved to the face of the dam before the site was covered with water. There are two scenic overlooks located just north of the chapel. These are furnished with picnic shelters and tables and are accessed off SD Highway 1804.

There are some major cutbanks located in the northern portion of this MU. Mid-Dakota Rural Water System has a water intake in this area. This unit contains an area that is a staging and storage area for outside maintenance supplies.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Visitation to the facilities offered at the dam embankment is low. However, many visitors pass through the area to reach other recreation areas. At the powerhouse, the lobby and observation balcony provide interpretive displays about the purpose and construction of the Oahe Dam and the Corps hydropower function on the Missouri River. Daily tours of the powerhouse are conducted throughout the summer recreation season when tourists, school groups, special interest groups, and local residents visit the dam. During the remainder of the year, tours are available by prior arrangement.

The area around the intakes is a good fishery because the turbulent water attracts many species of fish. The cool, deep water in the intake area makes this a good area for salmon fishing. Fishermen who are attracted by catches of walleye and trout also use the stilling basin.

Resource Objectives.

- Accomplish power generation, flood control, and maintenance of the project
- Maintain the operational integrity of the dam and related facilities
- Provide opportunities for visitors to the project to learn of the mission of the Corps of Engineers on the Missouri River and to learn of the process of hydropower generation
- Manage vegetation resources in a manner best suited to the operational needs of the area
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Strive to minimize any potential environmental impact from the operation of the dam and structures

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Upgrade displays at the lobby of the administration building and improve exterior displays at the visitor center, overlook, and administration building
- Provide parking areas for shoreline users in the northern portion of this MU.
- Develop a trail for walking and biking

Rationale. This area is classified as Project Operations because the facilities located here are essential for the operation and maintenance of the Oahe Dam/Lake Oahe project. Operation of the project and concerns for safety are the primary aspects of management of this area. However, compatible public use also is supported.

EAST SHORE AREA

Management Unit. MU #002

Classification. Project Operations

Management Agency. Corps of Engineers
Under the provisions of Title VI, the Corps retains fee title to lands and structures necessary for the operation of the Oahe dam and related flood control and hydropower structures, including land below elevation 1620 feet m.s.l.

Location. This area is located east of SD Highway 1804 north of the dam and west of SD Highway 1804 south of Oahe Dam in Hughes County, South Dakota. Its boundaries are opposite the East Shore Boat Ramp on the north and the southern project boundary. The East Tailrace fishing area is not included in this management area. Access to this area is from a gravel road off of SD Highway 1804.

Description. The topography of this 996-acre area ranges from steep, highly dissected terrain in the south to nearly level lands that have been cultivated for crops in the north. Established shelterbelts are numerous with many types of deciduous trees and shrubs. In the north, shelterbelts contain extensive plantings of green ash, Siberian elm, eastern red cedar, and Russian olive. Chokecherry, lilac, caragana, honey locust, plum, honeysuckle, buffaloberry, and Nanking cherry are the primary understory vegetation. The steep wooded draws in the southern portion of the area are characterized by green ash and chokecherry.

This area is used extensively by a variety of wildlife. A number of hawks and songbirds nest in the shelterbelts. Upland game species such as pheasant, sharp-tailed grouse, and prairie chicken are common. Mule deer and white-tailed deer are occasional inhabitants. The area is frequented by both bald and golden eagles during waterfowl migration.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The area is currently managed to upgrade the habitat for upland game species. Plantings of green ash, Siberian elm, and Russian olive have helped to replace habitat destroyed at the time of the reservoir filling. These plantings have increased the amount of available winter cover and dense nesting cover.

The land use adjacent to this wildlife area is agricultural in nature, primarily small grain and some row crops. The numbers of upland game birds residing in the area attract hunters during the fall

season. Nonconsumptive wildlife uses of this area include hiking, photography, bird watching, and nature study.

Resource Objectives.

- Upgrade and maintain the quality of habitat for a variety of wildlife species
- Provide for nonconsumptive resource uses such as hiking, photography, and sightseeing
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Maintain the area for security and emergency operations of the dam structures

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of wildlife and fisheries
- Develop food plots at lower elevations to supplement native food sources for waterfowl, migrant bird species, big game, and upland game species

Rationale. A land use classification of Operations because if provides utility corridors, security vantage points, and emergency construction areas. This area also serves as valuable habitat for upland game species. The area is also suitable for additional wildlife plantings.

EAST SHORE RECREATION AREA

Management Unit. MU #003

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. South Dakota Department of Game, Fish, and Parks
Within this management unit, the Corps is retaining ownership of the land above elevation 1620 m.s.l. and below elevation 1620 feet m.s.l. to the water's edge. However, under the provision of Title VI, the entire unit is leased in perpetuity to the SDGFP. Under this provision, the Corps maintains fee ownership to lands necessary for project operations but may lease recreation associated with the dams. At this site, the left dam abutment is essential to the operation and maintenance of the project.

Location. The East Shore Recreation Area is located approximately seven miles north of Pierre in Hughes County, South Dakota. This management area is west of SD Highway 1804 and extends from the East Shore boat ramp around the bay to the back of the adjacent coves where the Corps fleet is stationed. Access to this area is from a paved road off of SD Highway 1804.

Description. The East Shore Recreation Area is located in an area of gently rolling breaks. The boat ramp is situated in a flat drainage area in the northern portion of the recreation area. The dominant vegetation in the area is western wheatgrass. Minimal woody vegetation (mainly snowberry and cedar) exists and is found primarily in some of the draws. Green ash, Siberian elm, eastern red cedar, and Russian olive tree plantings have been established in the area. Wildlife species in the area include pheasants and other upland game species as well as both white-tailed and mule deer.

Recreational facilities in the East Shore Recreation Area include a 3-lane boat ramp with docks, parking area, picnic tables, vault toilets, and security lights.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the East Shore Recreation Area is low. Most of the visitors to this recreation area are from the Pierre/Fort Pierre area.

Fishing for small-mouthed bass, northern pike, walleye, catfish, and salmon is the primary attraction. A significant amount of shoreline fishing also takes place. During the fall hunting season, the area receives considerable use from goose hunters and other waterfowl hunters.

Resource Objectives.

- Provide recreation opportunities for day use
- Provide lake access to Lake Oahe for boating, fishing, and hunting
- Maintain and manage the existing vegetation to provide habitat for upland game birds, waterfowl, and other wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Develop a comprehensive site plan to address development in the area
- Manage vegetation for optimum use of wildlife and fisheries

Rationale. This area is classified as Multiple Resource Management: Recreation - Low Density. The area does receive significant local use. The easily accessible shoreline makes it attractive for water-oriented recreational activities. The organized development of shoreline parking areas and other features would lessen the potential negative impact on wildlife habitat.

GOVERNMENT BAY AREA

Management Unit. MU #004

Classification. Project Operations

Management Agency. Corps of Engineers
Under the provisions of Title VI, the Corps retains fee title to lands and structures necessary for the operation of the Oahe dam and related flood control and hydropower structures, including land below elevation 1620 feet m.s.l.

Location. Located approximately 2.5 miles north of Oahe Dam, in Hughes County, South Dakota, this area is immediately adjacent to the East Shore Recreation Area boat ramp. Access is off SD Highway 1804.

Description. The vegetation on this 25-acre area consists primarily of western wheatgrass. Wildlife can be found in the area, especially the western side of the embayment. White-tailed deer and some mule deer along with pheasant and prairie chicken are often seen.

The CRMP has not identified cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Government Bay Area contains the boat harbor where the Corps' workboat and barge are stored. Various materials such as stone riprap, culverts, and cattle guards are also stored here. A stock dam to control sediment and provide water for wildlife is located north of the harbor.

Resource Objective.

- Provide support for dam safety vessels and equipment used in the operation of the Oahe project
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

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Development Needs.

- Plant trees and shrubs between this area and the East Shore Recreation Area as a screening buffer
- Facilitate safety requirements for the dam
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Maintain stock pond above the dockage area for wildlife use and to reduce sediment filling the basin

Rationale. The Government Bay Area is appropriately classified for Project Operations. This area is used to store materials and equipment required for the operation and maintenance of the Oahe project.

BROCKHOUSE AREA

Management Unit. MU #005

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area is located in Hughes County, South Dakota, between the Government Bay Area and the Peoria Flats Game Management Area. Access to this area is by 2 miles of gravel road from SD Highway 1804.

Description. The 61-acre Corps area and the adjacent State-owned lands has a topography that varies from gently rolling on the west to rough terrain with moderate ravines on the east. Vegetation consists of native mixed grasses. Green ash/chokecherry and bur oak/chokecherry associations are found in the draws. Some cottonwood growth is occurring along the shoreline. Migrating flocks of geese and other waterfowl use the embayment in the spring and fall.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of this area.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species and waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources..
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for nesting habitat
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it and the adjacent State area serve as valuable habitat for upland and big game species as well as waterfowl.

PEORIA FLATS GAME MANAGEMENT AREA

Management Unit. MU #006

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Peoria Flats Game Management Area (GMA) is located on either side of the Peoria Flats Recreation Area on the east side of Lake Oahe in Hughes County, South Dakota. It is approximately eight miles northwest of Oahe Dam. Access to this area is by trails leading from a gravel access road into the Peoria Flats Recreation Area.

Description. The Peoria Flats GMA covers approximately 35 acres. This Corps area and the adjacent State owned lands are characterized by steep breaks and shale exposed banks. A limited amount of woody vegetation is present in the draws. Primary species include chokecherry, plum, and skunkbush. Green ash and Russian olive occur in small isolated stands. Cottonwood and willow are found in scattered stands along the shoreline.

Adjacent to this management unit is the State-designated Peoria Flats State Waterfowl Refuge. This waterfowl refuge is operated as a takeline refuge (a refuge whose boundary corresponds to the Corps project takeline). The refuge acts as a "no hunting" area that functions as a resting area for waterfowl.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. This makes the area popular for hunting, especially for pheasants and white-tailed deer. Irrigated cropland to the north of the area attracts a variety of wildlife species, primarily pheasants with occasional grouse and gray partridge.

Resource Objectives.

- Maintain the quality of habitat for big game and upland species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries
- Provide monitoring and protection of the cultural resources and threatened and endangered species from random access by OHV

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Peoria Flats GMA because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. The location of the Peoria Flats Waterfowl Refuge further supports this land use classification.

NYSTROM'S BAY AREA

Management Unit. MU #007

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 m.s.l.)

Location. This area is located in northern Hughes County, South Dakota. The Nystrom's Bay area extends from the west end of the Peoria Flats GMA to the Spring Creek bridge on SD Highway 1804. Access to this area is by a section line gravel road from SD Highway 1804.

Description. The 445-acre Corps area and the adjacent State owned lands is characterized by rough rolling hills with limited vegetation - primarily cool-season grasses.

The irrigated farmland adjacent to this area attracts both upland game and big game species. Upland game, primarily pheasant, makes good use of the native grasses for nesting cover. White-tailed deer are also plentiful. Sandhill cranes, whooping cranes, piping plovers, interior least terns, bald eagles, golden eagles, osprey, and hawks are known to use the area at various times of the year.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. This area and the adjacent State area receive considerable hunting and fishing pressure. White-tailed deer and pheasant are both popular takes. A shoreline use permit grandfathered boat docking facilities in Nystrom's Bay, approximately one mile south of Spring Creek Bay.

Resource Objectives.

- Maintain the quality of habitat for both upland and big game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Establish additional vegetation to protect the cultural resource sites present
- Control noxious weeds

- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

SPRING CREEK FISHERIES MANAGEMENT AREA

Management Unit. MU #008

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area is located in Hughes County, South Dakota, immediately east of the SD Highway 1804 bridge over Spring Creek. It is approximately 10 miles northwest of Pierre. Access to this area is from SD Highway 1804 onto gravel and unimproved trails.

Description. The 13-acre Corps area and the adjacent State-owned lands have a topography that is gently rolling, with the Spring Creek drainage running through the middle. Vegetation consists primarily of warm- and cool-season grasses. Natural woody vegetation is found only in the draws and along the Spring Creek drainage. This area is home to a variety of upland game such as pheasant and grouse. White-tailed and mule deer occasionally use the area.

For 11 years, the SDGFP operated a fisheries impoundment station east of the Spring Creek Bridge. This was operated to increase the number of northern pike in Lake Oahe. However, the impoundment dam leaked because of the gravel deposits in it. As such, most of the water has been drained and the area is managed primarily for wildlife. The dam has been removed and the area has reverted back to a creek.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

This general area receives considerable hunting pressure. Both white-tailed and mule deer, upland and small game, and waterfowl are highly sought after. The portion of Spring Creek at the SD Highway 1804 bridge is an excellent area for northern pike fishing in the spring and salmon fishing in the fall when the Lake Oahe water elevation is high enough to back water up to the bridge.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species and waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, protect, and monitor any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species, as well as waterfowl.

SPRING CREEK WILDLIFE AREA

Management Unit . MU #009

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This Hughes County, South Dakota, management area includes the north side of Spring Creek Bay, from the SD Highway 1804 bridge over Spring Creek to the Hughes County Lease area located within the Spring/Cow Creek Recreation Area. Access to this area is by a section line gravel road from Highway 1804.

Description. The 17-acre Corps area and the adjacent State owned lands has a topography of rolling hills with some steep breaks along the shoreline. There are some small draws with remnant woody vegetation. Cottonwoods and willows are found in scattered areas along the shoreline.

Wildlife using the area include both white-tailed and mule deer as well as small furbearers. During fall and spring migrations, geese and ducks may be found in the Spring Creek embayment. There is a limited amount of smelt spawning that occurs in Spring Creek.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

This area is widely used by fishermen for both Chinook salmon in the fall and northern pike in the spring. Hunting is also a popular activity in the fall. Deer, waterfowl, upland game, and small game species are taken in this area.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species and waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries

- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Spring Creek Wildlife Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe.

SHEEHAN AREA

Management Unit. MU #010

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area is located at the upper end of Cow Creek Bay in Sully County, South Dakota. The Sheehan Area extends from the eastern end of the Cow Creek Recreation Area around the bay to the eastern end of the Okobojo Point Recreation Area. Access is by way of a section-line trail and private land.

Description. The 154-acre Corps area and the adjacent State owned lands have a varied topography. Slight breaks and sandy beaches are found along the north side of Cow Creek Bay with lowland riparian areas at the head of Cow Creek. The major vegetation types are warm-season mixed grasses with cedars found in some draws. Cottonwood/willow associations are found scattered along the shoreline as well as in the lowland areas adjacent to Cow Creek.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Because of the variety of vegetation in this area, the Sheehan Area and the adjacent State area is heavily used by hunters. Upland game, big game, and waterfowl are taken in the fall. The availability of grain on the nearby irrigated farmland helps to draw these game species into the area.

Resource Objectives.

- Maintain the quality of habitat for upland species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries

- Provide all-weather vehicle road to the area with a small parking lot for access to the lake and hunting areas. The parking lot will be located at an elevation that is high enough that it is unlikely to be flooded.
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Sheehan Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. The organized development of an access road and parking area would lessen the negative impact on wildlife habitat caused by the random access into and through the area.

PLUM CREEK AREA

Management Unit. MU #011

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This Sully County, South Dakota area surrounds Okobojo Creek Bay and extends west to the Koenig Wildlife Management Area but excludes the Garrigan's Landing Area. Access to this management area is limited but it can be reached by boat.

Description. The topography of this 643-acre Corps area and the adjacent State area varies. It is characterized by gently rolling hills and rangeland on the east and steep rugged draws on the west. Vegetation is predominantly mixed warm-season grasses. Cottonwood and snowberry are found in the draws with some bur oak stands around Plum Creek. The shoreline in this area is susceptible to erosion.

Both white-tailed deer and mule deer can be found in the area year round. Upland game birds, primarily pheasants and grouse, also can be found in this management area. Sandhill cranes and whooping cranes are sometimes seen during spring and fall migrations. A variety of waterfowl can be found in the upper reaches of Okobojo Creek.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps owned Plum Creek Area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

There are two State-designated waterfowl refuges located within this management area. The first is the Okobojo Creek State Waterfowl Refuge located at the upper end of Okobojo Creek. The second waterfowl refuge is the Dry Creek State Waterfowl Refuge located off the western end of the area. . These "no hunting" takeline refuges includes all land and water within the Corps' takeline including all islands and sandbars. Both of these refuge areas are used as resting areas for migratory ducks and geese.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species and waterfowl

- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Plant additional trees and shrubs where feasible to increase woody vegetation and winter cover for wildlife
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species, as well as waterfowl.

KOENIG WILDLIFE AREA

Management Unit. MU #012

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This 2-mile long area runs from the western end of the Plum Creek Area to the southwest corner of Mail Shack Creek in Sully County, South Dakota. Access is by unimproved dirt trails.

Description. The topography of the 35 acres of the Corps Koenig Wildlife Area and the adjacent State area is moderately rugged with some steep west-facing slopes. Most of the area has highly erodible soil so numerous drainage ruts are evident. Vegetation consists primarily of warm-season mixed grasses with western wheatgrass predominating. Some cottonwoods have become established along the shoreline but little woody vegetation is present in the remainder of the area.

This area is inhabited by both white-tailed and mule deer. These yearlong residents rely on native vegetation and are attracted by adjacent grain fields. Waterfowl are numerous during the spring and fall migrations. Bald eagles are often seen in the area when the waterfowl are present.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Because this area is bordered on the north end by a waterfowl refuge and has another refuge relatively close to the southeast, this area also receives high use by waterfowl hunters. Some shoreline fishing does occur especially in the north near the mouth of Mail Shack Creek.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species
- Promote ecological integrity by controlling weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as transitional habitat for upland and big game as well as waterfowl.

MAIL SHACK CREEK AREA

Management Unit. MU #013

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area extends north from the Koenig Wildlife Area to the Little Bend Natural Area, excluding Pike Haven, in Sully County, South Dakota. Access is by boat.

Description. This 4-mile long Corps area covers roughly 191 acres. Including the adjacent State lands, the topography is rugged with steep slopes at the water's edge and some rolling hills in the uplands. Warm-season mixed grasses predominate. Cottonwoods/snowberry associations are found in some of the draws with scattered cedars also present. In the upper reaches of Mail Shack Creek there are some riparian areas of cottonwood, willow, and green ash.

The upper reaches of Mail Shack Creek have significant duck populations that nest in the area. Waterfowl of all types are numerous during spring and fall migrations. Least terns and piping plovers are known to nest on areas of exposed sandbars and shorelines.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

The northern portion of the area is used for upland game hunting although land access is difficult. The Mail Shack Creek State Waterfowl Refuge is a takeline refuge located on the southern end of the management area. There is no waterfowl hunting in this area.

This area was more easily accessible for hunting in the past. Section line roads into the area were maintained by Sully County. However, these section lines were vacated by the county in 1984 and were returned to the adjacent landowner.

Resource Objectives.

- Maintain the quality of habitat for upland game species and waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for big game species, as well as waterfowl.

LITTLE BEND NATURAL AREA

Management Unit. MU #014

Classification. Environmentally Sensitive

`Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Little Bend Natural Area is located on the Little Bend Peninsula in Sully County, South Dakota. Access to the southern portion of the area is by a gravel road that runs along the top of a ridge. Only foot traffic is allowed within the northwestern portion of the management area.

Description. This 642-acre Corps area is physically unique. This management area is located on a 6-1/2 mile long peninsula with rough topography especially on the northeast side. As a result of this topography, two distinct environments are present. One consists of the southwest-facing slope. This area is characterized by short grasses and sedges that are adapted to the intense, drying sunlight to which this slope is exposed. Plant species here include western wheatgrass, prickly pear cactus, rough sage and Canada thistle and kochia along the shoreline.

In contrast, the northeast-facing slope receives less direct sunlight, retains moisture longer, and supports a greater diversity of vegetation. The northeast slope provides better habitat and more food for the wildlife that inhabit the area. Plants here include both cool-season and warm-season grasses.

Both white-tailed and mule deer may be found in the draws within the natural area. Upland game species such as pheasant and grouse are also present. Small furbearers are known to reside in the area. Least terns and piping plovers historically have nested along the shoreline.

Part of this management unit was used as an air-to-air and air-to-ground gunnery range from 1943-1947. This old Armstrong gunnery range covers portions of what is now Sully and Dewey Counties. Because some pieces of practice bombs were found buried in the soil, this area was investigated as a Formerly Used Defense Site. A Report of Clearance is on file

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

This area is popular for hunting although no vehicles are allowed just beyond the Little Bend Recreation Area. Many archery deer hunters come to this area, perhaps because of the area's natural and remote qualities and the area's "spot and stalk" hunting method opportunities.

Resource Objectives.

- Provide opportunities for hunting
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area
- Promote non-consumptive uses of natural resources such as hiking, photography, and sightseeing

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of wildlife and fisheries
- Continue the maintenance and investigation of the man-made island for threatened and endangered species

Rationale. The Little Bend Natural Area is located along the upper portion of the Little Bend Peninsula. This site should be maintained as a natural area with limited facility development. The strategy is in keeping with the Environmentally Sensitive classification of preserving the existing wildlife habitat. Minimizing development will lessen the potential negative impact to wildlife habitat and will retain the natural state of the area. Because of the unique nature of the peninsula, a classification of Environmentally Sensitive is appropriate.

BAKERS GULCH AREA

Management Unit. MU #015

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Bakers Gulch Area is located in Sully County, South Dakota on lands east of the Little Bend peninsula to Bush's Landing and all lands surrounding Bakers Gulch. Access to this area is by boat or section-line gravel roads off of Highway 1804.

Description. The topography of the 3-mile long, 101-acre Bakers Gulch Area consists of rough breaks with those in the eastern portion of the area being the most severe. There are barren shale slicks especially on the west-facing slope of Bakers Gulch and steep cutbanks all along this area.

Isolated stands of cottonwood are found along portions of the shoreline. The remaining sparse vegetation consists of mixed grasses and forbs with patches of snowberry and chokecherry present.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. The result is that the area is a popular one for hunting although land access is difficult. The Bakers Gulch State Waterfowl Refuge is a takeline refuge that includes all islands and nearly all lands within this management area. Although waterfowl hunting is not allowed within the refuge, lands adjacent to it do receive considerable waterfowl hunting pressure.

Resource Objectives.

- Maintain the quality of habitat for big game and upland game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Plant shoreline vegetation, including flood-tolerant species, to control erosion
- Control noxious weeds

- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

SUNSET WILDLIFE AREA

Management Unit. MU #016

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area extends from Bush's Landing Recreation Area to the Sutton Game Production Area in northwest Sully County, South Dakota. Access is limited to section roads in some areas. Other areas are virtually inaccessible by land.

Description. Topography in this 287-acre Corps management area is very rugged with steep embankments and severe cutbanks. Vegetation is primarily mixed grass with limited woody vegetation in the draws and along the shoreline. Cottonwood/willow associations are becoming established along isolated areas of the shoreline where conditions permit.

During spring and fall migrations, waterfowl inhabit protected areas in some of the larger embayments. Bald eagles follow the flocks and feed on the old, young, or sick ducks and geese.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. A portion of the Sutton State Waterfowl Refuge (a waterline refuge) falls within this management area.

The Sunset Area does receive some hunting pressure although it is limited because of the difficult access.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species and waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species, as well as waterfowl.

SUTTON GAME PRODUCTION AREA

Management Unit. MU #017

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Sutton GPA is located south of the Sutton Bay Recreation Area in northwest Sully County, South Dakota. Access is limited to section roads and dirt trails.

Description. The topography of this 114-acre Corps management area and the adjacent State area is primarily rough steep breaks with some buttes. Vegetation is limited with mixed grasses predominating. Stands of green ash and eastern red cedar are found in a few of the draws. Cottonwoods and willows can be found in isolated areas along the shoreline.

A variety of wildlife species resides in the GPA. Both white-tailed and mule deer can be found along with sharp-tailed grouse. Because of the lack of suitable habitat, only a limited number of pheasant are present. Small furbearers such as fox, coyote, and raccoon can also be found.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. Because upland game and big game are plentiful, the area receives considerable hunting pressure.

Current wildlife management practices are limited. The extremely rough terrain prohibits extensive tree plantings although very small stands are occasionally added. Aerial broadcast of native grass or tree seed has been tried in the past but the result has been unsuccessful. Rotational grazing on some of the land has been performed in order to stimulate the generation of warm-season grasses.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe.

EIDAM AREA

Management Unit. MU #018

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area is in Sully and Potter Counties, South Dakota, extending northward from the Sutton Bay Recreation Area to the U.S. Highway 212 Bridge. Access to this area is limited to unimproved dirt trails. .

Description. The topography of this 484-acre Corps management area and the adjacent State area is quite varied. The southern end is characterized by very steep breaks while the northern end is characterized by rolling hills. Vegetation in this area consists of native mixed grasses and forbs. Isolated woody draws are found in the south with the draws and hills becoming progressively woodier toward the north. Bur oak, green ash, Rocky Mountain juniper, and eastern red cedar are found along this area. Chokecherry and snowberry are the primary understory species.

A variety of wildlife species are present because of the varied terrain. Mule deer are present in the southern portion of the management area while white-tailed deer are more predominant in the north. Sharp-tailed grouse and partridge are found throughout the area along with some pheasant. Significant populations of mourning dove reside in this area. Waterfowl and bald eagles are found in the area during spring and fall migrations.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

The Sutton Bottom State Waterfowl Refuge, a takeline refuge, is located on the bend of the river 2.5 miles east of the U.S. Highway 212 Bridge. Although waterfowl hunting is not allowed within the refuge, adjacent areas receive waterfowl hunting pressure.

Resource Objectives.

- Maintain the quality and diversity of habitat for upland and big game species and waterfowl
- Promote ecological integrity by controlling noxious weeds

- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species and waterfowl.

HARER AREA

Management Unit. MU #019

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Harer Area extends from the Highway 212 Lake Access northeast to the East Whitlocks Recreation Area in Potter County, South Dakota. Access to the area is by section roads and a road through a nearby private resort.

Description. The topography of this 74-acre Corps area and the adjacent State owned land is quite varied. In the southwest the land is predominantly steep breaks with some severe cutbanks. In the northern portion of the area the land is characterized by gently rolling breaks. The transition area between these topographical differences lies in the southeast. The South Whitlocks Resort is not included in this management area.

Vegetation varies with the topography. In the southwest there are many woody draws with oak, green ash, American elm, cottonwood, and willow species predominating. Understory in this area consists of sumac, chokecherry, and snowberry. By contrast, the northern reach consists mostly of grassland with limited woody vegetation.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Fishing is excellent in the area with the primary catches being walleye, small-mouthed bass, salmon, and some northern pike. Ice fishing is popular in the winter with the main catches being northern pike and walleye.

Resource Objectives.

- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

WHITLOCK BAY WILDLIFE AREA

Management Unit. MU #020

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Whitlock Bay Wildlife Area is divided into two segments. The first segment is located in Cheyenne Creek Bay between East Whitlocks and West Whitlocks Recreation Areas. The second segment begins at the northwest corner of the West Whitlocks Recreation Area and continues northwest for roughly 1-1/2 miles. Both segments are located in Potter County, South Dakota. Access is by both paved roads and dirt trails.

Description. The topography of this 193-acre Corps area and the adjacent State-owned area is primarily gently rolling hills with some cutbanks along the northwest portion. Vegetation consists of mixed grasses and forbs. Woody vegetation occurs mainly in the draws and along the shoreline. Green ash, cottonwood, snowberry, and chokecherry are the main species of woody vegetation that are naturally occurring.

Big and small game animals are present in this management area. Both white-tailed deer and mule deer can be found, with mule deer more common in the northwest. Sharp-tailed grouse, pheasant, and Gray partridge all reside in the general area. Small furbearers such as cottontail rabbits, fox, coyote, and raccoon can also be found. Large goose and duck populations can be found in the area during spring and fall migrations. Bald eagles also migrate through the area following the waterfowl.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

The SDGFP also operates a salmon spawning station within this management area. The spawning station provides a base of operations for collection of salmon eggs and in the past was used to collect brown trout and rainbow trout eggs. The facility has a fish ladder that is used by Chinook salmon in the fall and rainbow trout each spring during spawning and this ladder is operational when Lake Oahe water levels are above elevation 1580 ft m.s.l..

The Whitlock Bay Wildlife Area does receive considerable hunting pressure. Big game and upland game are plentiful and are drawn to the area by adjacent irrigated grain fields. Boating, fishing, and trapping are activities that are pursued in this area. The visiting public also enjoys non-consumptive resource uses such as bird watching, hiking, nature study, and photography.

Resource Objectives.

- Manage the vegetation resources for wildlife habitat, conservation of resources, and aesthetics
- Manage the wildlife and fishery resources to support propagation of the species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
-

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for fisheries as well as upland and big game species.

SWEDE'S DRAW AREA

Management Unit. MU #021

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area is located between Whitlocks Bay Wildlife Area and the Dodge Draw Recreation Area in northwest Potter County, South Dakota. Access is primarily by boat as land access is quite limited.

Description. The topography of the 390-acre Corps area and the adjacent State-owned area is primarily steep and rugged with some severe cutbanks along the shoreline. Mixed grasses and forbs predominate. Woody vegetation is present in some of the draws and consists of green ash, cottonwood, snowberry, and chokecherry.

White-tailed deer find valuable habitat in the woody draws. The piping plover, a federally listed threatened species, has used portions of this area for nesting and brood rearing. Waterfowl are numerous during spring and fall migrations, taking advantage of the many small bays and inlets located within this management area.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Cottonwood and willow trees have been planted along the shoreline, where feasible, to control erosion and provide additional woody vegetation in the area. Green ash, Russian olive, chokecherry, and plum have been planted in selected draws to increase winter cover.

A State-designated waterfowl refuge is located within the Swede's Draw Area. The Latin Draw Waterfowl Refuge is a takeline refuge located in the center of this management area. This is a "no hunting" area that provides a safe haven for migrating waterfowl.

Resource Objectives.

- Maintain the quality of habitat for big and upland game species
- Promote ecological integrity by controlling noxious weeds

- Preserve, protect, and monitor any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Provide opportunities for hunting
- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

BROWN'S CREEK AREA

Management Unit. MU #022

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 m.s.l.)

Location. The Brown's Creek Area extends from Dodge Draw Recreation Area to the Le Beau Lake Access Area and includes land in both Potter and Walworth Counties, South Dakota. Access is limited.

Description. The topography of this 448-acre Corps area and the adjacent State-owned area is gently rolling hills with several defined drainageways. The herbaceous vegetation is short grass prairie consisting of prairie Junegrass, needle-and-thread grass, blue grama, little bluestem, salsify, and foxtail barley with forbs consisting of leadplant, western yarrow, yucca, sage, and wormwood. Sumac, snowberry, cottonwood, and willow are the main woody species found in the draws. Isolated stands of cottonwood and willow may be found growing along the shoreline.

White-tailed deer and mule deer are common residents. Ducks and geese nest in the upper reaches of the embayments and grasslands. Of the waterfowl, ducks predominate with teal, gadwalls, mallards, and pintails the major species present.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

The Brown's Creek Area is managed to maintain riparian areas for waterfowl, upland, and big game species. Shoreline plantings of cottonwood and willow and woody draw plantings of green ash, Russian olive, chokecherry, and plum have been made to improve the habitat in riparian areas and draws. This management area is popular with hunters and fishermen. These groups take advantage of the facilities offered in the Dodge Draw Recreation Area and the Le Beau Lake Access Area.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

HAUCK RANCH AREA

Management Unit. MU #023

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Hauck Ranch Area is located between the Le Beau Lake Access and Swan Creek Recreation Area in Walworth County, South Dakota. Vehicle access is limited.

Description. Topography in the 330-acre Corps area and the adjacent State-owned area is varied. Rolling hills are found on both the northern and southern portions of the area but it is relatively flat in the center and near the Swan Creek drainage. Wheatgrass and brome are the dominant herbaceous vegetation. Bottomland hardwoods consisting of bur oak, American elm, and box elder are found along the upper reaches of Swan Creek. Cottonwood and willow species are found along the shoreline.

A variety of waterfowl can be found in the inlets during spring and fall migration especially in the Swan Creek embayment. The conditions in the Hauck Ranch Area also make this excellent habitat for mourning dove with high populations of these birds in this area.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

This area is managed to maintain the vegetation in the upland areas and riparian areas for upland and big game species as well as waterfowl. Planting of trees in the bottomland areas were undertaken in the past to increase the amount of woody vegetation and dense nesting cover.

The State-designated Swan Creek Waterfowl Refuge is a waterline refuge located in the area of Swan Creek. This "no hunting" area functions as a resting area for migrating waterfowl. As a result, waterfowl hunting is popular in the areas adjacent to the refuge. Fishing is also a popular activity, especially in Swan Creek Bay. The major catches out of this bay are walleye and northern pike, with catfish taken in the upper reaches of the bay.

Resource Objectives.

- Maintain and improve the quality and diversity of vegetative resources to provide food and shelter for a variety of wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species, as well as waterfowl.

PERO CREEK AREA

Management Unit. MU #024

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Pero Area extends from the Swan Creek Recreation Area to the Bowdle Beach Lake Access in Walworth County, South Dakota. Access is limited to section roads in the south.

Description. The terrain of the Corps-owned 192-acre Pero Creek Area and the adjacent State-owned area is varied with gently rolling hills in the south to slightly more rugged terrain in the north with some low eroding cutbanks. Brome and wheatgrasses predominate on the uplands. Cottonwoods and willows are found in isolated stands along the shoreline while bur oak, chokecherry, snowberry, and sumac are found in the draws.

A variety of waterfowl are found in the bays during spring and fall migrations with some ducks nesting in the upper reaches of Pero Creek.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

The Swan Creek Waterfowl Refuge (mentioned in the Hauck Ranch area narrative) lies partly within the southern portion of this management area.

Resource Objectives.

- Maintain the quality of habitat for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species, as well as waterfowl.

TWO FORKS AREA

Management Unit. MU #025

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This Walworth County, South Dakota area extends from Bowdle Beach Lake Access to the Walth Bay Recreation Area. Access is by section road.

Description. The topography of this 93-acre Corps area and the adjacent State-owned area is characterized by gently rolling hills with some steep cutbanks. Brome and wheatgrass are the dominant grass species. Cottonwood and willow are found along the shoreline.

Although this area is noted for its upland game habitat, a variety of waterfowl are known to use the area during spring and fall migrations.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Resource Objectives.

- Maintain the quality and diversity of vegetation resources to provide food and shelter for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

NEW EVARTS AREA

Management Unit. MU #026

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The New Evarts Area extends north from the Walth Bay Recreation Area to the Thomas Bay Recreation Area in Walworth County, South Dakota. Access to the area is by section roads and trails.

Description. The topography in this 93-acre Corps management area and the adjacent State-owned area is varied. From Walth Bay to the middle of the area, the terrain can be described as gentle to flat. The northern half of the area consists of rough rangeland breaks. These breaks become progressively steeper near Thomas Bay. Vegetation within this management area is primarily mixed grass with scattered stands of cottonwood, willow, and Russian olive along the shoreline and green ash and chokecherry in the draws.

Mule deer and white-tailed deer reside in the area, as do upland game birds such as sharp-tailed grouse, pheasant, and partridge. Waterfowl are plentiful during their migration periods. The adjacent irrigated grain fields probably draw all of these species to this area.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Hunting and fishing are popular activities in this management area. A resort located on nearby private land offers a variety of facilities and services that support these activities. Hiking, nature study, and photography are undertaken in limited amounts. WEB Rural Water System has an intake located in the central portion of the management area. Several agriculture intakes also are in this area. A proposed water intake for a generation plant (NextGen) is planned in this unit

Resource Objectives.

- Maintain the quality of habitat for upland game and big game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as a travel corridor for upland and big game species between the adjacent lands and Lake Oahe.

SOUTH BLUE BLANKET AREA

Management Unit. MU #027

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area extends from the Thomas Bay Recreation Area to the Keszler Area; however, it does exclude the Blue Blanket Creek GMA located in the upper reaches of Blue Blanket Creek. This Walworth County, South Dakota area is located approximately 6 miles southeast of Mobridge. Access to this area is by a gravel road off of Highway 1804.

Description. The topography of this 180-acre Corps area and the adjacent State area can best be described as rolling hills with some steep breaks. There are some small islands and sandbars within this management area that are low, flat, and vegetated. The South Blue Blanket Area is covered with short grasses such as western wheatgrass, little bluestem, buffalo grass, and side-oats grama. Cottonwood and willow have become established along the shoreline in some areas. Green ash, buck brush, and wild rose can also be found.

Waterfowl are plentiful during spring and fall migrations. Bald eagles are also seen in the area as they follow the waterfowl migrations. Threatened and endangered species are drawn away from high visitation areas and routinely use the shoreline, islands and sandbars of this management unit.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the surrounding area.

The South Blue Blanket Area is primarily managed for a variety of waterfowl. There is a State-designated waterfowl refuge in this area. The Blue Blanket Waterfowl Refuge is a waterline refuge that extends from just north of Thomas Bay to the Blue Blanket Creek Game Management Area.

Resource Objectives.

- Maintain the quality of habitat for upland game and other wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

- Protect any federally or State-listed threatened and endangered species that may periodically use the area

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as habitat for waterfowl and threatened and endangered species.

BLUE BLANKET CREEK GAME MANAGEMENT AREA

Management Unit. MU #028

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Blue Blanket Creek GMA is located in the upper reaches of Blue Blanket Creek northeast of SD Highway 1804 in Walworth County, South Dakota. Access to the area is by that same highway.

Description. The 117-acre Blue Blanket GMA has terrain that is relatively flat to gently rolling. Vegetation is comprised of mixed grasses with some cottonwood and willow along the shoreline. Snowberry, chokecherry, and plum thickets can be found in some of the draws.

A short-term fisheries sub-impoundment was located in the upper reaches of Blue Blanket Creek and was used for fish production. The dam was breached some time ago. The remaining impoundment serves as a small backwater area for waterfowl and area wildlife.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. The Blue Blanket Creek GMA is managed for a variety of waterfowl including the endangered least tern and threatened piping plover. This area lies within the State-designated Blue Blanket Waterfowl Refuge.

Resource Objectives.

- Maintain the quality of habitat for upland and big game species and waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State- or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds

- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for waterfowl.

KESZLER AREA

Management Unit. MU #029

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Keszler Area is located between the South Blue Blanket Area and Indian Creek Recreation Areas in Walworth County, South Dakota. Access to the area is via dirt trails and section roads leading from SD Highway 1804.

Description. The topography of this 329-acre area is gently rolling. Vegetation in this area is mainly native mixed grasses and yellow sweet clover. Trees are sparse with isolated eastern red cedars found in some draws. Cottonwood and willow are found in some areas along the shoreline.

With the mix of native grasses and the nearby grain fields, this area provides good winter habitat for pheasant, sharp-tailed grouse, and partridge. Occasional sightings of white-tailed deer are made in the area. Shoreline birds, such as long-billed curlew and killdeer, are plentiful.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Resource Objectives.

- Maintain the quality of habitat for upland game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as habitat for upland and big game species.

NATURAL RESOURCES OFFICE

Management Unit. MU #030

Classification. Operations

Management Agency. Corps of Engineers

Location. The Natural Resources Office is located approximately 2 miles southeast of Mobridge and roughly 110 miles north of Oahe Dam. The office is located at the entrance to the Indian Creek Recreation Area. Access is by paved county road off of U.S. Highway 12.

Description. This 8-acre fenced-in compound is primarily flat. Wildlife species in this area include squirrel, rabbit, and ground squirrels. Vegetation is limited, mostly crested wheatgrass, Kentucky blue grass and brome.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is used as the base station to staff and store the equipment and materials for the natural resource mission on the Oahe project in this region of the lake.

Resource Objectives.

- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Operate and maintain the facilities in an environmentally safe manner

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Operations is assigned to the Natural Resources Office because an office is needed in the Mobridge area to serve the center portion of the Oahe project. Operation of the project is the primary aspects of management of this area.

MOOSE FLATS AREA

Management Unit. MU #031

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area is located in Walworth County, South Dakota between Revheim Park and the U.S. Highway 12 bridge but excludes the Mobridge Waterfront area. This area is unique because it is located below elevation 1607.5. Access to the southeastern portion is by a dirt road that runs to the northern end of the Mobridge Waterfront area. Access to the northern portion of the area is limited.

Description. The 735-acre Moose Flats area is flat and gently sloping toward the shoreline. It is a relatively wooded area with stands of cottonwood and willow along the shoreline and some upland areas. Thistles and kochia are invasive species in this area, but grasses and other successional species have started to take these over.

Pheasants and sharp-tailed grouse are plentiful. White-tailed deer are occasionally seen in the area. Small furbearers such as skunk, fox, raccoon, rabbits, and beaver are also found on occasion.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

The area is managed to maintain the habitat for upland game and waterfowl. The area contains excellent habitat for upland game but because of the area's close proximity to the town of Mobridge, hunting is not allowed.

Resource Objectives.

- Maintain the quality of habitat for upland species
- Promote ecological integrity by controlling noxious weeds, tumble weeds, kochia
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use by wildlife and fisheries
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Moose Flats Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Management of non-desirable species is prudent in this area upon exposure so noxious weeds or tumble weeds do not get out of control and impact the adjacent community of Mobridge.

WATER PLANT BAY AREA

Management Unit. MU #032

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area extends from the west end of Water Plant Bay to Rorgo Bay and includes land in both Walworth and Campbell Counties, South Dakota. Access is limited in the northern portion of this management unit but in the south, the area can be accessed from a section line road northwest of Mobridge.

Description. The topography of this 250-acre Corps management area and the adjacent State-owned area is gently rolling hills with some steep cutbanks along the shoreline. Along portions of this management area, erosion can be quite severe as a result of the northwesterly winds that buffet the area.

Woody vegetation is confined primarily to the draws. Both white-tailed deer and mule deer inhabit the adjacent State-owned area. Upland game species such as sharp-tailed grouse, pheasant, and Gray partridge are also present. Many small furbearers reside in the management area and include fox, skunk, coyote, and cottontails.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. Because of the variety of game present on adjacent lands, there is considerable hunting pressure. Activities such as fishing, wildlife viewing, and photography are sometimes observed.

Resource Objectives.

- Maintain the quality of habitat for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Stabilize the shoreline

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use of wildlife, fisheries, and endangered species
- Purchase additional lands to extend the takeline on the east side of Lake Oahe in order to prevent encroachment onto private land
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

Special Site Conditions. During the Eisenhower administration, lands purchased for the construction of Lake Oahe were kept to a minimum. In some areas, this resulted in very little fee land remaining after the reservoir was filled. The Water Plant Bay Area is located on a stretch of Lake Oahe that is exposed to heavy wave action. The soil in some portions of the area is composed of friable material and is easily eroded. Because of the very narrow takeline in portions of the Waterplant Bay Area and the area's susceptibility to erosion, there are several locations where the lake has encroached onto private land. Upon a claim, measures should be undertaken to investigate alternatives to resolve these potential encroachments through the stabilization of the eroding banks and/or the purchase of easement for the additional property.

RORGO BAY AREA

Management Unit. MU #033

Classification. Environmentally Sensitive

Management Agency. Corps of Engineers (below elevation 1620 m.s.l.)

Location. This management area is located on the south side of Rorgo Bay in Campbell County, South Dakota. Access is by gravel road from SD Highway 1804.

Description. The topography of this 4-acre management area is relatively flat with a few gently rolling hills. Portions of this area have very steep cutbanks that are susceptible to erosion. Shale outcroppings can be seen throughout this management area.

Within the Rorgo Bay Area, crested wheatgrass, brome, sage, and yucca are the predominant vegetative species present. There are a few isolated eastern red cedars scattered in the area, as well as occasional cottonwood along the shoreline. There are no developed recreation facilities in this area.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Most of the visitors to this lake access are from the local area. The primary activity enjoyed is fishing. This area is somewhat popular during the spring for walleye and in the fall for northern pike. Hunting (especially for pheasant and sharp-tailed grouse) and sightseeing are other activities that are noted in the area.

Resource Objectives.

- Maintain the quality of habitat for upland game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Plant shoreline vegetation, where feasible, to improve the overall aesthetic quality of the area, to control erosion, and to provide additional wildlife habitat. .

- Control bank erosion where necessary
- Create test areas for biocontrol of saltcedar
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. This area had significant settlement by both Plains Indians and Euro-Americans. The unique historical character of this area makes Environmentally Sensitive an appropriate land classification for the Rorgo Bay Area.

LOCKE CREEK AREA

Management Unit. MU #034

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Locke Creek Area extends roughly 7 miles along the east shore of Lake Oahe from Rorgo Bay to Little Leola in Campbell County, South Dakota. Because of the rugged terrain and steep cutbanks, access is limited to boats.

Description. The terrain in the 373-acre Locke Creek Area and the adjacent State-owned area is rugged with open areas and rangeland. A mixed grass prairie is predominant in this area with some introduced species like smooth brome and crested wheatgrass. Woody species of green ash, cottonwood, and bur oak are found primarily in the draws.

This area provides transition habitat for a variety of wildlife moving between the uplands and Lake Oahe. Mule deer are most often seen in the area with occasional sightings of white-tailed deer. Upland game species, such as pheasant, sharp-tailed grouse, and partridge, are found in the area. Other species that inhabit the area include raptors such as hawks, small furbearers (cottontails, fox, coyote, and beaver), and several species of ducks and geese.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

This area is a popular hunting area because of the wide variety of plentiful game. Shelterbelts have been established in some of the draws in order to increase the amount of winter cover and woody vegetation.

Resource Objectives.

- Maintain the quality of habitat for upland species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use by wildlife, fisheries, and endangered species
- Establish food plots to supplement existing food sources for wildlife species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as a travel corridor for upland and big game species moving between the uplands and Lake Oahe.

HELB AREA

Management Unit. MU #035

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area extends from the Little Leola Lake Access to the Shaw Creek Recreation Area in Campbell County, South Dakota. Access is by boat and a few trails.

Description. The topography of the 2-mile long 132-acre Helb Area is moderately rugged with rolling hills that flatten out toward the shoreline. There are fairly steep cutbanks in some locations. Shale and gumbo soils predominate with occasional slick spots evident. Primary grasses include brome and crested wheatgrass. The southern portion of this area is slightly more rugged with some silverberry and snowberry thickets. In the northern end, toward Shaw Creek, stands of cottonwood are found.

Wildlife species in the adjacent area are upland game birds, primarily pheasant and sharp-tailed grouse. There are occasional sightings of mule deer and some white-tailed deer also in the area.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Because of the availability of game, this area receives considerable hunting pressure. Fishing does occur especially in the south near the Little Leola area and in the north near Shaw Creek.

Resource Objectives.

- Maintain the quality of habitat for wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Balance the vegetation management on exposed lake beds for future biomass use by wildlife, fisheries, and endangered species
- Control noxious weeds

- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as a travel corridor for upland and big game species between the adjacent lands and Lake Oahe. The area is suitable for additional wildlife plantings.

RITTER BAY AREA

Management Unit. MU #036

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This Campbell County, South Dakota area extends from Shaw Creek Recreation Area to the West Pollock Recreation Area. Access to the area is by section line roads and dirt trails.

Description. The 315-acre Ritter Bay Area consists of land that is rolling to rough with steep cutbanks in the southern portion of the management area. The most commonly found grasses in the area are brome, little bluestem, and big bluestem. Along the shoreline, there are scattered stands of cottonwood, willow, and green ash. A variety of waterfowl can be found in the small isolated bays during times of migration. Beaver are also present in the upper reaches of the bays.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. The many small inlets within this area provide excellent habitat for migrating waterfowl. Because of the variety of game available on adjacent lands, this area does receive considerable hunting pressure.

Resource Objectives.

- Maintain the quality of habitat for a variety of wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as a travel corridor for upland and big game species moving between adjacent lands and Lake Oahe.

POLLOCK BAY WILDLIFE AREA

Management Unit. MU #037

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This area is located approximately 1/2-mile west of the town of Pollock in Campbell County. Access to the area is by gravel road leading from SD Highway 1804.

Description. The terrain of the 22-acre West Pollock Wildlife Area is flat with some steep cutbanks. Vegetation in this recreation area consists primarily of disturbed field grasses and forbs. There are a few shallow woody draws containing small stands of bur oak, Siberian elm, hackberry, and chokecherry. Cottonwood and willow are abundant along the shoreline.

There are pheasant and sharp-tailed grouse that reside in the area. Deer are seen only on occasion as they wander in from adjacent farm fields. The area does have a substantial beaver population and beavers are most often seen building their lodges in Pollock Bay. Waterfowl are numerous in Pollock Bay during their spring and fall migrations.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. Because of its close proximity to the town, the West Pollock Wildlife Area receives little hunting pressure. Shoreline fishing along the banks is popular, especially with children.

Resource Objectives.

- Maintain the quality of habitat for a variety of wildlife species
- Manage vegetation during low water to protect the town of Pollock from fire
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Plant food plots for wildlife to supplement the existing food sources

- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the West Pollock Wildlife Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe.

POCASSE WILDLIFE AREA

Management Unit. MU #038

Classification. Multiple Resource Management - Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Pocasse Wildlife Area encompasses most of Lake Pocasse east of Pollock in Campbell County, South Dakota except those lands included in the Pollock Recreation Area. Access to the area is from either SD Highway 1804 or SD Highway 10.

Description. This 333-acre Corps area surrounds what was the original site of the town of Pollock. In the 1960s, during the construction of the Oahe project, the town was relocated to its present location. Lake Pocasse was a sub-impoundment that was formed from the rising waters of Lake Oahe.

The topography of this Corps area and the adjacent State-owned area is flat with dense riparian areas and wetlands along the shoreline. Brome, crested wheatgrass, and green needlegrass predominate. Cottonwood and willow with some green ash are also found in ample amounts in the area.

In addition to providing habitat for white-tailed deer, sharp-tailed grouse, pheasant, and partridge, Pocasse Wildlife Area is a major staging area for waterfowl and sandhill cranes during fall migration. It is also a staging area for whooping cranes. The stable water in Lake Pocasse also attracts a wide variety of other water birds including coots, white pelicans, great blue heron, cormorants, egrets, and loons.

Silt deposits are carried into Lake Pocasse by Pocasse Creek, gradually making the lake shallower. Because a low quantity of water enters Lake Pocasse, the silt is dumped almost immediately upon entering the lake. As the water elevation of Lake Oahe and, subsequently, Lake Pocasse goes down, fish concentrate in the deeper waters and eventually die off.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Visitation to the area is limited but considerable fishing does occur with northern pike, walleye, carp, small-mouth bass, and perch the primary takes. Other activities enjoyed in this area include bird watching, photography, and nature study.

Resource Objectives.

- Manage vegetation resources for wildlife habitat and the conservation of resources
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Provide waterfowl/wildlife viewing area
- Construct silt retention structure
- Control noxious weeds including the use of biological controls for Canada thistle
- Provide appropriate protection for any cultural resources

Rationale. Silt deposits being carried into Lake Pocasse are making the lake shallower. Employment of various management techniques may provide opportunities to increase the fishery while serving the needs of waterfowl and shorebirds. Because the Pocasse Wildlife Area is managed for wildlife, this area supports a land use classification of Multiple Resource Management - Wildlife Management.

LAKE POCASSE DAM AND CONTROL STRUCTURE

Management Unit. MU #039

Classification. Project Operations

Management Agency. Corps of Engineers

Location. This management area is located north of the town of Pollock in Campbell County, South Dakota. The dam embankment provides the base for SD Highway 1804.

Description. This 7-acre area consists of an earthen embankment with riprap on both the upstream and downstream sides, a concrete spillway on the northern end, and a concrete culvert control structure on the southern end. The dam was constructed to maintain a sub-impoundment, Lake Pocasse, which is operated as a wildlife refuge by the FWS.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is used to control the level of water in Lake Pocasse. The majority of the use of this management area is by traffic crossing on SD Highway 1804. There is some shoreline fishing that does occur off of the dam either into Lake Pocasse to the east or Pollock Bay to the west.

Resource Objectives.

- Provide an adequate control structure to ensure the integrity of the Lake Pocasse sub-impoundment

Development Needs. This area should be maintained as it is at the present time. No development needs are foreseen.

Rationale. This dam and control structure creates and maintains the level of Lake Pocasse. No further development is necessary to accomplish these purposes. A land use classification of Project Operations is appropriate.

POINT LA GRACE AREA

Management Unit. MU #040

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area is in Campbell County, South Dakota, extending from the north end of Lake Pocasse Dam to the south end of Meyers Bay. Access to this area is limited to a few section line trails.

Description. The topography of this 371-acre Corps area and the adjacent State-owned area is characterized by gently rolling hills. Medium cutbanks are present with some erosion occurring on the northern portion of the area. Vegetation in this area includes mixed native grasses, primarily switchgrass, brome, and crested wheatgrass. There are scattered stands of bur oak and snowberry in the draws. Cottonwood and willows can be found along the shoreline. In the northern portion of this management area there are some small wetland areas with rushes, sedges, and *Phragmites*. Leafy spurge, a noxious weed, exists in portions of this area.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area.

Waterfowl are found in the area during spring and fall migration periods. There are significant populations of ducks and geese that use the wetland areas year-round. Sandhill cranes can be found during migration times. All of these species are attracted to the area by the availability of grain from the existing food plots and by nearby agricultural lands. Furbearers, such as beaver, fox, coyote, and rabbit, also inhabit this management area.

Even though access to the area is limited, there is considerable hunting pressure for deer and upland game. Fishing also is a popular activity in those areas where the shoreline can be easily reached.

Resource Objectives.

- Maintain the quality of habitat for both upland game and migrating and resident waterfowl
- Promote ecological integrity by controlling noxious weeds

- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries
- Develop additional wetlands in the small embayments present for waterfowl habitat
- Implement an aggressive noxious weed control program (including biological controls) to control leafy spurge,
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species, as well as waterfowl.

MEYERS BAY AREA

Management Unit. MU #041

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Meyers Bay area is located roughly 1 mile northwest of the Point La Grace Area in Campbell County, South Dakota just south of the North Dakota/South Dakota State line. Access is by a dirt trail leading from SD Highway 1804.

Description. The terrain of the 106-acre Meyers Bay area is flat to gently rolling with a few small cutbanks. There are small wetland areas located in the upper end of Meyers Bay. Vegetation consists of tall mixed grasses with few isolated cedars. Cottonwood and willows can be found along the shoreline.

Sharp-tailed grouse, pheasant, and occasional white-tailed deer inhabit this area. Furbearers such as cottontail rabbits, jackrabbit, beavers, fox, and coyote are also found in this area. Waterfowl congregate in the embayment during migration periods.

The CRMP has identified cultural sites in this general area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Corps area which extends from the lake up to elevation 1620 feet m.s.l. is subject to periodic flooding as a result of lake operation. When not inundated, the area is managed for wildlife consistent with the fundamental management purposes of the area. Stands of cottonwood and willows have been established in some areas along the shoreline and easily accessible draws.

Local residents use the Meyers Bay area as a relatively quick access for hunting and fishing. This area and the adjacent State-owned area does receive moderate hunting pressure.

Resource Objectives.

- Maintain the quality of habitat for upland game and waterfowl.
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Meyers Bay Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe.

STATE LINE WILDLIFE AREA

Management Unit,. MU #042

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Emmons County

Location. The State Line Wildlife Area is in Emmons County, North Dakota, extending from the North Dakota/South Dakota State line north to Langelier Bay Recreation Area. Access to the area is by several dirt trails leading from ND Highway 1804.

Description. The topography of the 107-acre State Line area is varied. In the south, a flat plateau is evident which flattens out toward the shoreline. In the northern portion, the topography is steep and hilly with steep cutbanks and a few woody draws. Active erosion occurs in this area. Vegetation in this area is primarily mixed native grasses such as blue grama, sideoats grama, and buffalo grass. Scattered areas of bur oak and chokecherry exist in the draws leading from the shoreline.

This area provides excellent habitat for white-tailed deer. Upland game birds, primarily pheasant and sharp-tailed grouse, and a few partridge also inhabit the area. Furbearers including coyote, fox, and jackrabbit are seen on occasion. The least tern and piping plover, species that are federally listed as endangered and threatened, respectively, nest in the sandy areas along the shoreline.

CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed primarily for the benefit of wildlife species. Scattered tree plantings may be found throughout the area. This is a major area used by the least tern and piping plover for nesting and brood-rearing activities. This area receives mostly fishing and some hunting use.

Resource Objectives.

- Improve habitat for least tern and piping plover
- Upgrade the quality of habitat for upland and big game species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Develop additional tree and shrub plantings.
- Increase the amount of dense nesting cover for upland game species
- Protect site from erosion
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the State Line Wildlife Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees or shrubs.

Because this is a nesting and brood-rearing area for least terns and piping plovers, additional development should be limited and should not interfere with historic nesting areas.

MOSER BAY AREA

Management Unit. MU #043

Classification. Multiple Resource Management: Recreation – Low Density

Management Agency. Emmons County, North Dakota

Location. Moser Bay Area is located in Emmons County, North Dakota. Access to the area is by Highway 1804.

Description. This roughly 15-acre area includes the Moser Bay boat ramp that Emmons County leases for the adjacent resort. The topography is flat plateau which flattens out toward the shoreline.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed for lake access. Visitation is seasonal, coinciding with early-season fishing as well as fall hunting. Some shoreline camping occurs during the summer months.

Resource Objectives.

- Maintain lake access
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Provide additional parking as warranted
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries
- Create public awareness plan so people are aware of threatened and endangered species

Rationale. A land use classification of Multiple Resource Management: Recreation- Low Density is assigned to the Moser Bay Area because it serves the local residents of Emmons County and the State Line resort as and access point for water based recreation.

LANGELIER BAY RECREATION AREA

Management Unit. MU #044

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Emmons County, North Dakota

Location. Langelier Bay Recreation Area is located in Emmons County, North Dakota, approximately 2 miles north of the North Dakota/South Dakota State line. The area is accessible by a 1-mile paved road, leading from ND Highway 1804.

Description. The topography of the 59-acre Langelier Bay area is gently sloping for most of the area but is steep at the southwest corner of the bay. Because the shoreline is buffeted by high wind and receives considerable wave action, there are severe cutbanks located on the west end of the recreation area. Vegetation consists of mixed grasses with crested wheatgrass, brome, and sideoats grama the major species. There are a few green ash scattered in the area while cottonwood and willow are found along the shoreline. Buffaloberry and snowberry can also be found in the area.

Wildlife consists of upland game birds - primarily pheasant and sharp-tailed grouse with some partridge. Canada geese and ducks can be found in the bay during migration although some nesting does occur. Songbirds are found throughout the area.

Facilities in the Langelier Bay Recreation Area include a boat ramp, courtesy dock, fish-cleaning table, and vault toilet, primitive camping, and a wheelchair loading platform for boats .

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to this management area is light to moderate. Visitation is seasonal, coinciding with early-season fishing as well as fall hunting on adjacent lands. Some shoreline camping occurs during the summer months. Visitors to the Langelier Bay Recreation Area originate from Pollock, South Dakota; Strasburg, North Dakota; and other points east of Lake Oahe.

Resource Objectives.

- Provide resource-oriented development
- Provide lake access for boating, fishing, and hunting
- Provide minimum recreation opportunities for day use and primitive camping
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Delineate camping sites
- Provide potable water
- Provide picnic tables and grills
- Upgrade fish cleaning facilities
- Plant trees and shrubs in the area to provide shade and shelter.
- Provide boating access during various water levels
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Langelier Bay Recreation Area should be maintained as a low-density recreation area. This area primarily serves the residents of Emmons County. The organized development of limited facilities would lessen the potential negative impacts on wildlife in the area. The topography and the north-facing slopes provide an opportunity to establish additional woody vegetation. A land use classification of Multiple Resource Management: Recreation - Low Density is appropriate for this area.

NEW HAVEN AREA

Management Unit. MU #045

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This Emmons County, North Dakota area includes the north shore of Langelier Bay and extends northward to the Cattail Bay Recreation Area. Primary access to this area is by boat. Vehicle access is severely limited by the lack of suitable roads and no guaranteed access across private land.

Description. The 636-acre New Haven area can be described as hilly with some flat areas throughout. There are many small drainages located within this area. Active erosion takes place in those areas exposed to heavy wind and wave action. Vegetation is predominantly mixed grasses such as crested wheatgrass, blue grama, and sideoats grama. Green ash, bur oak, cedar, plum, chokecherry, buffaloberry, and snowberry can be found in some of the draws. Cottonwood and willow stands can be found in isolated areas along the shoreline.

The wooded draws provide habitat for both mule deer and white-tailed deer. In the southern portion of the area, pheasant are more plentiful. However, in the northern portion, sharp-tailed grouse and partridge predominate. Jackrabbits and cottontails can be found throughout the area. Furbearers including coyote, fox, and raccoon also inhabit the area.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed primarily for the benefit of wildlife species. Scattered tree plantings may be found throughout the area. Many of the species inhabiting the northern portion of the management area are attracted to the nearby grain fields. This area does receive considerable hunting pressure.

Resource Objectives.

- Provide and maintain high quality and diverse vegetation resources to provide food and shelter for area wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Plant trees and shrubs to increase the winter cover, woody vegetation, and food sources for wildlife
- Establish food plots to supplement the existing food sources for waterfowl, big game, and upland game species
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the New Haven Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees or shrubs. Because of the area's inaccessibility, it is best managed for wildlife.

CATTAIL BAY RECREATION AREA

Management Unit. MU #046

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Corps of Engineers

Location. Located on the southeast corner of Cattail Bay, the Cattail Bay Recreation Area is located in Emmons County, North Dakota approximately 22 miles west of Strasburg. Access to the area is by 5 miles of an all-weather gravel road leading from ND Highway 1804. During periods of extremely high lake elevations, this access road becomes inundated.

Description. The 47-acre Cattail Bay Recreation Area is relatively flat with easy access to the shoreline. Vegetation consists of mixed grasses, primarily blue grama and sideoats grama. Cottonwood and willows grow along the shoreline. Some planted shelterbelts exist in the northeast portion of the area.

Pheasant find an abundance of food and cover in this management area. Occasional sightings of white-tailed deer, raccoon, and beaver are also noted. Songbirds, especially bluebirds, are numerous in this bay. Because of the protected nature of the bay, ducks and geese can often be found here.

Facilities in this developed recreation area include a single-lane boat ramp, courtesy dock, fish cleaning table, vault toilets, picnic tables, and camping area. The low water boat ramp for Cattail Bay is located north at Jennerville, within the Rivery Wildlife Area (MU 75).

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Cattail Bay Recreation Area is light to moderate. Visitors primarily come from the Bismarck area, although there are significant numbers of visitors from Linton and other local communities. This recreation area receives a high amount of camping and fishing use during the summer. Fishing activity is directed toward walleye and northern pike with some white bass taken in the spring. In the fall, hunters use this area as a base camp.

The northeast portion of this management area has numerous plantings for a variety of wildlife species. Shelterbelts of eastern red cedar and Russian olive have been planted. Plum, chokecherry, apricot, and caragana have also been planted to supplement the existing wildlife food supply.

Resource Objectives.

- Provide resource-oriented development
- Provide lake access for boating and fishing
- Provide recreation facilities for day use and camping
- Provide hunting opportunities for upland game and big game species
- Promote the nonconsumptive use of wildlife
- Maintain and manage the existing vegetation to provide habitat for upland game birds and other wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop a comprehensive site plan for the area
- Delineate day use area from camping area
- Install security light at the boat ramp
- Provide potable water
- Construct picnic shelters in the day use and camping area
- Plant trees, shrubs, and food plots in the area to increase winter cover and to supplement the existing wildlife food supply
- Create shoreline access
- Create winter ice fishing access for low water situations
- Interpret local history of adjacent sensitive areas
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Improve road access into the recreation area

Rationale. The Cattail Bay Recreation Area is easily accessible from ND Highway 1804. The area receives considerable regional use. The all-weather access road and the excellent walleye and northern fishing make this area a popular spot for visitors from south-central North Dakota. The diversity of wildlife habitat, along with the area's isolation, is highly valuable to wildlife. As a result, the lands adjacent to the Cattail Bay area receive considerable hunting pressure. The organized development of the recreation facilities will lessen the potential negative impact on the wildlife habitat in the area. The wide range of visitor uses, the easily accessible shoreline, the quality of the resources of the surrounding area, and the potential for increased development supports a land use classification of Multiple Resource Management: Recreation - Low Density.

Although this area currently receives some use, it has not been developed to its full potential. Additional future demand is possible, in part because of the proposed Fort Yates Bridge. A site plan should be prepared prior to the expansion of the existing recreational facilities.

WINONA ISLAND NATURAL AREA

Management Unit. MU #047

Classification. Environmentally Sensitive

Management Agency. Corps of Engineers

Location. Winona Island is located in Cattail Bay, immediately northwest of the Cattail Bay Recreation Area in Emmons County, North Dakota. The island is east of and across the lake from the town of Fort Yates. Access to the island is limited to boats. However, during periods of low water elevation the island may be accessed on foot.

Description. This 391-acre island is flat and heavily wooded. Grasses in the area are thick and are a mixture of grasses, primarily crested wheatgrass, big bluestem, little bluestem, and barnyard grass. Woody vegetation includes cedar, green ash, boxelder, oak, cottonwood, and willow with understory species of buffaloberry, chokecherry, plum, snowberry, and June berry.

Because of its isolated nature, the island supports large populations of white-tailed deer and pheasants. A variety of raptors use this area for roosting, nesting, and feeding. Waterfowl are plentiful in the adjoining bay. Great blue herons can also be seen feeding around the island. Furbearers such as raccoon, fox, and coyote are also plentiful. The island does support major populations of rattlesnakes and bull snakes.

Winona Island is the site of the “boom town” of Winona, an Indian word for "First Child, if a girl." The town, also called “Devil’s Colony,” grew up at the same time as Fort Yates. The major businesses on the island were the saloons with their fancy ladies, dance halls, and restaurants - all of which catered to the soldiers and traders stationed across the Missouri River at Fort Yates. The population of Winona reached a maximum of nearly 1600 in the late 1800s. With the incorporation of Linton as the Emmons County Seat, the population of Winona declined and finally became nonexistent in the early 1940s.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Because of the dense vegetation on the island, it is managed as a natural area for the benefit of wildlife. Access is by boat with few visitors coming to the area for hunting and fishing. Although there are parties that do hunt on the island, there is relatively little that takes place because of the dense vegetation present.

Resource Objectives.

- Maintain a natural state on the island
- Provide interpretation of the local history of the area
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Provide bank stabilization along the west side
- Protect sensitive natural and cultural resources by limiting access
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Winona Island Natural Area is located along the upper portion of Lake Oahe. This site should be maintained as a natural area with no facility development. This strategy is in keeping with preserving the existing wildlife habitat and the history of the old town. Because of the unique nature of the island, a classification of Environmentally Sensitive is appropriate.

RIVERY WILDLIFE AREA

Management Unit. MU #048

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This management area extends from the Cattail Bay Recreation Area north to the mouth of Beaver Creek in Emmons County, North Dakota. Access to much of the area is limited to section line trails.

Description. The topography of the 1,124-acre Rivery Wildlife Area is varied. In the southern portion of the management area, there are rolling hills with short grass species, primarily blue grama and sideoats grama. In the area immediately north of Cattail Bay, there is a heavily wooded riparian area (cottonwood, willows, and Russian olive) with several wetland areas present. These wetland areas contain reed canary grass and cattails and support populations of beaver and muskrat.

The terrain changes in the northern portion of the management area. The area is characterized by more hills with more defined drainages. Grass species are mixed, with crested wheatgrass, blue grama, and brome the dominant species. Green ash, bur oak, cottonwood, and willow can be found in isolated stands along the shoreline and in some of the draws with understory species of plum and buffaloberry. Stands of foxtail barley grow along the hillsides in the interior portion of the many small embayments.

A variety of wildlife species inhabit this management area. The area provides habitat for white-tailed deer, pheasant, grouse, partridge, turkey, cottontails, jackrabbit, coyote, and fox. Many of the species use the adjacent agricultural land for cover and food. Little Beaver Bay supports populations of both fox and squirrel as well as nesting populations of wood ducks. There are great blue heron and cormorant rookeries located at the north end of Little Beaver Bay.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The main use of the area is for hunting and the area is therefore managed to provide wildlife habitat. Cottonwood, willow, and Russian olive trees have all been planted in this area to establish additional wildlife habitat and winter cover. Food plots have also been established to supplement the existing food supply for various wildlife species.

Several small developments are located on adjacent private land. The main developments are The Rivery Retreat Center, located two miles southwest of Little Beaver Creek; Walthers' subdivision, located on the southwest side of Beaver Creek; and Jennerville, located on the north side of Little Beaver Creek. Just west of the Rivery Retreat Center is the Jennerville low water boat ramp. Although there are few facilities on project land, all of these groups, as well as the general public, have ready access to the shoreline for fishing or hunting activities.

Resource Objectives.

- Maintain Jennerville low water boat ramp
- Upgrade the quality of habitat for upland species
- Stabilize the shoreline to prevent erosion
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Plant trees and shrubs to increase winter cover, woody vegetation, and food sources for wildlife
- Monitor erosion and potential encroachment
- Establish food plots to supplement native food sources for waterfowl, big game, and upland game species
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Rivery Wildlife Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees or shrubs and the establishment of food plots.

Special Site Conditions. During the Eisenhower administration, lands purchased for the construction of Lake Oahe were kept to a minimum. In some areas, this resulted in very little fee land remaining after the reservoir was filled. The Rivery Wildlife Area is located on a stretch of Lake Oahe that is exposed to heavy wave action. The soil in some portions of the area is composed of friable material and is easily eroded. Because of the very narrow takeline in portions of the Rivery area and the area's susceptibility to erosion, there are several locations where the lake is encroaching onto private land. Measures should be undertaken to counteract this encroachment through the stabilization of the eroding banks and/or the purchase of additional property.

SOUTH BEAVER CREEK RECREATION AREA

Management Unit. MU #049

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Corps of Engineers (area west of highway)
North Dakota Game and Fish Department (area east of highway)

Location. This recreation area extends along the south side of Beaver Creek from the mouth to just east of the ND Highway 1804 bridge in Emmons County, North Dakota. Access is by gravel roads leading both east and west from ND Highway 1804.

Description. This 126-acre area is characterized by rolling hills, moderate cutbanks, and a few drainages. Brome grass predominates but crested wheatgrass and buffalo grass can be found on the hilltops. Other non-woody vegetation includes prickly pear cactus, yucca, and pasqueflower. Woody vegetation is scattered on the hillsides and along the shoreline. In these areas, green ash, bur oak, cottonwood, and willow predominate with understories of buffaloberry and plum.

The developed facilities within this recreation area are limited to a single-lane boat ramp and vault toilet located east of ND Highway 1804. An NDGF Game Warden law enforcement building is located in that same area. There is a housing development on adjacent private land on the south of Beaver Creek.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the South Beaver Creek Recreation Area is low. Most of the visitors to this area participate in boating and fishing. The area does receive heavy use during peak periods of fishing, especially in the springtime, and relatively little use the remainder of the year.

Because there is no fee to use the boat ramp and because of the less crowded conditions, some visitors prefer to launch their boats from South Beaver Creek instead of the more heavily used Beaver Creek Recreation Area.

Resource Objectives.

- Provide lake access for boating and fishing
- Provide for day use activities
- Promote non-consumptive activities such as hiking, photography, and sightseeing
- Promote ecological integrity by controlling noxious weeds

- Preserve, monitor, and protect cultural resources
- Upgrade the quality of habitat for various wildlife species

Development Needs.

- Expand parking area near the boat ramp
- Provide fish cleaning table, picnic tables, grills, and shade shelters
- Install potable water
- Plant shoreline and woody draw vegetation where feasible to control erosion and to improve the overall aesthetic quality of the area
- Plant native grasses
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. This narrow recreation area has been developed to remove the day use pressure from the Beaver Creek Campground. As such, additional facilities such as picnic tables, grills, and shelters should be added to entice more visitors to the area. The organized development of facilities would lessen the potential negative impacts to area wildlife and habitat. This area supports a land use classification of Multiple Resource Management: Recreation - Low Density because of the limited facilities and the relatively limited area for expansion.

BEAVER CREEK WILDLIFE AREA

Management Unit. MU #050

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This management area is located on the eastern two-thirds of Beaver Creek Bay and extends from the NDGF law enforcement building around the bay to the eastern end of the Beaver Creek Recreation Area in Emmons County, North Dakota. Access is from ND Highway 1804.

Description. The topography of the 1,081-acre area is flat riparian bottomland with rolling hills in the upland areas. Grasses in the area include foxtail barley, brome, and crested wheatgrass with occasional stands of big bluestem. The bottomlands contain stands of cottonwood and willow with green ash and bur oak scattered in the draws. Scattered stands of buffaloberry, chokecherry, and plum are found throughout the Beaver Creek Wildlife Area.

The area is inhabited by significant populations of white-tailed deer and pheasant. Furbearers, such as fox, coyote, raccoon, beaver, muskrat, badger, and porcupine are also residents of the area. White pelicans and great blue herons frequently use the area for feeding. Hawks and bald eagles use the dead timber along the shoreline for roosting areas. Ducks and geese are found in the bay during spring and fall migrations with some nesting taking place.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Current management practices include the establishment of food plots using corn, milo, sunflower, and crops from adjacent agricultural fields. Dense nesting cover and woody vegetation have also been established to increase and improve wildlife habitat.

Recreation use of the area is wildlife related. Activities include hunting, wildlife and nature study, and photography. This area is also very popular for shoreline fishing.

In reaction to the drought which occurred in the late 1980s and early 1990s, in 1991 the North Dakota State Water Commission and the Emmons County Water Resource District entered into an agreement to investigate the feasibility of impounding water upstream from ND Highway 1804 at Beaver Bay. The goal of the impoundment project was to provide a stable water level that was not influenced by the fluctuating Lake Oahe water elevations. This more stable water level was to

enhance recreational opportunities in south-central North Dakota. A study by the North Dakota Water Commission is pending and stakeholders are investigating engineering options for a structure to provide recreational opportunities when Lake Oahe is low.

Resource Objectives.

- Upgrade the quality of habitat for a variety of wildlife species and fisheries thereby promoting hunting and fishing opportunities
- Promote non-consumptive uses of resources such as hiking, photography, and sightseeing
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Provide facilities/trails to promote non-consumptive uses of wildlife such as hiking, photography, and nature study
- Develop additional wetland areas for resident and migrating waterfowl;
- Establish food plots to supplement existing food sources for waterfowl, big game, and upland game species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Beaver Creek Wildlife Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees, shrubs, and food plots.

BEAVER CREEK RECREATION AREA

Management Unit. MU #051

Classification. Recreation

Management Agency. Corps of Engineers

Location. Beaver Creek Recreation Area is located along either side of ND Highway 1804 on the north side of Beaver Creek Bay. This Emmons County area is roughly 14 miles west of Linton, North Dakota.

Description. The topography of the 342-acre Beaver Creek Recreation Area is hilly with woody draws that gradually slope to the shoreline. A series of natural springs exist in the area east of ND Highway 1804. Vegetation in the recreation area consists of brome, crested wheatgrass, buffalo grass, and blue grama with yucca and prickly pear cactus on the hillsides. Green ash, bur oak, cottonwood, willow, chokecherry, snowberry, and plum are the predominant woody species. Several shelterbelt plantings have been established including large mature stands of pine and spruce that are already self-regenerating. A small food plot of sunflowers or corn is planted annually for wildlife.

The woody draws and shelterbelts provide year-around cover for white-tailed deer as well as cottontails, squirrels, raccoons, porcupine, skunk, coyote, fox, pheasant, and some turkey. Songbirds are plentiful. In fact, the Corps erected blue bird boxes in the early 1990s to attract more of these birds to the area.

The Beaver Creek Recreation Area is a fully developed camping area. Facilities west of the highway include a 3-lane boat ramp, a low water single lane boat ramp, courtesy docks, fish cleaning table, camping with and without electrical hookups, comfort station, vault toilets, potable water, grills, dump station, swim beach, picnic sites, playgrounds, picnic shelter, volleyball court, horseshoe pits, amphitheater, nature trail, and a Lewis and Clark interpretation sign. East of the highway facilities are limited to primitive camping areas, vault toilets, picnic tables, and hiking trails.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Beaver Creek Recreation Area is moderate to high when the fishing is good and the water is high. Most of the visitors originate from Linton, Bismarck, and other communities east of Lake Oahe. The fishing is marginal in times of low water elevation.

This area is used for both water-oriented and land-based recreation activities. The primary activities include fishing, boating, camping, swimming, and picnicking. More family groups and fishermen are being attracted to this area because of the number and quality of recreation facilities offered.

Fishing is very popular and important to the success of the Beaver Creek Recreation Area. Primary catches included walleye, northern pike, and white bass. However, at the present time, the only access to the boat ramp is through the campground. Conceptual plans have been developed to separate day-use and camping. Camping would remain west of Highway 1804. More electric sites would be added along with another comfort station. Day use would be on the east side of Highway 1804 and would include a pavilion, picnic shelter, swim beach, and comfort station on the northeast side of the creek and a huge boat ramp, parking lot, and comfort station on the southeast side.

In addition to its recreational aspect, Beaver Creek Recreation Area is also managed for wildlife species. Shelterbelts of Siberian elm, green ash, cottonwood, ponderosa pine, and caragana have been established. Upland game species have benefited from a program to increase the amount of dense nesting cover through plantings of chokecherry and plum thickets.

Resource Objectives.

- Provide lake access for fishing and boating
- Provide recreation facilities for day use activities and camping
- Provide the opportunity for general recreation and intensive facility development
- Promote non-consumptive uses of resources such as hiking, photography, and sightseeing
- Upgrade the quality of wildlife habitat for all wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop a comprehensive site plan for the area
- Provide separate day use and camping facilities
- Provide docks and small marina facility with fuel service
- Provide a boat dock for temporary or overnight docking
- Upgrade fish cleaning facilities
- Construct boat ramp east of the highway
- Improve internal circulation roads especially west of the main camping area and east of ND Highway 1804
- Develop an interpretive nature trail east of the highway
- Install group picnic shelters
- Install shade shelters and benches in the beach area
- Construct new comfort station with showers
- Improve camp pads and upgrade electrical hookups in campground

- Install interpretive signs
- Develop and maintain a group camping area west of the main campground
- Delineate camping sites in the area east of the highway
- Plant additional trees and shrubs for wildlife habitat and recreation aesthetics
- Provide potable water to meet demands of modern recreationists
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. Beaver Creek Recreation Area is one of the major camping and fishing areas on Lake Oahe. Local residents from Emmons and Burleigh Counties primarily use the area, although many visitors from all over the State use this recreation area as a primary destination area. The only North Dakota recreation area on Lake Oahe with a higher visitation figure is General Sibley Park near Bismarck and Kimball Bottoms.

The development of additional day use facilities and the interpretation of natural resources are among the top needs identified for this area. The separation of the day use and camping areas will increase the usability of the respective areas as well as providing a distinction between day use and camping use. Shifting the day use to the South Beaver Creek area would alleviate some of the heavy use at the existing boat ramp. Establishing vegetation in the campgrounds and day use areas will provide shade and shelter as well as other benefits to the visitors and resident wildlife.

Construction of limited marina facilities has been identified as a need for this recreation area. Even if campers are staying for an extended period of time, they must either take their boats out of the lake each night or beach them along the shoreline. Construction of boat slips would allow for temporary, overnight, or extended docking facilities. The Tribe has expressed an interest in having shuttle boats go from the Prairie Knights casino to this MU.

Because of its location on the lake, the Beaver Creek Recreation Area plays an important role in water-oriented recreation on Lake Oahe. Any development in this area would complement future development in the Pollock, South Dakota and Bismarck, North Dakota areas by offering limited supplies and fuel for those recreationists visiting the northern reaches of Lake Oahe.

The Beaver Creek Recreation Area supports a land use classification of Recreation because of the aesthetic qualities, suitable resources, and the diversity of the existing recreation facilities.

HORSEHEAD CREEK AREA

Management Unit. MU #052

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This area extends from Beaver Creek Recreation Area north approximately 18 miles to the Badger Bay Recreation Area in Emmons County, North Dakota. It also includes the former ND Game Management Area located east of the Badger Bay Recreation Area. Access is from ND Highway 1804.

Description. The terrain in this 2,350-acre area is varied. In the southern portion, the terrain is flat to gently rolling. Vegetation in this area is a combination of mixed grasses and woody draws. Crested wheatgrass and big bluestem predominate. Some of the drainages contain yucca and prickly pear cactus on the hillsides and bur oak occurs in the draws.

There are heavily wooded draws and more riparian areas in the northern areas. Willow, cottonwood, green ash, and oak predominate with understories of chokecherry, snowberry, and plum. There are some stands of leafy spurge in this area.

This unit provides habitat for both mule deer and white-tailed deer. Pheasant are the primary upland game bird although a few sharp-tailed grouse are present. Cottontails, jackrabbit, raccoon, beaver, porcupine, fox, coyote, and turkey are also plentiful. Bald eagles are known to roost in the southern portion of the area. Least terns and piping plovers nest in the northern part of the management area. This management area is a frequent feeding area for great blue herons. It is also a major spawning area of northern pike.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed to upgrade the habitat for upland game and big game species. This makes the area popular for hunting. Food plots are scattered throughout the area to supplement existing food sources.

A low water boat ramp was constructed in the southern portion of this unit approximately four miles north of the Beaver Creek Recreation Area. This boat ramp provides lake access during periods of low water. It is in the area of this lake access point that the proposed Fort Yates Bridge is to be constructed.

Resource Objectives.

- Upgrade the quality of habitat for upland species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop wetland areas in the many small embayments located within this management area
- Plant trees and shrubs to increase winter cover, woody vegetation, and food sources for wildlife
- Establish food plots to supplement existing food sources for area wildlife
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Horsehead Creek Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Although the takeline is very narrow, some of the area is suitable for additional wildlife plantings such as trees, shrubs, or small food plots.

BADGER BAY RECREATION AREA

Management Unit. MU #053

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Corps of Engineers

Location. The Badger Bay Recreation Area is located adjacent to ND Highway 1804 and extends one mile north to the Hazelton Recreation Area in Emmons County. The recreation area is roughly 30 miles southeast of Bismarck.

Description. The terrain of the 345-acre recreation area is relatively flat with high banks and severe cutbanks. Grass stands of brome with some crested wheatgrass predominate. Cottonwood and willow species are found in the riparian areas along the shoreline. In the small drainages along Badger Creek stands of cattails can be found with bur oak in the upland areas. Buffaloberry and snowberry can be found scattered in the area. A major shoal, Badger Shoal, has developed between the recreation area and the lake; thus access to the main portion of Lake Oahe is impossible.

Badger Bay Recreation Area provides habitat for white-tailed deer, cottontail, badger, beaver, fox, raccoon, porcupine, upland game birds (mostly pheasant), and turkey. White pelicans and heron also reside in the area. The recreation area supports high populations of birds. Among these are the red-headed woodpecker, bluebirds, yellow finch, sparrow, barn swallows, and bank swallows. Badger Bay is well known for its northern pike spawning.

Recreation facilities in the Badger Bay area are limited to camping areas and vault toilets.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. This recreation area receives low use. The lack of a boat ramp and attendant facilities contributes to this low use. Primitive camping is allowed in most portions of this recreation area. During the height of the summer recreation season, there are 30 to 40 camping units set up on most weekends with heavier use during high-use weekends.

The primary users of the Badger Bay Recreation Area are from Emmons and Burleigh Counties. The major activities are shoreline fishing. Northern pike is the primary catch with some perch, bluegill, and crappie also taken. Other activities include picnicking, camping, and bird watching. In the fall, hunters use the recreation area as a base camp while hunting in the nearby hills.

Resource Objectives.

- Provide lake access for shoreline fishing
- Provide opportunities for hunting
- Provide limited recreation facilities for day use activities and primitive camping
- Maintain and manage the vegetation to provide habitat for a variety of wildlife species
- Promote non-consumptive resource uses such as photography and sightseeing
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Delineate camping areas to eliminate the random use of the shoreline
- Install playground equipment
- Provide security lights and pay telephone as safety precautions
- Construct shade shelters
- Develop additional shoreline access fishing areas
- Place picnic tables in designated camping and day use areas
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Badger Bay Recreation Area has some potential for additional development. The organized development of limited facilities would lessen the potential negative impact on wildlife habitat in the area. As such, this area supports a land use classification of Multiple Resource Management: Recreation - Low Density.

HAZELTON RECREATION AREA

Management Unit. MU #054

Classification. Recreation

Management Agency. Corps of Engineers

Location. This Emmons County recreation area is adjacent to ND Highway 1804, approximately 13 miles west of the town of Hazelton. It is immediately north of the Badger Bay Recreation Area.

Description. The topography of the 116-acre Hazelton Recreation Area is varied. The southern portion of the recreation area containing the campground is a flat bluff with 30- to 50-foot cutbanks. There are some planted trees in the area, primarily Siberian elm and green ash. The camping area has some trees providing shade but the majority of the trees are near the edge of the cut bank and along a wildlife loop north of the campground. There are significant stands of leafy spurge in the campground area.

The northern end of the area is a steep draw with the boat ramp and adjacent parking lot in the center of the draw. This area is more heavily wooded with Siberian elm, cottonwood, willow, bur oak, green ash, and buffaloberry. A small intermittent drainage way is located south of the boat ramp.

The central portion of the management area is a high bluff with severe cutbanks. Woody vegetation in this area is nonexistent. Crested wheatgrass predominates with a mixture of other native grasses also in the area.

Wildlife in the area is numerous. White-tailed deer can be found in the camping area and along the lake. Pheasant and some grouse also inhabit the area. Raccoons, fox, cottontail, and other small furbearers are also seen in the area.

Recreation facilities in the campground include vault toilets, designated camp pads, picnic tables, and grills. The northern portion has a 2-lane boat ramp, courtesy dock, fish-cleaning table, paved parking lot, vault toilets, and security lights. An overflow parking area is located east of ND Highway 1804.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitor use of the Hazelton Recreation Area is moderate. Most of the visitors are from Emmons and Burleigh Counties. Fishermen are prominent during early spring and late fall

when fishing is at its peak. The primary catch is walleye with some northern pike taken in the spring. Fishing is done both from boats and from the shoreline. Although high banks may be a limiting factor, there is still demand for shoreline access in the area. Because hunting is not allowed in the area, the game population is high.

The campground receives moderate use. The campground users are usually either hunters who use the area as a base camp or fishermen coming from outside the local area. A local chapter of an RV group called Good Sam's Club has adopted this campground as their primary volunteer campground. They paint and repair the picnic tables on an as needed basis and installed posts for a horseshoe pit. They plan to partner with the Corps and provide in kind assistance with the installation of playground equipment. The Good Sam Club, Voices of Lake Oahe and Bis-Man Reel & Rec Club stakeholders have been advocates for electric plug-ins at the campsites, adequate safe parking at the boat ramp, dredging the boat ramp area and the feasibility of relocating the boat ramp.

There is a safety factor that exists in the boat ramp area. Because the ramp is located in a small valley, long-range visibility of vehicles that are turning into or out of that portion of the recreation area is difficult because of the curve on the highway. Safety concerns are being investigated in this area as a result of high traffic volume in this area. The sheriff's department has asked the Corps to look at alternatives to address the safety issues. The Corps and a group of state and local agencies and group are cooperating in an effort to come up with an overall plan for the area and are pursuing financial opportunities to implement a plan.

Resource Objectives.

- Provide lake access for boating and fishing
- Provide day use and camping opportunities for families and groups
- Preserve and maintain the wildlife habitat in the area
- Study potential relocation of boat ramp area to address safety, parking and boat access issues on water
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop a comprehensive site plan
- Install potable water, electricity, and playground in the campground
- Install waterborne comfort station and security light in the campground
- Construct walkway, stairs with landings, or other access between the campground and boat ramp
- Repair boat ramp and dredge channel around boar ramp for access to main river channel and provide waiting area for boats waiting to load or unload
- Develop universal access for shoreline fishing

- Upgrade fish cleaning facilites
- Develop shoreline access from the campground
- Replace and expand day use facilities including additional picnic tables, grills, and concrete floor picnic shelters
- Promote non-consumptive uses of natural resources such as hiking, sightseeing, and photography
- Plant additional trees and shrubs for wildlife habitat.
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Remove dead trees and plan new trees in the area north of the campground

Rationale. The Hazelton Recreation Area serves as a significant water access site to the northern portion of Lake Oahe. This area is used primarily by local residents from Emmons and Burleigh counties although many visitors come from other areas east of Lake Oahe. The proximity to the Bismarck and Mandan areas and the excellent spring and fall walleye fishing contributes to the area's popularity.

The Hazelton boat ramp receives very heavy use but the campground is under-used. Improving the camping facilities at Hazelton should accommodate increased use while protecting the natural resources. The campground would probably receive more use if there were a way to connect the boat ramp and campground that is entirely separate from ND Highway 1804.

A land use classification of Recreation is appropriate for the Hazelton Recreation Area because of its high visitation, proximity to an urban area, and potentially increasing value as an intensively managed area.

Special Site Conditions. During the Eisenhower administration, lands purchased for the construction of the Oahe project were kept to a minimum. In some areas, this resulted in very little fee land remaining after the reservoir was filled. The Hazelton Recreation Area is located on a stretch of Lake Oahe that is exposed to heavy wave action. The soil in some portions of the area is composed of friable material and is easily eroded. Because of the very narrow takeline north of the boat ramp and the area's susceptibility to erosion, there are several locations where the lake is encroaching onto private land. Measures should be undertaken to counteract this encroachment through the stabilization of the eroding banks and/or the acquisition of additional property.

CARLSON BOTTOM

Management Unit. MU #055

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. The Carlson Bottom area extends from the Hazelton Recreation Area to the second section line west from Highway 1804 on the Emmons/Burleigh county line. This management area contains the Carlson Bottom and Glencoe Slough in northwest Emmons County, North Dakota. Access to the area is limited to section line roads and trails.

Description. The topography of this 5,570-acre area is typical flat bottomland with some rolling hills in the upland areas away from the lake. The low elevations are primarily riparian areas with cottonwood and willows predominating. The upland areas contain stands of bur oak. Extensive areas of intermediate and tall grasses can be found in Carlson Bottom. Stands of brome, alfalfa, foxtail, and reed canary grass are located throughout the area. Leafy spurge, a noxious weed, is a problem in some areas.

There are significant numbers of wetlands in Carlson Bottom. These wetlands are regenerated by periodic flooding. Cattails are abundant in most of these areas; however, some wetlands are nearly choked off because of the density of the cattail stands.

Wildlife in this management area is abundant and diverse. Large populations of white-tailed deer and pheasant inhabit the area. Furbearers including rabbits, fox, coyote, skunk, raccoon, and beaver also reside in this area. Carlson Lake and Glencoe Slough are major staging areas for migrating geese and ducks. White pelicans can also be found in these water bodies. Eagles are known to roost in the dead standing timber in the bottomlands. Flooded standing timber also provides rookeries for both great blue herons and cormorants.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area, formerly managed by the NDGF, is managed for the benefit of the various wildlife species that inhabit the area. Food plots have been established. Natural stands of dense nesting cover provide protection and shelter for numerous species.

Visitation to the Carlson Bottom area is primarily for deer hunting with some waterfowl and pheasant hunting also occurring. Fishing is also popular in the early spring and late fall with

northern pike the principal catch with some walleye also taken out of Lake Oahe. In Carlson Lake and Wilde Lake, crappie and perch are the usual catches. These later two lakes also provide extensive ice fishing opportunities.

Resource Objectives.

- Provide high quality and diverse habitat for resident wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally-listed threatened and endangered species that may periodically use the area

Development Needs.

- Plant trees and shrubs to increase winter cover, woody vegetation, and food sources for wildlife
- Establish food plots to supplement existing food sources and waterfowl, big game, and upland game species
- Develop wetland habitat and habitat for threatened and endangered species
- Create a fuel reduction plan for fire prevention
- Create emergent sandbar habitat in this area to attract threatened and endangered species
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to Carlson Bottom because it serves as prime wildlife habitat and a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

MACLEAN/KIMBALL BOTTOMS

Management Unit. MU #056

Classification. Multiple Resource Management: Wildlife Management

Management Agency. North Dakota Game and Fish Department

Location. This area extends from Carlson Bottom north and west to the Kimball Recreation Area. Encompassing portions of both Emmons and Burleigh Counties, this management area is accessed by gravel and dirt roads leading from ND Highway 1804.

Description. This large, diverse area of approximately 9,698 acres is primarily flat river bottomland with some upland areas away from the river. The riparian areas are composed of mostly cottonwood and willow, while the upland areas contain significant stands of bur oak. Both areas have understory species of plum and scrub ash. Shelterbelts of Russian olive, green ash, and chokecherry have also been established. Herbaceous vegetation in the MacLean/Kimball Bottom Area is predominantly big bluestem and wheatgrass with foxtail, cattails, and reed canary grass in the wetland areas.

There are heavy stands of dead timber in certain areas. Some "lightning-strike" wildfires in past years have consumed significant amounts of dead or dying timber. Some stands have regenerated while in other areas the growth of woody vegetation has been severely inhibited.

Wildlife in this management area is plentiful. Large populations of white-tailed deer and pheasant inhabit the area. Furbearers including rabbits, squirrels, fox, coyote, skunk, raccoon, and beaver also reside in this area. White pelicans can also be found in these water bodies. Eagles are known to roost in the dead standing timber in the bottomlands. Flooded standing timber also provides rookeries for both great blue herons and cormorants. Northern pike spawn in the backwater areas and side channels of the main lake.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed for the benefit for a variety of wildlife species. Although a portion of this management area is leased for agricultural purposes, 30 percent of the crops are left standing for food plots. These plots include stands of corn, oats, wheat, and alfalfa. Russian olive removal has expanded over the past few years in this area and is being monitored by NDGF crews for infestations of Russian olive outside shelterbelts. Noxious weed control has also expanded to biological control for both leafy spurge and Canada thistle.

Ducks Unlimited has sponsored several wetland restoration projects in the area in cooperation with the NDGF and the Corps. All of these projects have increased the amount of wetland habitat available. Ducks and geese congregate in these wetland areas, especially during migration periods.

There are several minor lake access points within this management area. One of these access areas is leased by Burleigh County. These areas offer access to Lake Oahe as well as spaces for primitive camping. There is both a rifle range and a pistol range also located in this management area. The pistol range is being relocated to the rifle range to increase the maintenance efficiency. A lead reclamation plan was put into place in 2008 to remove lead from both the pistol and rifle ranges. This is scheduled to be complete every 5-8 years.

Because of the availability of game, this area receives extensive hunting pressure. Deer and pheasant are both highly sought-after species. Considerable fishing, both from boats and the shoreline, takes place within this management area. Northern pike and walleye are the primary catch. Other activities in the area include sightseeing, photography, hiking, rifle and pistol shooting, and camping.

Resource Objectives.

- Provide high quality and diverse vegetation resources to provide food and shelter for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Develop additional wetland habitats
- Plant trees and shrubs to replace those areas destroyed during fires in order to increase winter cover, woody vegetation and food sources for wildlife
- Develop a systematic burn plan to enhance the area and prevent catastrophic wildfires
- Establish food plots to supplement existing food sources for waterfowl, big game, and upland game species
- Develop and implement fire reduction plan through vegetation management
- Create a National Rifle Association-approved plan for the rifle range
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the MacLean/Kimball Bottom Area because it serves as prime habitat

and a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees, shrubs, and food plots.

Special site condition. Because of the large quantity of fuel this area produces, it has caught on fire numerous times throughout the years. Two major fires costing up to $30,000 each in fire containment have occurred, the last being in 2003.

MACLEAN BOTTOM RECREATION AREA

Management Unit. MU #057

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Burleigh County Parks subleases this area through an agreement to operate and maintain the boat ramp area facilities with North Dakota Game and Fish

Location. The recreation area is located approximately 13 miles south of Bismarck in Burleigh County, North Dakota. Access to the area is by paved road leading south from ND Highway 1804.

Description. The developed recreation facilities within this 3-acre area are limited and include a 2-lane concrete boat ramp, security light, courtesy dock, floating dock for loading and unloading, large paved vehicle/boat trailer parking lot, vault toilets and 4 one-picnic table shelters. There is one isolated concrete picnic table located on the north end of the area between the parking lot and rip-rapped shoreline.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. The main use of the Maclean Bottom Recreation Area is mostly water-oriented recreation activities. This moderately used area accounted for roughly 2.2 percent of the total project visitation in 2005.

Fishermen are prominent during early spring and late fall when fishing is at its peak. During the summer months, the major recreational use of the area is camping, picnicking, boating and fishing. Shoreline fishing is also popular, with walleye, northern pike and catfish the major catches.

Resource Objectives.

- Provide lake access for boating and fishing
- Provide day use and camping opportunities
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.

Development Needs.

- Provide separate day use and camping facilities or keep camping confined to Oahe Game Management Area

- Delineate specific camp pads
- Perform a feasibility study on relocating the boat ramp so it would be parallel with the flow of the river to be more user friendly and safer for boaters
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. This area receives considerable use from residents of central, south central and eastern North Dakota. Since this area is surrounded by the Oahe Game Management Area it supports a land use classification of Multiple Resource Management: Recreation-Low Density.

KIMBALL BOTTOM RECREATION AREA

Management Unit. MU #058

Classification. Recreation

Management Agency. Burleigh County Park Board (leased recreation area);
Corps of Engineers (ORV area)

Location. This recreation area is located approximately seven miles south of Bismarck in Burleigh County, North Dakota. The recreation area encompasses the western portion of Kimball Bottom. Access to the area is by paved road leading south from ND Highway 1804.

Description. This 474-acre Burleigh County area can be divided into two parts. In the campground area in the north, the terrain is flat with some small-to-moderate cutbanks. Bottomland hardwoods, primarily cottonwood, predominate. Scattered stands of mixed grasses are found with noxious weeds. The southern portion of this management area is the location of the off-road vehicle (ORV) area and a stretch of beach locally known as "The Desert." These areas are both flat and sandy. The southern portion of this area grades from a beach up to a relatively old cottonwood stand. The management area provides wildlife habitat for white-tailed deer, turkeys, and raccoon. Some shoreline areas are suitable habitat for the endangered least tern and threatened piping plover.

There are developed facilities in the Kimball Bottom Recreation Area. Facilities in the northern portion are managed by the Burleigh County Park Board and include a 2-lane boat ramp, courtesy dock, vault toilets, picnic sites, and camping area. The ORV area, managed by the Corps of Engineers, is located in the southern end of the area. This ORV area contains approximately five miles of trails but no developed facilities with one set of vault toilets on the road to the sandbar. There is a mile of gravel road in addition to access roads.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. This area receives heavy use. The main uses of the Kimball Recreation Area include both water-oriented and land-based recreation activities. Fishermen are prominent during early spring and late fall when fishing is at its peak. During the summer months, the major recreational use of the area is camping, picnicking, boating, and fishing. Shoreline fishing is also popular, with walleye, northern pike, and catfish the major catches.

The ORV area receives considerable use year-round. Several rallies are held in the area each year. From March through October, the ND National Guard units use portions of the Kimball Bottom

Recreation Area as training grounds for various field exercises. Stakeholders have developed a vested interest in keeping the area an OHV area by helping clean and plant trees during special events held in the Fall. Burleigh County Parks, NDPRD and OHV groups are currently developing a master plan for an OHV trail system through Burleigh County. The plan includes access to the Kimball Bottom Recreation Area.

"The Desert" is extremely popular in the summer with young adults. Its clean white sand makes this an ideal area for various beach and water activities. These include fishing, swimming, ORV racing, and jet skiing.

Resource Objectives.

- Provide lake access for boating and fishing
- Provide day use and camping opportunities
- Preserve and maintain the wildlife habitat
- Further objective needs will be created with Kimball Bottoms stakeholders such as Burleigh County and ATV groups
- Create an ORV management plan
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.

Development Needs.

- Provide separate day use and camping facilities
- Delineate specific camp pads
- Provide access to potable water and electricity
- Install security lights and telephone at the boat ramp
- Provide additional picnic tables and shade shelters in both the day use and camping areas
- Provide playground facilities in the campground and day use areas
- Plant trees and shrubs to provide shade and to separate individual camping sites
- Improve internal circulation roads
- Improve the signage along the access road
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Develop OHV utilization plan for protection of environmental features and reduction of impacts.

Rationale. The Kimball Bottom Recreation Area is one of the major regional recreation areas in the northern third of Lake Oahe. This area receives considerable use from residents of central and eastern North Dakota. The easily accessible shoreline makes it attractive for water-oriented recreational activities. The variety of land-based resources also contributes to the area's appeal. Constructing separate facilities for the day use and camping areas will increase the usability

of the respective areas as well as providing a distinction between day use and camping use. Establishing vegetation in the campgrounds and day use areas will provide shade and shelter, as well as other benefits to the visitors and resident wildlife. The Kimball Bottom Recreation Area supports a land use classification of Recreation because of the aesthetic qualities, suitable resources, and the diversity of the existing recreational facilities.

APPLE CREEK WILDLIFE AREA

Management Unit. MU #059

Classification. Multiple Resource Management: Wildlife Management

Management Agency. North Dakota Game and Fish Department

Location. This management area extends from the Kimball Bottom Recreation Area to the northern contiguous boundary of the Oahe Project in Burleigh County, North Dakota. This area is located approximately 4 miles southwest of ND Highway 1804. Access to the area is limited to dirt roads that become impassible when wet.

Description. The topography of this 970-acre area is characterized as flat bottomland. Native hardwoods such as cottonwood, bur oak, and green ash make up the majority of the vegetation of this area. There are small areas of native prairie grasses scattered throughout the area. These grasses include little bluestem, wheatgrass, and switchgrass.

Apple Creek runs through the middle of this management area. Riparian vegetation is present along Apple Creek and includes cottonwood and willow species with vast cattail stands. Because of the low elevation in the southern portion of the management area, several areas along Apple Creek are flooded during times of spring snowmelt or heavy runoff events. The mouth of Apple Creek has historically been an area for walleye spawning while areas within Apple Creek are used by northern pike for spawning.

This area provides yearlong habitat for white-tailed deer, rabbits, raccoon, squirrel, fox, coyote, turkey, muskrat, beaver, pheasant, and a variety of songbirds. Ducks and geese use this management area as a nesting and staging area during spring and fall migrations.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The area is managed to provide wildlife habitat and receives considerable hunting pressure. Deer hunting is restricted to pistol, shotgun, or black powder. Fishing, especially for walleye and northern pike, is also moderate during the spring and fall. Other activities in the area include bird watching and photography.

There are some stands of leafy spurge present in the Apple Creek area. Control measures undertaken include the release of flea beetles to prevent further seed production. This process is slow but progress in controlling this noxious weed is becoming evident.

Resource Objectives.

- Provide and maintain high quality and diverse vegetative resources for area wildlife
- Provide wetland habitat for a variety of waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect cultural resources

Development Needs.

- Develop additional wetland area for resident and migrating waterfowl
- Maintain food plots to supplement the existing wildlife food supply
- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Protect natural resources from impacts from visitor use and ORV use
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. This area is not easily accessible and, as such, provides a "remote site" recreational experience for the Bismarck/Mandan area. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Apple Creek Area because it serves as prime habitat and a travel corridor for wildlife moving between upland areas and Lake Oahe. Parts of the area are suitable for additional wildlife plantings such as trees, shrubs, and food plots.

SIBLEY NATURE PARK

Management Unit. MU #060

Classification. Environmentally Sensitive

Management Agency. City of Bismarck
Sakakawea Girl Scout Council (Camp Neche)

Location. Sibley Nature Park is located approximately five miles south of Bismarck, North Dakota in Burleigh County. It is accessible by a 2-mile long paved county road leading from ND Highway 1804.

Description. The terrain of this 125-acre area is flat. The area is heavily wooded and is vegetated primarily by mixed hardwoods such as green ash, bur oak, and cottonwood. The park has a thick understory of various woody shrubs and plants such as dogwood, chokecherry, and wild rose.

A variety of wildlife species inhabit this quiet and secluded area. White-tailed deer, raccoon, squirrel, great-horned owls, barn owls, beaver, muskrat, and turkey all reside in the area. Woodpeckers and numerous songbirds also make their home in the nature park; among these are bluebirds, finch, black-capped chickadees, robins, and wrens. Wood ducks nest in hollow tree cavities during the spring and summer.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The area is used year-round by local residents as a place to find quiet and solitude. Bird watching, photography, cross-county skiing, and hiking along the 3/4-mile nature trail are the most popular activities.

The Sakakawea Girl Scout Council leases a portion of this park (Camp Neche) for education and camping programs.

Resource Objectives.

- Control shoreline erosion
- Provide resource-oriented development
- Manage the vegetative resources for the benefit of a variety of wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Provide day-use and camping facilities at Camp Neche

Development Needs.

- Construct a bridge over the ravine along the trail
- Provide a security light in the parking lot
- Install vault toilet near the trail head
- Provide boundary monumentation and markers to delineate the project boundary and protect against encroachments
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Provide additional camping areas and upgrade facilities at Camp Neche

Rationale. The Sibley Natural Area is located along the upper portion of Lake Oahe. This site should be maintained as a natural area with limited facility development. This strategy is in keeping with the Environmentally Sensitive classification of preserving the existing wildlife habitat. Minimizing development and delineating the project boundary to avoid encroachments will lessen the potential negative impact to wildlife habitat and will retain the natural state of the area. A classification of Environmentally Sensitive is appropriate because of the unique nature of this area and because it has one of the few remaining stands of bottomland forest in North Dakota along the Missouri River basin.

Special Site Conditions. Encroachments into the park are a major problem because of the inadequate definition of the project boundary in this area. Adjacent lands are being used to build houses along the riverfront and land is at a premium. As a result, many developers and/or homeowners are now encroaching onto Federal land for additional development space or expansions of private amenities and landscaping.

GENERAL SIBLEY PARK

Management Unit. MU #061

Classification. Recreation

Management Agency. City of Bismarck

Location. General Sibley Park is located on County Road 10 (also known as Washington Avenue), 4 miles south of Bismarck in Burleigh County, North Dakota. General Sibley Park is the northernmost project land on Lake Oahe.

Description. The terrain of General Sibley Park is typical bottomland floodplain. The 300-acre area consists of mainly cottonwood and willow in the campground and along the shoreline. There is a limited understory of dogwood and plum with small areas of chokecherry. Mixed grasses, predominantly brome and quack grass comprise the balance of the vegetative cover. There are significant stands of leafy spurge in this recreation area.

Wildlife residing in the area is limited to the small furbearers such as squirrel, rabbit, and raccoon. White-tailed deer are sometimes seen wandering through the area at night on their way to water. Songbirds are also numerous.

General Sibley Park is a fully developed recreation area with a wide variety of facilities. There are three loops in the recreation area - each corresponding to different uses. The southern-most loop is devoted to day use. Facilities include picnic tables, shade shelters, group shelter, potable water, vault toilets, playground, and a 2-lane boat ramp. There is also a small nature trail that meanders from the picnicking area to the boat ramp and back.

The middle loop is for camping with recreational vehicles (RV's) or pop-up camp trailers. Facilities in this loop include comfort stations, dump station, potable water, playground, horseshoe pits, and designated campsites with electricity. A small nature trail also exists in the north-central portion of this area.

The northern loop has been set aside for tent campers. The camping areas are not well delineated with the only facilities being vault toilets. The administrative offices are located at the western edge of this area just outside the camping loop.

The CRMP has identified no cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Visitation at General Sibley Park is moderate-to-high. Many of the visitors originate from Bismarck, Mandan, and other area communities. The park use is seasonal with the majority of the visitation occurring during the summer. The campground is usually full most summer weekends and occasionally during the week.

The major activity enjoyed in General Sibley Park is camping and picnicking. Many businesses from the Bismarck area hold company picnics at the park, highlighting a need for additional group picnic shelters. Shoreline fishing is also enjoyed in the area. However, because the river channel is currently along the opposite bank, boating is sometimes difficult. The major catches taken from Lake Oahe in this area include walleye, northern pike, catfish, and bullhead. Other summer activities include hiking, photography, and Frisbee golf.

Although winter activities do not approach the summer participation rates, the park is used year-round by outdoor enthusiasts. Winter activities include cross-country skiing, walking, and photography.

Resource Objectives.

- Recognize the significance of both water-oriented and land-based activities
- Provide water access for boating and fishing
- Provide opportunities for diverse day use activities
- Provide the opportunity for a pedestrian and bicycling trail network
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop a comprehensive site plan for the area
- Install a fish cleaning table to support fishing in the area
- Expand and improve the lake access and fishing facilities including additional car/trailer parking, courtesy dock, and boat slips (for overnight use)
- Construct additional group picnic shelters in the day use area and camping areas
- Construct additional playground facilities in the campground
- Expand and improve the two nature trails within the park
- Construct a hiking/biking trail leading through the recreation area then north into Bismarck
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The General Sibley Park will remain a major recreation area because of its proximity to the city of Bismarck. Access to the area is excellent. The continued operation and development of the park will ensure that it remains one of the most heavily used recreation areas in the North Dakota segment of Lake Oahe. This area receives considerable use from residents of

Bismarck, Mandan, as well as other area residents. A revised comprehensive site plan could provide for a higher level of usage. The organized development of additional facilities will lessen the potential negative impacts on area vegetation and wildlife. Because of its urban setting, high visitation, accessibility, and extensive development, General Sibley Park supports a land use classification of Recreation.

SCHMIDT/GRANER BOTTOMS

Management Unit. MU #062

Classification. Multiple Resource Management: Wildlife Management

Management Agency. North Dakota Game and Fish Department

Location. The Schmidt/Graner Bottoms area is located in Morton County approximately 10 miles south of Mandan, North Dakota. This area is in the extreme northern portion of the Oahe project located on the west side of the lake. The area extends from the northern boundary south to the Huff Village Area but excludes both the Little Heart and the Graner Park Recreation Areas. Access is by several minimum maintenance roads and dirt trails leading from ND Highway 1806.

Description. The topography of this 5,591-acre management area is flat river bottomland. There are large forested areas of primarily cottonwood with willow along the shoreline. In addition, there are small stands of bur oak on the small side slopes. Portions of this area that were leased for agricultural purposes provided supplemental food sources for area wildlife. However NDGF has been reducing the amount of farmland and converting cropland into herbaceous cover for ground nesting birds and upland hunting opportunities.

The heavily wooded bottomlands along the lake are home to a variety of wildlife species. White-tailed deer are numerous. Upland game species include pheasant with a few sharp-tailed grouse. Cottontail rabbits, squirrels, raccoon, porcupine, and turkey also reside here. Beaver and muskrat make their homes in the many small embayments in the area. These embayments also receive considerable use by migrating waterfowl during the spring and fall. Numerous shorebirds reside in the area because of the location of adjacent sandbars and the sandy nature of the shoreline. These include killdeer as well as the federally endangered least tern and the threatened piping plover.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The area is managed to improve the quality of habitat for wildlife species by maintaining woody vegetation and winter cover and providing a supplemental food source. Several shelterbelt plantings have been established within the Schmidt/Graner Bottom Area. As mentioned earlier, portions of cropland are left standing for an additional food source. The cropland left standing have attracted numerous waterfowl species during spring and fall migrations, making this a prime waterfowl hunting location.

This area receives considerable hunting pressure for big game species, as well as some upland game and waterfowl. There is a small rifle range owned by NDGF and leased to the Mandan Park Board and is located adjacent to project land near the Little Heart Recreation Area. This area is heavily used just before and during hunting season for sighting-in rifles, target practice, and skeet shooting.

This management area is also popular for shoreline fishing because of its easy access and proximity to the Little Heart and Graner Park Recreation Areas. Other activities include sightseeing, photography, and hiking.

Resource Objectives.

- Upgrade the quality of habitat for big game, upland game, and waterfowl species
- Protect any State or federally listed threatened and endangered species that may periodically use the area
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Monitor and maintain the vegetative resources to ensure the continued survival of the bottomland forest
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Schmidt/Graner Bottoms Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees, shrubs or food plots. Compatible recreation opportunities based upon the resources present are also supported.

LITTLE HEART RECREATION AREA

Management Unit. MU #063

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. North Dakota Game and Fish Department (wildlife area),
Morton County Park Board (boat ramp),
Corps of Engineers (shoreline fishing area)

Location. The Little Heart Recreation Area is located approximately 12 miles south of Mandan on the west side of Lake Oahe in Morton County, North Dakota. Access is by a 1.5-mile long paved road leading northeast from ND Highway 1806 to the boat ramp. The remainder of the road is a gravel road leading to shoreline fishing access and a wildlife area.

Description. Terrain of the 73-acre Little Heart Recreation Area is flat floodplain with significant stands of cottonwood, willow, and green ash. Herbaceous vegetation within this management area is primarily a mixture of native grasses. Significant amounts of leafy spurge are present throughout the recreation area.

Wildlife species inhabiting the area include white-tailed deer, pheasant, turkey, beaver, muskrat, rabbit, and many songbirds. Adjacent land use is primarily cropland. As a result, many of these species are attracted to the standing crops as an alternate food source.

The developed recreation facilities within this area are limited and include a 2-lane boat ramp, courtesy dock, and vault toilet.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Little Heart Recreation Area is considered to be low. Most of the visitors to this area are from Mandan, Bismarck, or other communities within Morton and Burleigh Counties.

Fishing is the major activity undertaken in this recreation area. Although seasonal, many visitors come for the excellent walleye fishing in the early spring and late fall. Many people fish along the shoreline as well as from boats. Hunting opportunities also abound. The plentiful deer and pheasant populations on adjacent lands almost assure hunters of bagging their game. Many recreationists use the Little Heart Recreation Area as a base camp for hunting on adjacent lands.

Although a problem in the past, ORV use has been completely restricted from this area, including main roads.

Resource Objectives.

- Provide lake access for boating and fishing
- Provide access for hunting on adjacent lands
- Maintain and improve the quality of habitat for wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resource

Development Needs.

- Install a security light at the ramp
- Provide a larger turnaround and parking lot at the boat ramp
- Install telephone and security light near the boat ramp as safety precautions
- Improve all internal circulation roads and signs
- Develop a conceptual plan including the partnership of Morton County Park Board and NDGF for camping use in this area
- Relocate a portion of the main gravel access road near the cutbank to alleviate safety concerns
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Little Heart Recreation Area has some potential for additional development. The organized development of limited facilities would lessen the potential negative impact on wildlife habitat in the area. As such, this area supports a land use classification of Multiple Resource Management: Recreation - Low Density.

GRANER PARK RECREATION AREA

Management Unit. MU 064

Classification. Recreation

Management Agency. Morton County Park Board

Location. The Graner Park Recreation Area (formerly known as the Sugarloaf Recreation Area) is located approximately 16 miles south of Mandan, North Dakota. Access to the recreation area is by a 1-mile paved road leading from ND Highway 1806.

Description. The topography of this 45-acre recreation area is relatively flat with moderate cutbanks. Grass species present consist of brome and fescue. Cottonwood, willow, hackberry, and Russian olive trees can be found in the campgrounds and along the shoreline. An understory of buffaloberry and dogwood is found in association with other woody vegetation. Some cedars and spruce trees have been planted in the area.

Also inhabiting the area are raccoon, squirrel, rabbit, and a variety of songbirds. Beaver can often be seen in the small constructed embayment within the recreation area.

The recreation area is divided into three units - the boat ramp and day use area in the center surrounded by the two camping areas. The center unit contains a 2-lane boat ramp, courtesy dock, floating loading dock, fish cleaning table, vault toilets, dump station, picnic sites, picnic shelter, and playground. The camping areas have facilities including picnic tables, grill, designated campsites, and vault toilets. The western camping area has electric pedestals at each site and the eastern camping area is primitive.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. The Graner Park Recreation Area is the most widely used recreation area located on the west shore of Lake Oahe in North Dakota. This recreation area receives moderate use and accounted for 3.9 percent of the total project visitation for 2005.

The primary activity in which visitors participate is fishing. The excellent walleye fishing in the area in early spring and late fall draw considerable numbers of visitors from the Mandan and Bismarck areas. During the summer, several business and family groups use the picnic shelter in the day use area for their annual picnic. Hunting is also enjoyed on adjacent lands, especially in the fall. The nearby wooded bottomlands are home to numerous deer while many pheasant reside in the adjacent

cropland. Visitors also participate in camping, bird watching, and photography in this recreation area.

Resource Objectives.

- Provide lake access for boating and fishing
- Provide access for hunting on adjacent project lands
- Provide recreation facilities for day use activities and primitive camping
- Promote non-consumptive resource uses such as hiking, photography, and sightseeing
- Maintain and manage the existing vegetation to provide habitat for upland game birds, big game, and other wildlife species
- Protect any State or federally listed threatened and endangered species that may periodically use the area
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Install comfort station with running water and showers
- Install playground equipment in each of the camping loops
- Install multi-purpose activity court in the day use area
- Riprap severely eroding cut bank on eastern end of recreation area
- Expand parking facilities for the day use area
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. This attractive area provides excellent opportunities for lakeside recreation. The easily accessible shoreline makes it attractive for water-oriented recreational activities. The variety of land-based resources also contributes to the area's appeal. Additional facilities would provide a greater variety and increased use. Because of its location on the lake, the Graner Park Recreation Area plays an important role in water-oriented recreation of Lake Oahe. Any development in this area would complement future development in other reaches of the lake. The organized development of facilities would lessen the potential negative impact on wildlife habitat in the area. This area supports a land use classification of Recreation because of the aesthetic qualities, suitable resources, and the diversity of the existing recreational facilities.

HUFF VILLAGE AREA

Management Unit. MU #065

Classification. Environmentally Sensitive

Management Agency. Corps of Engineers

Location. The Huff Village Site is located approximately 20 miles south of Mandan, North Dakota. Access to this area is by dirt roads leading from ND Highway 1806.

Description. The 112-acre Huff Village Area is a very narrow segment of project land that is characterized by flat lands with some moderate cutbanks. Vegetation in the area is mixed grasses. Cottonwood and willow species may be found along the shoreline.

Wildlife in this management area includes pheasant and rabbit, with occasional deer, raccoon, fox, and coyote wandering through the area to access the lake.

Prior to the Euro-American settlement in the 1900s, this general area was the location of several Plains Indian earth lodge villages. The old town of Huff was located near this management area and was named after John Huff, an early settler. Many immigrants moved into Huff in the early 1900s. The town reached its height between 1910 and 1915, after which the population declined.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Visitation to this area is usually very low. This area is managed to maintain the cultural resources present. In addition, there is management of the area for the benefit of wildlife species. This use is seasonal and coincides with early spring and late fall walleye fishing. As a result, there is considerable shoreline fishing at these times.

Resource Objectives.

- Develop a sustainable habitat of native species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Sustain vegetation for upland and big game species
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. This area had significant settlement by both Plains Indians and Euro-Americans. The unique historical character of this area makes Environmentally Sensitive an appropriate land classification for the Huff Village Area.

Special Site Conditions. During the Eisenhower administration, lands purchased for the construction of the Oahe project were kept to a minimum. In some areas, this resulted in very little fee land remaining after the reservoir was filled. The Huff Area is located on a stretch of Lake Oahe that is exposed to heavy wave action and, as a result, severe erosion. Because of the very narrow takeline and the area's susceptibility to erosion, there are several areas where the lake is encroaching onto private land. Although an flowage easement for a portion of this area does exist, measures should be undertaken to counteract this encroachment through the stabilization of the eroding banks and/or the acquisition of additional property.

ECKROTH BOTTOM AREA

Management Unit. MU #066

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This area extends from the Huff Village Area south to the Fort Rice Recreation Area in Morton County, North Dakota. Access to this management area is by dirt or gravel roads leading from ND Highway 1806.

Description. The topography of the 3,475-acre Eckroth Bottom Area varies. In the northern portion of this management area, the terrain is flat river bottomland/floodplain with an easily accessible shoreline. There is some agricultural use, primarily the raising of corn and alfalfa. The southern portion of this area is hilly with definite draws and some severe cutbanks.

Mixed grasses, primarily brome and alfalfa, are found throughout the management area. Little bluestem may be found on the side slopes of some draws. Significant stands of leafy spurge are also present. There are scattered stands of oak, hackberry, and chokecherry in the draws while cottonwood and willow are located along the shoreline. The extreme southern portion of this management area lies along Rice Creek. Vegetation in this area is typically riparian with cottonwood and willows in isolated stands along the creek.

Wildlife present in this management area varies with the terrain. In the heavily wooded area in the north, white-tailed deer are plentiful. In the draws and hilly country of the south, more mule deer reside. Pheasant reside throughout the area with occasional sharp-tailed grouse also found. Bald eagles have been observed using dead standing timber in the lake as resting perches during periods of migration. This use coincides with the spring and fall migrations of waterfowl.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed to improve wildlife habitat. Trees such as cottonwood, green ash, and red cedar have been planted to increase the amount of woody vegetation. Adjacent farmlands and Corps leased food plots provide a food source for wildlife in the area. The adjacent former State rest area has been relinquished to the Morton County Parks Department and has been reopened as a recreation area that includes campsites with electricity. Another access to the shore for shore fishing was accomplished through a license to Morton County Park Board and NDGF. This

parking area was an essential access for historic shore fishing. The area was protected through this partnership.

Recreational use of the area consists of big game and upland game hunting. Walleye fishing is also popular - both by boat and along the shoreline.

The Fort Rice State Historical Site is located at the southern end of this management area and is operated by State Historical Society. This area receives extremely low visitation.

Resource Objectives.

- Upgrade the quality of habitat for wildlife species
- Develop a relationship with the State Historical Society to manage the prairie dogs that are compromising the Ft. Rice Historic site and are encroaching onto this area
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Plant additional trees, where feasible, to increase the amount of woody vegetation and winter cover
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Eckroth Bottom Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Much of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

FORT RICE RECREATION AREA

Management Unit. MU #067

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Morton County Park Board

Location. The Fort Rice Recreation Area is located in Morton County, North Dakota approximately 25 miles south of Mandan. The recreation area lies on the south side of Rice Creek and extends from ND Highway 1806 east to the water's edge. Access to the recreation area is via a paved road leading from ND Highway 1806.

Description. The topography of this 139-acre area is relatively flat with moderate to severe cutbanks. Predominant grass species include brome, big bluestem, wheatgrass, and leafy spurge. Woody vegetation, such as green ash and bur oak, is limited to the draws. Plum, buffaloberry, and chokecherry thickets are scattered throughout the area.

There are occasional sightings of white-tailed deer and pheasants. Small furbearers can be found wandering through this management area. These include coyote, fox, raccoon, and skunk.

The recreation area lies in the same general area as the original Fort Rice. Fort Rice was named after General Clay Rice who was killed in May 1864 at the Battle of the Wilderness. The fort was built in 1864 and was the first military fort built on the Upper Missouri River. It was rebuilt in 1874 after a fire had destroyed most of the original structures. The fort was finally abandoned in 1879. The actual site of the fort was made into a historic site (on lands now adjacent to the project) and a replica of the fort, since destroyed, was built by Works Progress Administration in the 1930s.

Recreational facilities in the area include a 2-lane high-water boat ramp, an unimproved low-water boat ramp, courtesy dock, fish cleaning grinder, vault toilet, picnic sites, and primitive camping area. There is also a security light at the boat ramp that has been added as a safety feature.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Fort Rice Recreation Area is low. Most of the visitors to the area come from Morton and Burleigh Counties.

Fishing, both by boat and shoreline, is the major activity undertaken in the area with walleye and some northern pike being the primary catches. When fishing is good, the parking lot near the ramp is

often filled to capacity with the remaining visitors parking on grassy areas nearby or in the campground. This recreation facility also receives some use for primitive camping, hiking, and hunting.

Resource Objectives.

- Provide lake access for boating, fishing, and hunting
- Provide minimum recreation opportunities for day use and primitive camping
- Upgrade the quality of habitat for upland game and other wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect cultural resources

Development Needs.

- Develop a comprehensive site plan for the Fort Rice Recreation Area
- Develop a camping area with designated pads, grills, and picnic tables
- Plant trees, food plots, and native grasses for wildlife food supply
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Fort Rice Recreation Area is one of the few developed access points on the west side of Lake Oahe. Although developed for day use and limited primitive camping, the area primarily attracts fishermen and residents from Morton and Burleigh Counties. Because the area is adjacent to Rice Creek, it offers a diversity of habitat that is highly valuable to wildlife. Development should be directed toward maintaining a diversity of wildlife habitat. The organized development of facilities would lessen the potential negative impact on wildlife habitat in the area.

Because of the lack of development on the west side of Lake Oahe and because adequate land resources are present, this site could be considered for additional development. A comprehensive site plan should be developed for this area in order to prevent random, dispersed development. A land use classification of Multiple Resource Management: Recreation - Low Density is appropriate for this recreation area.

CANNONBALL NORTH AREA

Management Unit. MU #068

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This management area extends from the Fort Rice Recreation Area south to the Cannonball River and includes all project land on the north side of the Cannonball River in Morton County, North Dakota. Access to the area is extremely limited. The northern access is from the Fort Rice Recreation Area while the southern access is from ND Highway 1806. .

Description. The topography of this 1,479-acre area is hilly with steep cutbanks north of the Cannonball River - some as much as 100 feet high. There are some smaller drainages in the southern portion of the management area with hardwoods such as oak and cottonwood the predominant species. Mixed native grasses are found throughout the area with some patches of leafy spurge. In addition, there are small isolated chokecherry thickets scattered throughout this management area.

Pheasant, partridge, and sharp-tailed grouse are known to frequent this area because of the extensive rangeland. White-tailed deer and mule deer also inhabit some of the draws. Both cottontail rabbits and jackrabbits reside in the area, as do porcupine, fox, bobcat, and coyote. Some pronghorns that reside on lands adjacent to project lands are known to use this area on occasion. In the areas around the Cannonball River, cormorants, pelicans, great blue herons, and bald eagles are present during various times of the year.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Cannonball North Area is managed for the benefit of a variety of wildlife species. Some tree plantings have been attempted; however, these have been only marginally successful because of the lack of moisture and poor soil types. Because the project lands are not fenced, cattle roam into the area. In order to encourage the growth of native grasses, grazing restrictions have been attempted with only limited success.

In those areas that are accessible, fishing and hunting are the main recreational activities in which visitors participate.

Resource Objectives.

- Upgrade the quality of habitat for wildlife species

- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Plant warm and cool season grasses to increase dense nesting cover
- Establish food plots, where feasible, to supplement the existing food sources for wildlife
- Plant additional trees along the shoreline to prevent or slow the effects of erosion
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Cannonball North Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Some of the area is suitable for additional wildlife plantings such as trees or shrubs.

CANNONBALL SOUTH AREA

Management Unit. MU #069

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. The Cannonball South Area extends from the Cannonball River to the north edge of the Walker Bottom Recreation Area in Sioux County, North Dakota. This area lies within the external boundary of the Standing Rock Sioux Reservation. The town of Cannon Ball lies adjacent to this management area. A paved road leads to the town, with several dirt trails leading into the management area. In addition, there are several other gravel roads leading east from ND Highway 1806 to the Cannonball South Area.

Description. The topography is of this 3,182-acre area is hilly with steep cutbanks south of the Cannonball River. There are some draws with hardwoods such as oak and chokecherry the predominant species. Mixed native grasses such as wheatgrass, big bluestem, blue grama, and sideoats grama are found at the bottom of the hillsides with some patches of leafy spurge. The vegetation changes toward the top of the hills. These areas are drier with poorer soils. In these rocky areas, yucca is plentiful.

Because of the extensive rangeland, pheasant, partridge and a few sharp-tailed grouse are known to frequent this area. There are also white-tailed deer and mule deer that inhabit the area near the Cannonball River. Both cottontail rabbits and jackrabbits reside in the area, as do porcupine, fox, bobcat, and coyote. In the areas around the Cannonball River, cormorants, pelicans, great blue herons, and bald eagles are present during various times of the year.

The town of Cannon Ball was founded overlooking the Cannonball River. The Sioux called the river "Inyan Wakagapi" meaning "Stone Idol River" for the unique cannonball-like rock formations found in and along the river.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Cannonball South Area is managed for the benefit of a variety of wildlife species. Some tree plantings have been attempted; however, these have been only marginally successful because of the lack of moisture and poor soil types. The Standing Rock Sioux Tribe has grazing rights on much of this unit.

In those areas that are accessible, shoreline fishing and hunting are the main recreational activities in which visitors participate.

Resource Objectives.

- Upgrade the quality of habitat for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Establish food plots, where feasible, to supplement the existing food sources for wildlife
- Plant additional trees along the shoreline to prevent or slow the effects of erosion
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Cannonball South Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Some of the area is suitable for additional wildlife plantings such as trees or shrubs.

WALKER BOTTOM RECREATION AREA

Management Unit. MU #070

Classification. Recreation

Management Agency. Standing Rock Sioux Tribe

Location. The Walker Bottom Recreation Area is located approximately 46 miles south of Mandan in Sioux County, North Dakota. It is roughly 2 miles east of the Prairie Knights Casino operated by the Standing Rock Sioux Tribe. Access to the area is via a 3.5-mile long gravel road leading east from ND Highway 1806.

Description. The topography of this 177-acre area is gently rolling on the western end with a steep access road that slopes toward the shoreline in the east. Brome and yellow sweet clover are the primary species present. There are only small isolated stands of cottonwood and willow along the shoreline. Cedars and green ash are scattered throughout the flatter portions of the area. White-tailed deer, fox, coyote, and rabbit frequent the area.

The area was originally established as a low water access point during the drought in the late 1980s. At that time the southern portion of the area included a vault toilet, single-lane low water boat ramp, and graded parking area. Since that time the SRST has developed the area further. The current development includes 32 camping sites with full electrical hook-ups, air conditioned comfort stations, a fish cleaning grinder, 2 picnic shelters, a 2-lane boat ramp with a large paved parking lot, transient boat slips, security lighting throughout and 24-hour security, volleyball, horse-shoe pits, and a bike/nature trail with interpretive panels.

Public Law 85-915 reserved to the Standing Rock Sioux Tribe and its members the "exclusive permission, without cost, to graze stock on the land between the water level of the (Oahe) reservoir and the exterior boundary of the taking area". This permission has been interpreted by the Comptroller General to include all lands within the defined area, whether acquired from Indians or non-Indians (Comptroller General Decision B-186373 dated 26 May 1977). Further, a Real Estate Division legal opinion was issued on 26 December 1984 which stated: The permission reserved in Public Law 85-915 extended to grazing and haying of these lands. This permission did not extend to cropping.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Walker Bottom Recreation Area is low. Visitors to this lake access are primarily from Sioux County and the Bismarck/Mandan area.

Fishing is the major activity undertaken in this area. Walleye is the primary catch with some northern pike being taken in the spring and fall. Because of the available access into adjacent areas, some hunters use this area as a base camp. Some tree plantings of cedars and green ash have been undertaken in this lake access area.

Resource Objectives.

- Provide resource-oriented development
- Provide shuttle and water-based access to Prairie Knights Casino
- Develop recreation facility plans in cooperation with the SRST to meet developing needs
- Manage vegetation resources for the benefit of wildlife and the conservation of resources
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Provide additional picnic tables, shelters, and grills
- Construct additional parking areas, as warranted, for low-water ramp
- Develop additional camping areas as warranted
- Provide additional vault toilets
- Improve the marina area
- Develop management plan on how to manage sediment in the marina during high and low water
- Plant trees and shrubs for shade and shelter for visitors
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Walker Bottom Recreation Area has further development potential and is a component in the long-range plans of the Standing Rock Sioux Tribe. Although not fully developed, the Walker Bottom Recreation Area receives a good deal of regional use during the walleye fishing season. Therefore, a land use classification of Recreation is appropriate.

PORCUPINE CREEK AREA

Management Unit. MU #071

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. The Porcupine Creek Area begins at Walker Bottom and runs south to 1 Mile Bay south of Fort Yates in Sioux County, North Dakota. The Fort Yates Recreation Area, the Fort Yates Flood Protection project, and the Fort Yates Municipal Park are excluded from this management area. Access to this area is limited to several dirt roads leading from ND Highway 1806 or from the adjacent recreation areas to the north or south.

Description. The terrain of the 3,971-acre Porcupine Creek Area is gently rolling with a few steep cutbanks. Vegetation is primarily mixed grass including crested wheatgrass, blue grama, sideoats grama, and little bluestem. There are small stands of big bluestem located in some of the draws. The woody draws contain stands of bur oak, chokecherry, plum, and snowberry. Cottonwood and willow grow along the shoreline.

There is some use of the area by both mule deer and white-tailed deer as they make their way to the water. Cottontail rabbits, jackrabbits, and turkey reside in the area. Upland game birds also inhabit the area. Pheasants are most often seen but there are occasional sightings of grouse and partridge. Furbearers such as coyote, bobcat, and fox are also found in the management area.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Porcupine Creek Area is somewhat popular with both hunters and fishermen. Upland game is most sought after during the fall hunting season. Walleye are often taken in the waters adjacent to this management area. Wildlife habitat, shelterbelts, and food plots have been planted through partnership efforts with the SRST.

Resource Objectives.

- Maintain the quality of habitat for various wildlife species
- Coordinate with appropriate agencies for management and control of nuisance species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

- Protect any federally or State-listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Porcupine Creek Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe.

FORT YATES RECREATION AREA

Management Unit. MU #072

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Standing Rock Sioux Tribe

Location. The Fort Yates Recreation Area includes all Corps-managed lands in the vicinity of Fort Yates. Fort Yates Recreation Area starts ¼ mile north of the causeway road on the west side of the peninsula then north around to the east side to the Fort Yates evaporation ponds. The only developed recreation area lies in the northeastern portion of the peninsula. Access to this recreation area is by the causeway that runs east from ND Highway 1806 connected to a series of city streets.

Description. The topography of the 141-acre Fort Yates Recreation Area is very rugged hills on the west that flatten out toward the shoreline on the east. It is connected to the mainland by a 1-mile long causeway.

"Standing Rock" comes from an old Indian legend. Legend has it that an Indian woman whose husband took another wife was deeply resentful and decided she would not move with the tribe when it left the campsite. She sat down with her papoose on her back and refused to leave. Finally, the band left her there thinking that she would change her mind and catch up with them later. Toward nightfall, her husband sent her brothers back to look for her. When she was found, she, the baby, and her dog had all turned to stone - "Standing Rock." The brothers brought the stones back with them. From then on the stones were considered sacred and were carried on a travois with the tribe on all its journeys.

When first used as a military fort, Fort Yates was called the Standing Rock Cantonment. Its name was changed to Fort Yates by military officers in 1878 in honor of Captain George W. Yates who was killed in the Battle of Little Big Horn. The Sioux called the town "Inyan Woslata" meaning "Standing Rock".

Mixed grasses are the dominant vegetation with brome and wheatgrass the major species. Trees are scarce in most of the area. The few woody draws present contain cottonwood, hackberry, Siberian elm, green ash, willow, box elder, and oak with an understory of snowberry, plum, and chokecherry.

Wildlife species are not abundant in this area because of the proximity to the town of Fort Yates. However, there is occasional use of the area by white-tailed deer, rabbits, and upland game birds (primarily pheasant).

Recreation facilities in the area include a double-lane boat ramp, courtesy dock, picnic shelter and tables, and vault toilets. An exercise trail has been installed by the Standing Rock Sioux Tribe and is

used by local school children. The Sitting Bull Monument is located on the east side of the causeway in the western portion of this management area.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Fort Yates Recreation Area is low and accounted for 2 percent of the total Oahe project visitation in 2005. Presently, the main use of the Fort Yates Recreation Area is for day use activities such as boating and picnicking. Visitors to the area are primarily residents of the town of Fort Yates and other nearby residents of Sioux County.

Resource Objectives.

- Provide recreation opportunities for day use
- Provide opportunities for water-oriented recreation
- Upgrade the quality of habitat for upland game and other wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Provide additional day use facilities such as playground equipment and fire rings
- Develop a swimming beach
- Develop a hiking/biking trail around the peninsula that ties into the exercise trail
- Upgrade existing boat ramp
- Plant shoreline vegetation, where feasible, to control erosion, to improve the overall aesthetic quality of the area, and to provide additional wildlife habitat.
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Protect facilities from vandalism

Rationale. The Fort Yates Recreation Area currently is a natural gravitation point for the residents of the town of Fort Yates. The easily accessible shoreline makes it attractive for both land-based and water-oriented activities. Because of the submerged standing trees, development in this area may be limited. Because of the amount of visitation to the area, the proximity to the town of Fort Yates, and the amount of facilities available, a land use classification of Multiple Resource Management: Recreation - Low Density is appropriate.

Special Site Conditions. During the filling of Lake Oahe, many acres of standing timber were left uncut in the bottomland around the town of Fort Yates. Today, these submerged and partially submerged trees have become hazards to fishermen, boaters, swimmers, and others who use

the waters in the area. Fort Yates is located on a peninsula and, as such, is exposed to heavy wave action; the soil in the area is easily eroded. Stable beaches have developed along some area of shoreline, but bank erosion continues along other areas. The northeastern portion of the peninsula receives particularly heavy wave action.

FORT YATES FLOOD PROTECTION PROJECT

Management Unit. MU #73

Classification. Operations

Management Agency. Corps of Engineers

Location. The Fort Yates flood protection starts at the evaporation ponds for the water treatment on the northeast side of the island and runs south around the bottom of the island, excluding the Ft. Yates Municipal Park. Access is by Fort Yates causeway off ND Highway 1806/24.

Description. This 197-acre Operations area is established to protect the Town of Fort Yates, the Standing Rock Sioux Tribe, and the Bureau of Indian Affairs. The project consists of rip rap on the eastern side of the island and a levee from the southern tip up to halfway up the western side of the island. The approximate length of the project is 10,980 feet. The levee is tied into lands at an elevation of 1630 ft m.s.l.. The rip rap and levee structures are on the southern half of the island. There is a narrow band of land that contains the structures and space for operations and maintenance of the structures. The eastern half of the island is protected only by rip rap for the wave erosion. The levee starts at the southeastern tip of the island and goes up the western side of the island to its termination point. The levee structure contains five outlet works that allow water to drain out from behind the levee. The Sitting Bull monument is located on the east side of the causeway.

Area Use. The main use is the operation and maintenance of the flood protection structures. Other uses in this unit include recreational walking, sight seeing, fishing, bird watching, and visiting the Sitting Bull monument.

Resource Objectives.

- Maintain the integrity of the structures
- Promote ecological integrity by controlling noxious weeds and woody vegetation
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop access to and erosion protection at the Sitting Bull Monument
- Control the woody vegetation on the levee
- Continue to maintain control of vehicle access
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Operations is assigned to the Fort Yates Flood Protection unit because it is an essential structure in the overall operation of Oahe Project. The structure protects the town of Fort Yates from flooding and erosion during high elevation reservoir levels.

FORT YATES MUNICIPAL PARK

Management Unit. MU #74

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. City of Fort Yates

Location. The Fort Yates Municipal Park Recreation Area includes 1 acre in the town of Fort Yates. Access to this recreation area is by a highway spur that runs east from ND Highway 1806 connected to a series of city streets.

Description. Wildlife species are not abundant in this area because of the proximity to the town of Fort Yates. However, there is occasional use of the area by white-tailed deer, rabbits, and upland game birds, primarily pheasant.

Recreation facilities in the area include playground equipment, and vault toilets.

Visitor Use. Visitation to the Fort Yates Recreation Area is low. Presently, the main use of the Fort Yates Recreation Area is for day use activities such as a neighborhood play area and picnicking. Visitors to the area are primarily local residents of the town of Fort Yates and other nearby residents of Sioux County.

Resource Objectives.

- Provide recreation opportunities for day use
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Provide low impact area for water during a storm event

Development Needs.

- Provide additional day use facilities such as picnic shelters and tables, playground equipment, and fire rings
- Control noxious weeds
- Upgrade play areas

Rationale. The Fort Yates Municipal Park currently is a natural gravitation point for the residents of the town of Fort Yates. Because of the amount of visitation to the area, its location within the town of Fort Yates, and the amount of facilities available, a land use classification of Multiple Resource Management: Recreation - Low Density is appropriate.

Special Site Conditions. This area should not have major facilities as it acts as a holding area for storm waters during extreme events. Control pipes drain the water through the adjacent levee structure thus backing water up during extreme events. The potential of ponding would increase when the lake level requires drainage pipes through the levee to be closed.

ONE MILE BAY

Management Unit. MU #75

Classification. Project Operations

Management Agency. Corps of Engineers

Location. This area begins at the south side of One Mile Bay and runs south approximately one mile. It is in Sioux County, North Dakota and is roughly 1/2-mile south of the Fort Yates causeway and is accessed by a road leading from a causeway off of ND Highway 1806.

Description. This 119-acre is relatively flat except for the area where gravel mining has taken place during years past. Vegetation is limited to mixed grass species. This management area is largely devoid of woody vegetation with just a few cottonwood and willow along the shoreline. The habitat value of this area is limited to upland game birds such as pheasant and grouse, and smaller animals such as rabbits and fox.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This management area has been used as a source of gravel for project roads and has some gravel remaining. Some gravel stockpiles are located here and are used for the upkeep and maintenance of the causeway and levee road top.

Resource Objectives.

- Provide an area to obtain and store gravel and rock used in the operation of the Lake Oahe project
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop wetland area in the small embayment present
- Plant trees and shrubs between this area and the Fort Yates causeway as a screening buffer
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The One Mile Bay area is appropriately classified for Project Operations. This area is used to store rock and gravel required for the operation and maintenance of the project.

FOUR MILE BAY WILDLIFE AREA

Management Unit. MU #76

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This management area extends from One Mile Bay south nearly to the mouth of Four Mile Creek. Located in Sioux County, North Dakota, 1 mile south of Fort Yates and 16 miles north of Kenel, South Dakota, this area is accessed by section line roads leading from ND Highway 1806.

Description. The topography of this 152-acre management area is characterized by a flat plateau with steep cutbanks. There are few woody draws within this area. Vegetation in this area is mixed grasses that include little bluestem, blue grama, sideoats grama, and some brome. Snowberry thickets are found scattered throughout the area. Adjacent land use is agricultural in nature with both irrigated and dry land small grain crops.

Wildlife in the area attracted to the nearby grain fields. These species include white-tailed deer, some mule deer, and cottontail rabbits. Pheasant are the dominant upland game species with occasional sightings of sharp-tailed grouse and partridge.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Current management practices include allowing some of the crops from existing agricultural leases to stand. Some tree plantings have been performed with limited success because of the lack of moisture. Visitor use in the area consists mainly of hunting opportunities.

Resource Objectives.

- Upgrade the quality of habitat for upland game and big game species
- Stabilize the shoreline
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Implement erosion control measures; plant cattails, bulrushes, and trees along the shoreline for erosion control, where feasible
- Plant trees, food plots, and native grasses for wildlife habitat and food supply
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Four Mile Bay Wildlife Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, and food plots.

FOUR MILE BAY LAKE ACCESS

Management Unit. MU #77

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Corps of Engineers

Location. The Four Mile Bay Lake Access is located approximately 4 miles south of Fort Yates. The lake access extends from the mouth of Four Mile Creek west to the project boundary in the upper reaches of the creek. Access is by section line roads leading from ND Highway 1806.

Description. The topography of the 296-acre area is relatively flat, gently sloping toward the shoreline. Vegetation consists of mixed grasses that include brome, some little bluestem, and isolated patches of big bluestem. Riparian vegetation such as cottonwood, willow, and cattail grow along the shoreline.

Wildlife in the area is attracted by the nearby grain fields and the easily accessible water in the creek. These species include white-tailed deer, mule deer, cottontail rabbit, coyote, and fox. Beaver and muskrat reside in the upper reaches of the embayment. Upland game birds, primarily pheasant, are also found in the area. During the spring, Four Mile Creek is a major spawning area for northern pike.

An old railroad grade runs along the eastern portion of the area. At one time, this railroad ran from Bismarck south to the town of Kenel.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to this lake access point is low. Visitors are most often from the local area around Fort Yates. There are no developed facilities within this management area.

Resource Objectives.

- Provide lake access to Lake Oahe
- Provide resource-oriented recreation opportunities
- Maintain and manage the existing vegetation to provide habitat for a variety of wildlife species
- Manage and control nuisance species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop a comprehensive site plan for the entire recreation area, including high and low water conditions
- Improve the access and circulation roads
- Provide a permanent boat ramp, fish cleaning table, and courtesy dock
- Provide for the placement of a security light and telephone as safety precautions
- Develop an interpretive trail to show the area's unique resources and history
- Develop the area with picnic tables, grills, and vault toilets
- Provide additional tree plantings and food plots in the upper reaches of Four Mile Creek
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. This area has some development potential. Because of its nearness to Fort Yates, the ease of access to the water, and the excellent fishery in the embayment, some development in this area should be encouraged. A comprehensive site plan and, thus, the organized development of limited facilities, would lessen the potential negative impact on wildlife habitat in the area. Because of the limited visitation, the lack of developed facilities, and the limited development recommended, this area supports a land use classification of Multiple Resource Management: Recreation - Low Density.

FIRE HEART CREEK AREA

Management Unit. MU #78

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This Sioux County area includes all of the south side of Four Mile Creek Bay and extends southward to the North Dakota/South Dakota State Line. It also includes one small area on the extreme south end of this management area that is not directly adjacent to this area. This small area is located on the north side of the upper reaches of State Line Bay in North Dakota. Access to this area is by dirt trail leading from ND Highway 1806.

Description. The topography of this 1,168-acre management area is gently rolling to flat. There are several drainages present but no steep draws. Mixed grasses including brome, little bluestem, blue grama, and sideoats grama may be found in the area. Riparian vegetation is present along Fire Heart Creek and consists mostly of cottonwood and willow with some green ash and Russian olive.

White-tailed deer and mule deer both inhabit this area. Furbearers including fox, coyote, and beaver also frequent the area. Upland game birds are numerous with the major species being pheasant and sharp-tailed grouse. There are some sandy beaches along portions of this management area. These beaches have the potential for future least tern and piping plover nesting sites.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The management of this area is for the benefit of wildlife. The Fire Heart Creek Area is somewhat popular with both hunters and fishermen. Upland game and big game are most sought after during the fall hunting season. Walleye are often taken in the waters adjacent to this management area.

Some tree plantings have been attempted; however, these have been only marginally successful because of the lack of moisture and poor soil types.

Resource Objectives.

- Upgrade the quality of the resources for the benefit of wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Plant warm and cool season grasses to increase dense nesting cover
- Establish food plots, where feasible, to supplement the existing food sources for wildlife
- Implement erosion control measures
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Fire Heart Creek Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Some of the area is suitable for additional wildlife plantings such as trees or shrubs.

STATE LINE BAY WILDLIFE AREA

Management Unit. MU #79

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This area is located on the south side of State Line Bay in Corson County, South Dakota. It extends south to the Kenel Flats area in Corson County, South Dakota. There is also a small area, not directly adjacent to the above-mentioned portion, that is located immediately south of the North Dakota/South Dakota State Line. Access is limited to dirt trails leading from SD Highway 1806.

Description. The terrain of this 1,223-acre management area is relatively flat, with some draws and moderate cutbanks. There are some cutbanks along the outer portions of the embayment. There is one major drainage entering the embayment through this area - Blackfoot Creek. This management area provides some riparian habitat along the shoreline of State Line Bay. Cottonwood and willow are found in isolated stands with green ash, box elder, and Siberian elm also present. Isolated stands of snowberry and sage may be found throughout the area. Mixed grasses are found throughout the area.

Both white-tailed deer and mule deer inhabit this area. Furbearers such as raccoon, beaver, fox, and coyote can occasionally be seen. Upland game birds reside in the area as well. These include populations of pheasant, grouse, and partridge. During the spring and fall migrations, this embayment is a minor staging area for a variety of waterfowl. Baldhead Bay attracts significant numbers of waterfowl during both the spring and fall migrations. The cultivated grain fields south of the bay help to attract the big game, upland game, and waterfowl to the area.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Some tree plantings have been done, where feasible. There is some recreational use of this management area because of the game species present. Deer and pheasant hunting is the major activity undertaken. There is also some trapping that takes places as well as fishing and photography.

Resource Objectives.

- Provide opportunities for hunting
- Maintain, protect, and monitor any cultural resource sites that are discovered in the area.
- Maintain and improve the quality of habitat for wildlife
- Promote ecological integrity by controlling noxious weeds
- Protect any State- or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Plant food plots and trees to improve the overall aesthetic quality of the area and provide an additional wildlife food supply and habitat
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species

Rationale. The organized development of limited facilities in the area would lessen the potential negative impact on wildlife habitat in the area. Because of the wildlife program that is in effect and the limited development recommended for the area, the State Line Bay Wildlife Area supports a land use classification of Multiple Resource Management: Wildlife Management.

KENEL FLATS AREA

Management Unit. MU #80

Classification. Environmentally Sensitive

Management Agency. Corps of Engineers

Location. The management area includes land on the north side of Hunkpapa Creek, and includes the old town site of Kenel, South Dakota in Corson County. Kenel Flats is located 6 miles south of the North Dakota/South Dakota State Line, 30 miles north of Mobridge, South Dakota and 85 miles south of Mandan, North Dakota. Access to the area is by an unimproved dirt trail over one mile in length leading from SD Highway 1806.

Description. The terrain of the 507-acre Kenel Flats Area is relatively flat with sandy, loamy soil. In the north, there are cutbanks in the area of the old town site that average 5 to 10 feet high. Grassy vegetation is mixed with alfalfa, sweet clover, and some crested wheatgrass. Woody vegetation is confined to the shoreline areas and consists mostly of cottonwood, willow, green ash, and occasional Russian olive. There are some standing dead trees offshore. A few domestic shrubs such as lilac and chokecherry are scattered throughout the old town site.

Toward the southern end of this management area, the terrain becomes very flat with an expansive sandy beach. Willow and cottonwood are plentiful in the riparian area around Hunkpapa Creek. The shoreline is subject to periodic inundation toward the southern end of this management area.

The original town of Kenel was also located in this area. It was named after one of the early missionaries, Father Martin Kenel, who was highly regarded in the Standing Rock Sioux community. Just north of the old town site, a stone monument was erected to commemorate Father Kenel as well as Right Reverend Martin Marty, another of the early religious leaders in the area. A stone grotto was also erected in the area near the monument. During the construction of Oahe Dam and the subsequent inundation by the lake, the town site of Kenel was relocated to a hill approximately 2.5 miles south of its original location. Although there are no residential structures standing, there is evidence of the existence of old town site. Remnants of sidewalks, cisterns, and wells can still be seen.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This management area provides habitat for both white-tailed deer and mule deer. Upland game in the area includes pheasant, grouse, and partridge. Hunkpapa Creek is a minor

staging area for waterfowl during their spring and fall migrations. It is also a resting area for sandhill cranes. Some whooping cranes have been seen in this area migrating with the sandhill cranes. Because of the wide beach with fine sand, the least tern and piping plover are known to nest and rear their young in these areas.

Visitation to this area is low but it does receive some visitation from local residents. Swimming, sunbathing, fishing, and hiking are popular activities. There has been no facility development in this area.

Resource Objectives.

- Provide appropriate resource access
- Promote the non-consumptive uses of the resources through activities such as hiking, photography, and sightseeing
- Upgrade the habitat for area wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Resolve access issues and other sensitive issues in the area
- Provide picnic tables and vault toilet for the area at elevations that are not likely to be flooded
- Plant additional trees and shrubs, where feasible, to increase the habitat and food supply for resident wildlife
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. The Kenel Flats Area receives some visitation from local residents but because there is no guaranteed access into the area, visitation is low. This area is one that was mentioned in a document entitled "The Standing Rock Reservation - The Recreation Development Potential, An Atlas of Sites," prepared by the Bureau of Indian Affairs for the Standing Rock Sioux Tribe in 1986. This report is an inventory of the recreation resources of the reservation and considers the possibilities for developing specific sites as well as historic, cultural, and scenic landmarks. Many of the development needs identified in the development of this master plan were also noted in the above-mentioned Standing Rock document. Any development undertaken should be conducted outside of breeding or nesting periods for the least tern and piping plover and any construction should take place away from areas used by these endangered and threatened species. Because of the

nature of the area and the suggested minimal facility development to support resource-oriented activities, a land use classification of Environmentally Sensitive is appropriate for this area.

LEAVENWORTH CREEK AREA

Management Unit. MU #81

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. The Leavenworth Creek Area extends approximately 25 miles, from the Kenel Flats Area to the mouth of Oak Creek, roughly 4 miles north of Mobridge, in Corson County, South Dakota. This management area excludes a portion of land on the north side of Blackhawk Bay. Because of the rugged terrain, access to the area by land is difficult but it can be reached by boat.

Description. The terrain of this 4,885-acre area is steep, rugged hills with deep draws and severe cutbanks in many areas. There are four main drainage ways that run through this management area and empty into Lake Oahe. They are (from north to south) Blackhawk Creek, Mad Bear Creek, Leavenworth Creek, and Cuthead Creek. Only these areas contain significant numbers of trees - primarily cottonwood and willow. Trees in the remainder of the area are virtually nonexistent. There are very small isolated stands of bur oak, green ash, and Russian olive in some of the draws. Shrubs including chokecherry, plum, and silverberry are found in some areas. Mixed grasses and forbs make up the majority of the vegetation. Goldenrod, sunflower, leadplant, and yucca are also found in the area.

Upland game birds are plentiful. These include pheasant, sharp-tailed grouse, and Gray partridge. Mule deer is the primary big game species present although an occasional white-tailed deer can be found in the drainages. Waterfowl congregate in the many small bays during their spring and fall migrations. Raptors, such as bald eagles, hawks, and falcons migrate through the area following the waterfowl. A rather large prairie dog town is located in the extreme northern portion of this management area. Other furbearers residing in the area are beaver, raccoon, cottontail rabbits, fox, and coyote.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Leavenworth Creek Area is managed for the benefit of a variety of wildlife species. Some tree plantings have been attempted; however, these have been only marginally successful because of the lack of moisture and poor soil types. The Standing Rock Sioux Tribe has grazing rights on much of this unit.

In those areas that are accessible, fishing and hunting are the main recreational activities in which visitors participate.

Resource Objectives.

- Upgrade the quality of habitat for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Establish food plots at lower elevations to supplement the existing food sources for wildlife
- Plant additional trees along the shoreline to prevent or slow the effects of erosion. Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species. The area is suitable for additional wildlife plantings.

BLACKHAWK CREEK LAKE ACCESS

Management Unit. MU #82

Classification. Multiple Resource Management: Future Recreation Area

Management Agency. Corps of Engineers

Location. The Blackhawk Creek Lake Access is located in Corson County, South Dakota on the north side of Blackhawk Bay approximately 12 miles south of the North Dakota/South Dakota State Line. Access to the area is by dirt trails leading east from SD Highway 1806.

Description. The topography of this 280-acre area is hilly but gradually flattens out toward the shoreline. Vegetation consists of mixed grasses with some cottonwood and willow along the shoreline. During periods of lower lake elevations, patches of leafy spurge can be found.

Wildlife in the area is predominantly upland game such as pheasant and grouse with an occasional partridge taken. Big game animals such as white-tailed deer and mule deer can sometimes be found. Mule deer, however, prefer the upland areas while white-tailed deer inhabit the woody draws and riparian areas.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Blackhawk Creek Area is low, with visitors coming from the Kenel area and other local residences. Activities enjoyed in the area include picnicking, swimming, and fishing. Deer and pheasant hunting is popular during the late fall.

Resource Objectives.

- Provide lake access for boating and fishing
- Provide opportunities for hunting
- Maintain and improve the quality of habitat for wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Provide a designated parking area at a lower elevation not likely to be flooded
- Plant food plots and trees to improve the overall aesthetic quality of the area and to provide an additional wildlife food supply and habitat
- Control noxious weeds

- Provide appropriate protection for any cultural resources

Rationale. The Blackhawk Creek Lake Access Area should be maintained as a wildlife management area with a small primitive lake access point. Only limited facility development should be undertaken in order to preserve the wildlife benefits. The organized development of limited facilities would lessen the potential negative impact on wildlife habitat in the area. As such, this area supports a land use classification of Multiple Resource Management: Future Recreation Area.

OAK CREEK AREA

Management Unit. MU #83

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This management area extends from the mouth of Oak Creek to the SD Highway 1806 bridge (also known as "The Singing Bridge") in Corson County, South Dakota. This area encompasses all project land on both sides of the Oak Creek embayment. Access is from SD Highway 1806.

Description. The 1,937-acre Oak Creek Area is characterized by gently rolling hills and flat plateaus. There are significant cutbanks at the mouth of Oak Creek. Grasses in the area consist mostly of native mixed grass prairie with some introduced species. There is a limited amount of woody vegetation except in the upper reaches of the embayment where there is excellent riparian habitat. Here, cottonwood and willow can be found along with some stands of green ash, bur oak, and American elm. Understory species of plum, snowberry, and hackberry are also present.

This area is home to a variety of upland game species including pheasant, sharp-tailed grouse, and partridge. These species are probably attracted to the area because of the availability of food from the nearby agricultural fields. During spring and fall migrations, Oak Creek is a resting area for a variety of waterfowl. Bald eagles, hawks, and other raptors can also be found during waterfowl migration times preying on the old, the very young, or the sick ducks and geese. Furbearers such as beaver, raccoon, skunk, fox, and coyote also reside in this management area.

Oak Creek was so named because of the numerous oak trees found at one time along its course. The name sometimes appears as "North Oak Creek" to distinguish it from a small stream tributary of the Grand River. It is also known as "Wakpala Creek" because it flows through the town of that name.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed for the benefit of a variety of wildlife species. Tree plantings of cottonwood, green ash, and Russian olive have been made in the area, where feasible, to provide additional woody vegetation and cover. Some food plots have also been established although the adjacent landowners do leave a portion of their crops standing to supplement the existing food supply for wildlife.

Because of the plentiful amount of upland game birds present, hunting is a popular activity. Shoreline fishing is also popular, especially with the local residents of Wakpala. Primary catches include both walleye and northern pike.

Resource Objectives.

- Monitor impacts of adjacent gravel pits on wildlife habitat in this area
- Upgrade the quality of habitat for upland game and waterfowl
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for optimum use by wildlife and fisheries
- Establish food plots at lower elevations to supplement the existing food sources for wildlife
- Plant additional trees along the shoreline to prevent or slow the effects of erosion
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species, as well as waterfowl. The area is suitable for additional wildlife plantings.

SINGING BRIDGE LAKE ACCESS

Management Unit. MU #84

Classification. Multiple Resource Management: Future Recreation Area

Management Agency. Corps of Engineers

Location. The Singing Bridge Lake Access is in Corson County, South Dakota. It begins immediately west of SD Highway 1806 as it crosses the mouth of the Grand River and extends approximately 3/4-mile upstream into the Grand River arm. Access to the area is directly from the highway.

Description. This 71-acre area is characterized by rolling hills that flatten out toward the shoreline. Vegetation is primarily mixed grass with isolated stands of cottonwood and willow along the shoreline. Cottonwood can also be found in some of the small draws present.

Because of the unit's proximity to the highway and human intrusion, wildlife species in the area are limited to small furbearers and upland game. Rabbit, skunk, and fox have all been seen in the area. Pheasants predominate with occasional sightings of sharp-tailed grouse. There is only incidental use of the area by white-tailed deer and mule deer.

There are no developed recreation facilities in the Singing Bridge area; however, a municipal water intake for the town of Wakpala is located in this management area.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation is relatively low in this management area and is seasonal. Most visitors come from the nearby towns of Mobridge, Wakpala, or other communities in the area. Shoreline fishing is the primary activity enjoyed with walleye, northern pike, and catfish the major catches. Some wading and swimming also occurs.

Resource Objectives.

- Provide lake access for fishing
- Maintain and improve the quality of habitat for wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Develop limited day use facilities at lower elevations that are not likely to be flooded
- Provide a designated parking area at a lower elevation that is not likely to be flooded
- Plant food plots and trees to improve the overall aesthetic quality of the area and to provide an additional wildlife food supply and habitat
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. Until such time as this area can be a developed recreation facility, the Singing Bridge Lake Access Area should be maintained for wildlife management with a primitive lake access point. Only limited facility development should be undertaken. The organized development of limited facilities would lessen the potential negative impact on wildlife habitat in the area. As such, this area supports a land use classification of Multiple Resource Management: Future Recreation Area.

GRAND RIVER WILDLIFE AREA

Management Unit. MU #85

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This management area surrounds the Grand River arm of the reservoir in Corson County, South Dakota. The area extends from the Singing Bridge Lake Access and ends at the mouth of Claymore Creek. This management area excludes the Grand River Recreation Area. Access to this area is by dirt roads leading from SD Highway 1806.

Description. The topography of this 6,188-acre management area is varied. Along most of the eastern portion of the Grand River arm of the reservoir, there are rugged hills and small plateaus with steep cutbanks. Heavy gumbo soils predominate. Return flows from the irrigated cropland adjacent to the project have caused severe bank erosion, especially in the area immediately east of the U.S. Highway 12 Bridge on the south side of the Grand River. At the upper reaches of the Grand River (west of U.S. Highway 12), the terrain is typical of a floodplain. Here, there are expansive flat areas with heavily wooded bottomlands and braided channels of the Grand River.

Vegetation is characteristic of both upland and wetland sites. In the upland area, brome, western wheatgrass, sideoats grama, blue grama, and crested wheatgrass predominate with stands of snowberry, wild rose, and silverberry in the draws. West of U.S. Highway 12, there is extensive riparian habitat that includes cottonwood, willow, bur oak, silverberry, and snowberry. Forbs in the area include thistle, kochia, and sunflower.

Wildlife in the area varies with the terrain. Mule deer inhabit the upland areas while white-tailed deer may be found more in the riparian areas. North of the Grand River, occasional pronghorn and mink may be seen. Upland game birds including pheasant, sharp-tailed grouse, and Gray partridge are plentiful. The Grand River arm is an important nesting, resting, and feeding area for migratory waterfowl. Bald eagles, hawks, and other raptors follow the migrating waterfowl flocks and also migrate through the area. Shorebirds are numerous with several species of killdeer, terns, and gulls found in the area. Standing dead trees provide habitat for cormorants and great blue heron. There are relatively large prairie dog colonies on the north side of the U.S. Highway 12 Bridge across the Grand River and near the mouth of Deep Bank Creek.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Grand River Wildlife Area is managed for the benefit of a variety of wildlife species. In those areas that are accessible, shoreline fishing and hunting are the main recreational activities in which visitors participate.

Resource Objectives.

- Upgrade the quality of habitat for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources
- Protect any State or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Plant shoreline vegetation to control erosion
- Manage vegetation for optimum use of wildlife and fisheries
- Establish food plots at lower elevations to supplement the existing food sources for wildlife
- Control noxious weeds
- Provide appropriate protection for any cultural resources
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species. The area is suitable for additional wildlife plantings.

GRAND RIVER RECREATION AREA

Management Unit. MU #86

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Standing Rock Sioux Tribe

Location. The Grand River Recreation Area is located on the west side of U.S. Highway 12 where it crosses the Grand River in Corson County, South Dakota. The area includes only project land south of the river. Direct access is available from the highway.

Description. The topography of this 19-acre management area is relatively flat. Vegetation primarily consists of mixed grasses. Cottonwood and willow can be found growing along the shoreline. The area only receives incidental use by wildlife.

There are developed facilities at the Grand River Recreation Area. These facilities include vault toilet, picnic shelters, and picnic tables.

The CRMP has identified no cultural sites in this area. However, prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. The visitation to this area is low. The majority of the use at this site is based on its function as a roadside rest area. There is also some day use, including shoreline fishing and picnicking as well as some primitive camping.

Resource Objectives.

- Provide for resource-oriented development
- Provide lake access for fishing
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Investigate innovative waste management methods to alleviate impacts from highway traffic
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Grand River Recreation Area has limited potential for much additional development because of the restricted availability of land in this area. This recreation area could

provide some additional facilities such as a expanded parking area. The organized development of limited facilities would lessen the potential negative impact on wildlife habitat in the area. Because of the limited potential for expansion, this area supports a land use classification of Multiple Resource Management: Recreation - Low Density.

CLAYMORE CREEK AREA

Management Unit. MU #87

Classification. Multiple Resource Management: Wildlife Management

Managing Agency. Corps of Engineers

Location. This management area is located roughly 3 miles northwest of Mobridge in Corson County, South Dakota. The Claymore Creek Area extends from the upper reaches of Claymore Creek north of U.S. Highway 12 and ends approximately 1 mile south of Indian Memorial Campground, the management of which is excluded from this area. Access to the area is from roads leading from either U.S. Highway 12 or SD Highway 1806.

Description. The terrain of the 681-acre Claymore Creek Area is flat in the northwest around Claymore Creek and the Grand River but becomes very rugged with high plateaus and cutbanks in the south. In the creek bottom, isolated stands of cottonwood and willow are found along the shoreline. In the upland areas to the south, woody vegetation is extremely sparse with just an occasional cedar. A mixed grass prairie is predominant vegetation in the area with blue grama, buffalo, and wheat grasses being some of the species.

Wildlife in the area consist of a few white-tailed and mule deer. Upland game birds, especially pheasant, are plentiful. Small furbearers can occasionally be seen in the area. These include fox, coyote, rabbit, skunk, and some raccoon around Claymore Creek.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Claymore Creek Area is managed for the benefit of a variety of wildlife species. In those areas that are accessible, shoreline fishing and hunting are the main recreational activities in which visitors participate.

Resource Objectives.

- Upgrade the quality of habitat for wildlife species
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries

- Establish food plots at lower elevations to supplement the existing food sources for wildlife
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Claymore Creek Area because it serves as a travel corridor for wildlife moving between upland areas and Claymore Creek and Lake Oahe. Much of the area around Claymore Creek is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

INDIAN MEMORIAL RECREATION AREA

Management Unit. MU #88

Classification. Recreation

Management Agency. Standing Rock Sioux Tribe

Location. The Indian Memorial Recreation Area is located on an irregular-shaped segment of land at the intersection of U.S. Highway 12 and SD Highway 1806. The recreation area is roughly 2 miles northwest of Mobridge in Corson County, South Dakota. This is the southern-most developed recreation area within the external boundary of the Standing Rock Sioux Reservation.

Description. This recreation area is varied. In the day use area north of U.S. Highway 12, the terrain of this 278-acre management area is gently rolling but flattens out toward the shoreline. South of the highway, the terrain is flat with an extensive riparian area south of the campground.

As a result of construction over time and constant use by the public, mixed grass species are present. Woody vegetation includes cottonwood, willow, green ash, Russian olive, and Siberian elm. Chokecherry, plum, silverberry, and buffaloberry thickets are found scattered along the shoreline.

Because of the high visitation that this recreation area receives, wildlife use is transient. A few species are attracted to the riparian area. White-tailed deer can occasionally be seen wandering through the campground on their way into the cottonwood/willow stands. Pheasant are often seen in the grassy portions of the recreation area. Small furbearers such as rabbit, raccoon, and skunk reside in the area.

This recreation area supports both day use and camping activities. The area is divided into three use areas. North of U.S. Highway 12 is a day use area which contains a 3-lane boat ramp, courtesy docks, fish cleaning station, large paved parking lot, comfort station, vault toilets, and picnic shelters. The small embayment around the boat ramp provides for easier boat launching and retrieval during times of unfavorable weather conditions. The Corps and the SRST partnered to install a 2-lane boat ramp in the campground area.

South of the highway is a fully developed campground. It contains designated camppads with electricity, comfort station, vault toilet, potable water, dump station, playground, and amphitheater.

Also located south of the highway is a small marina with a boat ramp, boat slips for overnight use, rental cabins, fish grinder, and camp store operated by a third-party concession through the SRST. A monument erected to Jedediah Smith is located within this recreation area at the intersection of U.S. Highway 12 and SD Highway 1806.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to the Indian Memorial Recreation Area is moderate-to-high. It is one of the three most heavily used recreation areas located in the middle third of Lake Oahe - the other areas being Indian Creek and West Whitlocks. Visitors to this recreation area originate from Mobridge, Aberdeen, Wakpala, and other communities from both sides of Lake Oahe. In addition, this area is used for overnight camping by people passing through the area on their way to or from the Black Hills or Yellowstone.

The primary activity enjoyed by visitors to the area is fishing. There is excellent shoreline fishing in both portions of the recreation area, as well as excellent boat launching facilities. Northern pike and walleye are the most sought-after fish although small-mouthed bass and lake trout are also taken. Other activities enjoyed in this recreation area are camping, picnicking, hiking, photography, and bird watching.

Resource Objectives.

- Provide lake access for fishing and boating
- Provide recreation facilities for day use activities and camping
- Provide the opportunity for general recreation and intensive facility development
- Provide interpretation of the unique natural resources in the area
- Promote non-consumptive uses of resources such as hiking, photography, and sightseeing
- Upgrade the quality of wildlife habitat
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources

(Day use area)

- Provide temporary docking facility for boats
- Provide playground equipment
- Construct a multipurpose court which will provide opportunities for basketball, tennis, and volleyball
- Develop swim beach, if feasible
- Provide additional picnic tables and shade shelters near the parking lots
- Develop trails around the picnic area

(Camping area)

- Enlarge/update playground equipment
- Develop a series of nature trails using the existing unpaved roads south of the main campground
- Develop an area for campers to beach their boats and tie up overnight

Rationale. The Indian Memorial Recreation Area is one of the major regional recreation areas on the west side of Lake Oahe. This area receives considerable use from residents of north-central South Dakota. The easily accessible shoreline makes it attractive for water-oriented recreational activities. The variety of land-based resources also contributes to the area's appeal.

This area was identified in the 1988 RMO Study prepared for the State of South Dakota as having the potential for a destination-type resort development. Because of its location on the lake, the Indian Memorial Recreation Area plays an important role in water-oriented recreation on Lake Oahe. Any development in this area would complement future development in the Pierre, Gettysburg, Pollock, and Bismarck areas by offering supplies and fuel for those recreationists visiting the middle reach of Lake Oahe.

The Indian Memorial Recreation Area supports a land use classification of Recreation because of the aesthetic qualities, suitable resources, and the diversity of the existing recreational facilities.

DEADMAN'S CREEK AREA

Management Unit. MU #089

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers

Location. This management area extends from the south end of the Claymore Creek Area to the Corson/Dewey County Line at LeCompte Bay. The northern portion of the peninsula in LeCompte Creek is included in this MU. It is the southern-most management area located within the external boundary of the Standing Rock Sioux Reservation. Access to the area is limited to a few dirt trails and boat.

Description. The terrain in the northern portion of this 1,789-acre management area is flat plateaus that slope to the water. In the south there are rolling hills with some steep cutbanks. Mixed grasses are found in this area. The woody draws present contain isolated stands of green ash, cottonwood, silverberry, and snowberry. The upper portion of Deadman's Bay has some limited riparian areas of cottonwood, willow, green ash, and skunk brush. In the remainder of this area, woody vegetation is limited to scattered cedars.

This area has significant populations of white-tailed deer, mule deer, and pronghorns that are primarily attracted by the adjacent agricultural lands. Sharp-tailed grouse, Gray partridge, and some pheasant also reside in this area. Small furbearers such as beaver, skunk, raccoon, fox, coyote, and prairie dogs inhabit portions of this management area. The many embayments act as resting areas for migrating waterfowl.

There are two monuments that do receive some visitation. The Sitting Bull Monument and the Sakakawea Monument are located near the south end off SD Highway 1806, on land adjacent to project land.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The management of this area is for the benefit of wildlife. The Deadman's Creek Area is somewhat popular with both hunters and fishermen. Upland game and big game are most sought after during the fall hunting season. Walleye, northern pike, and white bass are often taken in the waters adjacent to this management area.

Resource Objectives.

- Upgrade the quality of the resources for the benefit of wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species. The area is suitable for additional wildlife plantings.

LITTLE BEAR CREEK AREA

Management Unit. MU #90

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This 400-acre management area extends south from the Corson/Dewey County line to the upstream end of Three Legs Creek, just north of the Moreau River. However, it excludes the land on the north side of Molstad Bay. This is the northern-most management area located within the external boundary of the Cheyenne River Sioux Reservation. Access to this management area is primarily by boat and unimproved dirt roads.

Description. The terrain of this management area consists of rolling hills and steep breaks. Gumbo soil in the north gives way to silty loamy soils in the south. Vegetation is primarily mixed native grasses and include little bluestem and western wheatgrass. The woody draws located within this area contain green ash and cottonwood. The small embayments may contain stands of cottonwood and willow.

Both mule deer and white-tailed deer inhabit this management area with the white-tailed deer preferring the wooded draws. Pronghorns can also be seen on occasion. Sharp-tailed grouse and partridge reside in the area along with some pheasant. Furbearers including beaver, raccoon, skunk, fox, and coyote are all found in this management area. The many small embayments are used by a variety of waterfowl during spring and fall migrations.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Little Bear Creek Area is managed to upgrade the vegetation in the upland areas and to improve riparian areas for waterfowl, upland, and big game species. Shelterbelts of green ash, cedar, Russian olive, and chokecherry have been planted in various locations around the area to increase the amount of woody vegetation and dense nesting cover. Where conditions are favorable, food plots have been established as supplemental food sources for wildlife.

Resource Objectives.

- Upgrade the quality of the resources for the benefit of wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries
- Establish food plots at lower elevations to supplement the existing food sources for wildlife
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species. The area is suitable for additional wildlife plantings.

MOLSTAD BAY AREA

Management Unit. MU #91

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 m.s.l.)

Location. The Molstad Bay Area is located approximately 2 miles south of the Corson/Dewey County line and encompasses the northern portion of the embayment. Access to the area is by unimproved dirt road.

Description. This management area has 31 acres of rolling hills that flatten out toward the shoreline. A mixed grass prairie with little bluestem, brome, and western wheatgrass can all be found in the area. Woody vegetation is limited to cottonwood, willow, and green ash growing along the shoreline and in some of the small draws.

Wildlife attracted by nearby agricultural lands and the availability of water resides in the area. White-tailed deer and mule deer, along with sharp-tailed grouse and gray partridge, are known to inhabit the area. Fox and coyote can occasionally be seen.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Molstad Bay Area is managed to upgrade the vegetation in the upland areas and to improve riparian areas for waterfowl, upland, and big game species. Shelterbelts of green ash, cedar, Russian olive, and chokecherry have been planted in various locations around the area to increase the amount of woody vegetation and dense nesting cover. Where conditions are favorable, food plots have been established as supplemental food sources for wildlife.

Resource Objectives.

- Upgrade the quality of the resources for the benefit of wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources.

Development Needs.

- Plant trees and shrubs to increase winter cover, woody vegetation, and dense nesting cover
- Establish food plots at lower elevations to supplement the existing food sources for wildlife

- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Molstad Bay Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

MOREAU RIVER AREA

Management Unit. MU #92

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 m.s.l.)

Location. The Moreau River Area extends from the upper end of Three Legs Creek to just south of No Mouth Creek and includes all of the Moreau River Arm. This area is located near the community of Blackfoot. Access to this area is limited to dirt trails leading from BIA Road 7.

Description. The topography of this 3,892-acre area is varied. Toward the mouth of the Moreau, there are rolling hills with some cutbanks. The upper reaches of the Moreau River flatten out into a typical floodplain forest. The vegetation in the upland area consists of little bluestem, big bluestem, and western wheatgrass. Woody draws contain stands of bur oak and green ash. The riparian area along the Moreau River is characterized by extensive stands of cottonwood, willow, bur oak, and green ash with understories of snowberry, plum, and chokecherry. There are also large stands of willow in the extreme upstream end of the river. Wetland areas contain several species of sedges and rushes.

The river bottomland is home to a variety of furbearers including cottontail rabbits, squirrel, beaver, muskrat, raccoon, skunk, fox, and coyote. Turkey are found in the extreme western portion of this management area. Raptors such as hawks and owls nest in this area. Bald eagles and some golden eagles can be found along the Moreau River during migration times and occasionally during winter roosting times. During the spring and fall migration periods, numerous waterfowl species can be found along the river. Attracted to many wetland areas and adjacent cropland, mallard are plentiful, along with some wood ducks and coots.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Moreau River Area is managed for the benefit of a variety of wildlife species. Food plots of sunflower, milo, and millet have been established in the lowlands around the Moreau River. These plots have helped in attracting a variety of wildlife.

Many people using the Moreau River Area come from the local area within the Cheyenne River Sioux Reservation, although many come from throughout central South Dakota. Visitation to the area is seasonal corresponding to the hunting season. Because of the large population of wildlife present, the management area receives considerable hunting pressure. Visitors also participate in

shoreline fishing and trapping activities. In addition, there is a small lake access point near the mouth of the Moreau near the community of Blackfoot. This access area receives only limited use.

Resource Objectives.

- Provide and maintain high quality and diverse vegetative resources to provide food and shelter for wildlife
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Plant additional trees and shrubs to increase winter cover and woody vegetation for wildlife
- Supplement native food sources for upland and big game species
- Control noxious weeds
- Construct a vault toilet, shade shelter, and fire pit near the lake access point
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Moreau River Area because it serves as a travel corridor for wildlife moving between upland areas and Lake Oahe. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

BENDER BAY LAKE ACCESS

Management Unit. MU #93

Classification. Multiple Resource Management: Future Recreation Area

Management Agency. Corps of Engineers (below elevation 1620 m.s.l.)

Location. The Bender Bay Lake Access is located in Dewey County on the northern side of Moreau River arm of Lake Oahe. It is accessed only by dirt trails.

Description. The topography of this 5-acre area is one of rolling hills and few cutbanks. The vegetation in the upland area consists of little bluestem, big bluestem, and western wheatgrass. Woody draws contain stands of bur oak and green ash. The riparian area along the Moreau River is characterized by extensive stands of cottonwood, willow, bur oak, and green ash with understories of snowberry, plum, and chokecherry. There are also large stands of willow in the extreme upstream end of the river. Wetland areas contain several species of sedges and rushes.

The area is home to a variety of furbearers including cottontail rabbits, squirrel, beaver, muskrat, raccoon, skunk, fox, and coyote. Raptors such as hawks and owls nest in this area. Bald eagles and some golden eagles can be found along the Moreau River during migration times and occasionally during winter roosting times. During the spring and fall migration periods, numerous waterfowl species can be found along the river. Attracted to many wetland areas and adjacent cropland, mallard are plentiful, along with some wood ducks and coots.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This remote area is used by local fishermen as a shoreline access point for boating and shoreline fishing. However, because of the dirt ramp leading to the shore and a lack of proper boat ramp, it is not feasible for any fishermen to launch their boats for recreational use.

Resource Objectives (for the Corps-managed areas only)

- Provide lake access for boating and fishing
- Upgrade the quality of wildlife habitat along the shoreline for both upland and waterfowl species
- Preserve, monitor, and protect any cultural resources

Development Needs (for the Corps-managed areas only).

- Plant trees and native species to improve the cover near the shoreline as a supplemental food source for wildlife
- Plant shoreline vegetation where feasible to control erosion and to improve the overall esthetic quality of the area
- Construct a vault toilet, shade shelter, and fire pit near the lake access point
- Control noxious weeds

Rationale. The lands of the Bender Bay Lake Access above elevation 1620 m.s.l. were transferred to the Cheyenne River Sioux Tribe. Development of future park facilities will be the discretion of the tribe. However, the organized development of facilities would lessen the potential negative impact on wildlife habitat in the area. The Corps resource objectives and development needs are consistent with its limited role in the management of this area. Although there are no facilities in this area at this time, this area has the potential for becoming a recreation area in the future. Thus, the classification of Multiple Resource Management: Future Recreation is appropriate. Until that time, the area will continue to be managed for wildlife purposes.

SWIFT BIRD CREEK AREA

Management Unit. MU #94

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Swift Bird Creek Area consists of roughly 1,729 acres. It is located in Dewey County and extends roughly 25 miles from the mouth of the Moreau River to the Old Agency Park Recreation Area on the west side of the U.S. Highway 212 bridge. Access to the area is by boat and a few dirt trails leading from BIA Road 7.

Description. The topography of the adjacent upland to this management area is extremely rough with rugged hills and steep cutbanks. Gumbo soils are present in this area and many slick spots of Pierre shale can be seen. Vegetation primarily consists of mixed grass prairie with some yucca and prickly pear cactus present. The woody draws in the area contain bur oak, green ash, cedar, silverberry, plum, and chokecherry. Cottonwood and willow are found in isolated areas along the shoreline.

Mule deer and pronghorn reside in the rugged country of this area. Sharp-tailed grouse are the major upland game species present with some partridge and pheasant also in the area. A variety of raptors such as hawks, owls, and eagles can be seen during various times of the year. Waterfowl are attracted to the many small embayments during migration times.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Swift Bird Creek Area is managed for the benefit of a variety of wildlife species. Some trees have been planted in some of the upland areas, but survivability has been poor because of the poor soils and lack of moisture. There are a number of upland and waterfowl birds that come into the bay areas. There are also deer and pronghorns that use the lake as a water source. Some hunting does take place in the area with the primary game being grouse. Shoreline fishing and trapping is also performed in those areas that allow relatively good access.

Resource Objectives.

- Upgrade the quality of the upland game habitat
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Plant trees and shrubs to increase winter cover, woody vegetation, and dense nesting cover
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Swift Bird Creek Area because it serves as habitat for a variety of wildlife. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

BLACKFOOT AREA

Management Unit. MU #95

Classification. Multiple Resource Management: Future Recreation Area

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area is located on Lake Oahe 1 mile south of the confluence of No Mouth Creek and the Moreau River Access is by a gravel road and dirt trail.

Description. This 14-acre area is one of rolling hills and few cutbanks. The vegetation in the upland area consists of little bluestem, big bluestem, and western wheatgrass. Woody draws contain stands of bur oak and green ash.

White-tailed deer and mule deer, along with sharp-tailed grouse and gray partridge, are known to inhabit the area. Fox and coyote can occasionally be seen.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is used by local fishermen as a shoreline access point to the lake. There are a number of upland and waterfowl birds that come into the bay areas. There are also deer and pronghorns that use the lake as a water source.

Resource Objectives

- Provide lake access for boating and fishing
- Upgrade the quality of wildlife habitat along the shoreline for both upland and waterfowl species to increase the amount of winter cover
- Preserve, monitor, and protect any cultural resources

Development Needs .

- Plant trees and native species to improve the cover near the shoreline as a supplemental food source for wildlife
- Plant shoreline vegetation where feasible to control erosion and to improve the overall esthetic quality of the area

Rationale. The lands of the Blackfoot Lake Access above elevation 1620 m.s.l. was transferred to the Cheyenne River Sioux Tribe. Development of future park facilities will be the discretion of the tribe. However, the organized development of facilities would lessen the

potential negative impact on wildlife habitat in the area. The Corps resource objectives and development needs are consistent with its limited role in the management of this area. Although there are no facilities in this area at this time, this area has the potential for becoming a recreation area in the future. Thus, the classification of Multiple Resource Management: Future Recreation Area is appropriate. Until that time, the area will continue to be managed for wildlife purposes.

OLD AGENCY PARK

Management Unit. MU #96

Classification. Multiple Resource Management: Recreation- Low Density

Management Agency. Corps of Engineers (below elevation 1620 m.s.l.)

Location. The Old Agency Park area lies on the west shore of Lake Oahe, east of U.S. Highway 212. Access to the area is directly from the highway.

Description. Topography of this 46-acre area ranges from nearly level to rolling hills. There are some cutbanks along the east side of the park and some sandy beach areas along the shoreline in the south. Vegetation consists of mixed grasses. Green ash, ponderosa pine, cottonwood, cedar, and Russian olive are all found in this area - many of them products of past tree planting efforts.

Small game including pheasant and grouse are found. Small furbearers seen in this management area include cottontail rabbit, fox, and raccoon. Bald eagles migrate through the area following flocks of waterfowl.

Old Agency got its name from the old Cheyenne River Sioux Agency that was located in this general area. The agency was abandoned in the late 1800's and a small community developed in the area. Residents were relocated to the town of Eagle Butte, approximately 65 miles to the west as the community was inundated during the filling of Lake Oahe.

Facilities in this area include picnic tables, shade shelters and vault toilets - all of which are located above elevation 1620.

Visitor Use. Visitor use of this recreation area is moderate to low. This area does receive some use for picnicking, shoreline fishing, and primitive camping. Visitors originate from Dewey County with very few coming from other counties in the State. This is one of the oldest areas on the Cheyenne River reservation.

Several attempts have been made to establish woody vegetation in this management area but only some attempts have been successful. The low moisture and poor soils contribute to the poor survivability of trees growing away from the shoreline.

Resource Objectives

- Provide lake access for boating and fishing
- Upgrade the quality of wildlife habitat along the shoreline for both upland and waterfowl species
- Preserve, monitor, and protect any cultural resources

Development Needs

- Plant trees and native species to improve the cover near the shoreline
- Plant shoreline vegetation where feasible to control erosion and to improve the overall esthetic quality of the area
- Construct vault toilets, shade shelters, fire pits.

Rationale. The Old Agency Park has some potential for additional development. The Cheyenne River Sioux Tribe has begun to develop plans for this area and adjacent tribal lands. The organized development of limited facilities would lessen the potential negative impact on wildlife habitat in the area. As such, this area supports a land use classification of Multiple Resource Management: Recreation - Low Density.

FOREST CITY RECREATION AREA

Management Unit. MU #97

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Forest City Recreation Area lies on the west shore of Lake Oahe, west of U.S. Highway 212. Access to the area is directly from the highway via a 1-mile long dirt road that is usable only in dry weather.

Description. The topography of this 40-acre management area is rolling hills to nearly level at the shoreline. There are sizeable sandy beaches in the small embayment near the boat ramp. Mixed grasses predominate. Shelterbelts of green ash, elm, ponderosa pine, cedar, and Russian olive and been planted. Native cottonwood and willow can be found growing along the shoreline.

Wildlife is somewhat limited. Occasional mule deer inhabit the area. Pheasant and rabbit can also be found. Both upland birds and waterfowl come to this area to migrate as well as nest. Bald eagles use the standing trees along the shoreline as roosts when following the migrating flocks of waterfowl. CRST does have a buffalo pasture adjacent to this area.

Recreation facilities in this area are limited and most are located above elevation 1620 feet m.s.l. These facilities include a vault toilet and shade shelters. The Corps facility includes a 2-lane boat ramp that is operated and maintained by the Tribe. Primitive camping is popular.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. Visitation to this recreation area is low. The majority of visitors come from both Dewey and Potter Counties. Recreational use of the area includes fishing from shoreline and boat with walleye the primary catch. Some hunting also takes place.

.Resource Objectives.

- Provide resource-oriented development
- Provide lake access for boating and fishing
- Provide facilities for primitive camping
- Upgrade the quality of habitat for wildlife
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Develop all-weather access roads
- Improve and upgrade existing day use facilities
- Designate and develop a small campground
- Plant additional trees and native species to increase and improve habitat and food source for wildlife

Rationale. The Forest City Recreation Area should be maintained as a lake access point with limited facility development. The potential for upland game hunting exists as additional wildlife habitat is improved. The organized development of limited facilities would lessen the potential negative impact on wildlife habitat in the area. A land use classification of Multiple Resource Management: Recreation - Low Density is appropriate for the Forest City Recreation Area because of the relatively low visitation, the current wildlife management program and the wildlife and resource orientation of traditional use.

Special Site Conditions. Because of the location of the boat ramp, it is greatly susceptible to littoral drift. Many times, the large quantity of sediment deposited on the ramp and at the mouth of the bay makes ingress and egress to the lake nearly impossible. Care should be taken to ensure that the silt on the ramp is removed on a regular basis. Sediment removal should be timed to limit the impacts on endangered species in the area.

STOVE CREEK AREA

Management Unit. MU #98

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Stove Creek Area is a 20-mile long management area is located between the Forest City Recreation Area and the headwaters of Albert's Creek Bay in Dewey County. Access is primarily by water although a few back-country dirt trails do exist.

Description. The topography of this 1,239-acre management area is rough rolling breaks with Pierre shale outcroppings (slick spots) with prickly pear and sage. The upland area has grasses consistent with native shortgrass prairie – western wheatgrass, blue grama, sideoats grama, green needlegrass, and buffalograss. Small stands of little bluestem can be found in isolated areas. Woody vegetation is limited. There are small stands of green ash in some draws with snowberry concentrated in the lower drainages. Skunkbrush mostly is found scattered on east and north facing slopes. Cottonwood and willow can be found along the shoreline.

This area provides habitat for mule deer and a few pronghorn. Sharp-tailed grouse are common with some pheasant also found. Several prairie dog towns are located in the southern portion of this management area. A State-designated waterfowl refuge is located on the water adjacent to a portion of this management area. This water-line refuge is closed to hunting.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Stove Creek Area is managed for the benefit of a variety of wildlife species. Some trees have been planted in some of the upland areas, but survivability has been poor because of the poor soils and lack of moisture. Some hunting does take place in the area with the primary game being mule deer and grouse. Fishing and trapping is also performed in those areas that allow relatively good access.

Resource Objectives.

- Upgrade the quality of the upland game habitat
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Plant trees and shrubs to increase winter cover, woody vegetation, and dense nesting cover and provide fisheries biomass
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Stove Creek Area because it serves as habitat for a variety of wildlife. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

MANY CREEKS AREA

Management Unit. MU #99

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Many Creeks Area is located in Dewey County and extends from the headwater of Albert's Creek Bay to the Rousseau Recreation Area. The area is hard to access because it is off the main road roughly 15 miles south of BIA Route #8. Access to the area is primarily by boat although some dirt trails do exist.

Description. The topography of the 3,363-acre Many Creeks Area is characterized by rugged breaks with severe cutbanks along the shoreline. The many creeks entering this management area all carry heavy silt loads from their respective drainage area. There are many Pierre shale slick spots on the south and west facing slopes. These areas contain both sage and prickly pear cactus. Mixed prairie grasses predominate in the remaining areas. These grasses include western wheatgrass, blue grama, sideoats grama, green needlegrass, buffalograss and some little bluestem. Woody vegetation is limited to the draws. In these areas, small stands of green ash, chokecherry, plum, juniper, and snowberry can be found with scattered skunkbrush thickets.

Big game species are plentiful in this management area. Mule deer and pronghorn both reside here. Sharp-tailed grouse also are known to frequent the area. Several species of hawks can be found. Furbearer populations are high. These include coyote, badger, raccoon, beaver, and some fox.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The Many Creeks Area is managed for the benefit of a variety of wildlife species. Trees are few in the area. Survivability is poor because of the poor soils and lack of moisture. Hunting does take place in the area with the primary game being mule deer, pronghorn, coyote, and grouse. Fishing and trapping are also performed in those areas that allow relatively good access.

Resource Objectives.

- Upgrade the quality of the upland game habitat
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Plant trees and shrubs to increase winter cover, woody vegetation, and dense nesting cover
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the Many Creeks Area because it serves as habitat for a variety of wildlife. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

ROUSSEAU RECREATION AREA

Management Unit. MU #100

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This 51-acre area is located on the north shore of the Cheyenne River Arm, 6 miles northeast of the Minneconjou Recreation Area. Access from U.S. Highway 212 is by 5 miles of paved BIA Road 8 and 15 miles of gaveled BIA Road 803. Access from the west is by a 17-mile gravel road (BIA Road 9) from SD Highway 63 then a 15-mile gravel road (BIA Road 803).

Description. The terrain in the northern portion of the Rousseau area is a flat plateau that gradually slopes down toward the shoreline. On the southern end, the area is steep with some cutbanks. Sand dropseed and prairie sandreed are found on the lower elevations. Grasses in the upland areas consist of blue grama, sideoats grama, western wheatgrass, green needlegrass, and some buffalograss and little bluestem. Forbs in the area consist of wild rose, leadplant, and wild licorice. Woody vegetation is limited to the lower elevations where Rocky Mountain juniper, American elm, chokecherry, plum and some Russian olive can be found.

Excellent habitat is available for pronghorn, mule deer, sharp-tailed grouse and occasional white-tailed deer. A prairie dog town is located in the northwestern portion of this management area. Bald eagles, golden eagles, and a variety of raptors inhabit or migrate through the area.

The recreation facilities found in this area include picnic tables, grills, shade shelters, and vault toilets. A gravel beach and swimming area can also be found. There is a cost shared boat ramp and new vault toilets in this area now. The boat ramp is the only facility that is below the 1620 m.s.l. elevation within the recreation area.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. Although visitation to the area is low, this area is popular with family groups from Eagle Butte, other small communities within the Cheyenne River Reservation as well as Rapid City, Sturgis and Lead. Activities enjoyed include picnicking, swimming, camping, and hiking. Boating and shoreline fishing is very popular with walleye the most sought-after species. Some northern pike, perch, crappie, white bass, and catfish are also taken.

At one time, an extensive tree planting program was undertaken in the Rousseau area. Many different species of trees were planted in the hopes of greatly increasing the amount of woody vegetation. However, because of the lack of moisture and the poor soils in the area, survivability of these trees was marginal, at best.

Resource Objectives (for the Corps-managed areas only)

- Provide lake access for swimming, boating and fishing
- Upgrade the quality of wildlife habitat along the shoreline for both upland and waterfowl species
- Provide resource-oriented development
- Preserve, monitor, and protect any cultural resources

Development Needs (for the Corps-managed areas only).

- Plant trees and food plots to improve the cover near the shoreline as a supplemental food source for wildlife
- Plant shoreline vegetation where feasible to control erosion and to improve the overall esthetic quality of the area

Rationale. This area is classified as Multiple Resource Management: Recreation - Low Density because it reflects the level of development and use on adjacent land. Rousseau Creek Recreation Area is a major component of the Cheyenne River Sioux Tribe's plans for recreation development. Additional facilities would provide for the potential increased use of this attractive area.

NORTH CHEYENNE AREA

Management Unit. MU #101

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area extends from the Rousseau Recreation Area westward to include all project lands on the north side of the Cheyenne River army. It includes lands in both Dewey and Ziebach Counties. Access to the area is limited to boats and a few unimproved dirt trails. This is the southern-most management area that lies within the external boundary of the Cheyenne River Sioux Tribe.

Description. The topography of this 3,584-acre acre management area is steep and rugged in the east with some cutbanks. Moving westward, there is a gradual transition to a typical flat flood plain with an extensive bottomland forest. Grasses in the upland areas consist of blue grama, sideoats grama, western wheatgrass, green needlegrass, and some buffalograss and little bluestem. Forbs in the area consist of wild rose, leadplant and wild licorice. Woody vegetation is limited to the lower elevations and consists of Rocky Mountain juniper and eastern red cedar. Isolated plum, sumac, and snowberry thickets are found throughout. Cottonwood and willow primarily are found growing along the upper portions of the Cheyenne River. During low water scenarios this area returns to river conditions and tremendous vegetation develops on the exposed shoreline. This area needs to be monitored for noxious weeds.

Big game species residing in this management area include mule deer, white-tailed deer, and some pronghorns (especially in the eastern half). Upland game birds including sharp-tailed grouse and some prairie chicken are also found. Coyote, fox, jack rabbit, cottontail rabbit, and beaver are all known to frequent the area. This management area is also used by golden eagles, bald eagles and waterfowl during migration times.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The North Cheyenne Area is managed for the benefit of a variety of wildlife species. Shoreline fishing along the Cheyenne River is a primary activity undertaken in this management area. The western half of the area has a somewhat more accessible shoreline.

Some hunting does take place within this management area with the primary game being deer and grouse. Trapping is also performed in those areas that allow relatively good access.

Resource Objectives (for the Corps-managed areas only)

- Provide lake access for boating and fishing
- Upgrade the quality of wildlife habitat along the shoreline for both upland and waterfowl species
- Protect any state or federally listed threatened and endangered species that may periodically use the area
- Control noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs (for the Corps-managed areas only).

- Plant trees and food plots to improve the cover near the shoreline as a supplemental food source for wildlife
- Plant shoreline vegetation where feasible to control erosion and to improve the overall esthetic quality of the area
- Use management techniques to control noxious weeds
- Manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the North Cheyenne Area because it serves as habitat for a variety of wildlife. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, or food plots.

AEBER CREEK LAKE ACCESS

Management Unit. MU #102

Classification. Multiple Resource Management: Future Recreation Area

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. Aeber Creek Lake Access is located on the north side and near the mouth of Aeber Creek. Access is by gravel road off of BIA Road 9. This road also serves as access to the original Tri- reatment plant

Description. This 7-acre area has gently sloping topography towards the water when the lake elevation is low. Vegetation is a mixed grass prairie with limited woody vegetation on the exposed shoreline. The area has been used as a temporary access site for CRST work crews. Area wildlife include mule deer, pronghorns, and some upland birds, primarily pheasants and grouse.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Visitor Use. This area provides a shoreline access for people in the immediate area and Eagle Butte. Visitation is low because of the lack of facilities and could benefit from the addition of vault toilets, shade shelters and a boat ramp. However, the area does receive considerable use during the summer especially on holiday weekends.

Resource Objectives (for the Corps-managed areas only)

- Provide lake access for boating and fishing
- Upgrade the quality of wildlife habitat along the shoreline for both upland and waterfowl species
- Preserve, monitor, and protect any cultural resources

Development Needs (for the Corps-managed areas only).

- Plant trees and native species to improve the cover near the shoreline as a supplemental food source for wildlife
- Plant shoreline vegetation where feasible to control erosion and to improve the overall esthetic quality of the area

Rationale. The lands of the Aeber Creek Lake Access above elevation 1620 m.s.l. was transferred to the Cheyenne River Sioux Tribe. Development of future park facilities, including a

much-needed boat dock, will be at the discretion of the tribe. However, the organized development of facilities would lessen the potential negative impact on wildlife habitat in the area. The Corps resource objectives and development needs are consistent with its limited role in the management of this area. Although there are no facilities in this area at this time, this area has the potential for becoming a recreation area in the future. Thus, the classification of Multiple Resource Management: Future Recreation Area is appropriate. Until that time, the area will continue to be managed for wildlife purposes.

SOUTH CHEYENNE AREA

Management Unit. MU #103

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The South Cheyenne Area extends from the western limit of the Oahe project lands along the south side of the Cheyenne River east to the Foster Bay Recreation Area. This management area lies in both Haakon and Stanley Counties. Access is by SD Highway 63 and a few dirt trails leading from county roads. Access is difficult because of the rough terrain.

Description. The topography of this 1,885-acre management area varies. The western portion of the area is typical floodplain, whereas the eastern portion is characterized by rough breaks and steep eroding cutbanks. Upland vegetation is composed of short mixed grasses, primarily western wheatgrass, blue grama, sideoats grama, and little bluestem. Prairie cordgrass predominates in the floodplain. Significant cottonwood and willow stands are located in the bottomland riparian areas. Cottonwood and willow are also found in some of the woody draws along with Rocky Mountain juniper, eastern red cedar, and snowberry. Woody vegetation on the upland area is limited to isolated cedars and snowberry.

This area primarily supports populations of white-tailed deer and some mule deer. Small game birds including pheasant, sharp-tailed grouse, and some Gray partridge also reside in the area. A variety of raptors such as bald eagles, golden eagles, hawks, and occasional osprey may be seen during periods of waterfowl migration. Cottontail rabbit, jackrabbit, and occasional bobcat have been seen in this management area.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. The South Cheyenne Area is managed for the benefit of a variety of wildlife species. Some hunting does take place within this management area with the primary game being deer, pheasant, and grouse. Trapping is also performed in those areas that allow relatively good access.

Fishing along the Cheyenne River is a primary activity undertaken in this management area with considerable shoreline fishing taking place. The western half of the area has a somewhat more accessible shoreline. The most sought-after species are walleye and catfish with some white bass and northern pike also taken.

Resource Objectives.

- Upgrade the quality of the upland game habitat
- Promote ecological integrity by controlling noxious weeds
- Preserve, monitor, and protect any cultural resources

Development Needs.

- Supplement native food sources for upland and big game species
- Plant trees and shrubs to increase winter cover, woody vegetation, and dense nesting cover
- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to the South Cheyenne Area because it serves as habitat for a variety of wildlife. Some of the area is suitable for additional wildlife plantings such as trees, shrubs, other native species that are drought tolerant

SANSARC CREEK AREA

Management Unit. MU #104

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. The Sansarc Creek Area is located in Stanley County, South Dakota. This area lies between the Foster Bay Recreation Area on the west and the Minneconjou Recreation Area on the east. Access to the area is limited to boats only.

Description. This 953-acre area is extremely rugged with steep breaks and severe cutbanks. The many shale outcroppings present are dominated by yucca and prickly pear cactus. The woody draws contain stands of snowberry and sumac with limited amounts of chokecherry, plum, and occasional cedar and juniper. Vegetation in the draws is primarily mixed grass species.

Mule deer and some white-tailed deer and pronghorns reside in this area. Furbearers including coyote, raccoon, fox, badger, beaver, and occasional bobcat are known to frequent the area. Several sizable prairie dog towns are located within the Sansarc Creek Area. A variety of raptors including bald eagles and several species of hawks can also be found.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed to improve the quality of habitat for big game species by increasing the amount of woody vegetation and winter cover. This is accomplished by planting cottonwood, willow, and green ash in accessible areas where soils are suitable. Some trees have been planted in some of the upland areas, but survivability has been poor because of the poor soils and lack of moisture. Hunting for big game species does occur in this area. Fishing is also popular in that portion of the lake adjacent to this management area.

Resource Objectives.

- Upgrade the quality of habitat for big game species
- Maintain, protect, and monitor cultural resources

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Establish food plots at lower elevations to supplement existing food sources for big game and other wildlife species

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species. The area is suitable for additional wildlife plantings.

AGENCY CREEK AREA

Management Unit. MU #105

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area is located in Stanley County, South Dakota and extends from the Minneconjou Recreation Area in the northwest to the Chantier Creek Recreation Area in the south. Access to the area is mostly by boat although a few backcountry trails do exist.

Description. The topography of the 2,124-acre Agency Creek Area is characterized by steep river breaks with some severe cutbanks. All of the small Missouri River tributaries running through this management area carry a heavy sediment load as a result of heavy grazing pressure on adjacent (off-project) lands. From the mouth of the Cheyenne River to "Combine Point" north of Chantier Creek, there are expansive sandy beaches in many of the embayments because of the sediment deposition occurring at the mouth of the tributaries.

Grass species in this management area are primarily western wheatgrass with some stands of sideoats grama, green needlegrass, buffalo grass, and blue grama. Cedar, green ash, American elm and limited stands of bur oak are found in the draws. Scattered thickets of chokecherry, plum, sumac, and snowberry are found throughout the area. Cottonwood and willow are found along the shoreline.

Big game species are prevalent in this management area. Mule deer, white-tailed deer, and pronghorns all reside in the many draws and embayments. Sharp-tailed grouse, prairie chicken, and some pheasant also inhabit the area. Furbearers including coyote, fox, and an occasional bobcat are known to frequent the area. A variety of raptors can be found within this management area during migration times and include bald eagles, several species of hawks, and an occasional peregrine falcon. The Mission Creek area supports one of the highest concentrations of least tern and piping plover nesting sites in the southern third of Lake Oahe.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed to improve the quality of habitat for big game species by increasing the amount of woody vegetation and winter cover. This is accomplished by planting cottonwood, willow, and green ash in accessible areas, where soils are suitable. Some trees have been planted in some of the upland areas, but survivability has been poor because of the poor soils and lack of moisture. However, one shelterbelt planted near Brush Creek on the point at the mouth

of the Cheyenne River is doing well. Hunting for big game species does occur in this area with the majority of the hunting access by boat. Fishing is also popular in that portion of the lake adjacent to this management area.

Resource Objectives.

- Maintain the quality of habitat for big game species
- Maintain, protect, and monitor the cultural resource sites located in the area
- Protect any State- or federally listed threatened and endangered species that may periodically use the area

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries
- Manage vegetation for optimum use by threatened and endangered species

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

TWIN BAYS AREA

Management Unit. MU #106

Classification. Multiple Resource Management: Wildlife Management

Management Agency. Corps of Engineers (below elevation 1620 feet m.s.l.)

Location. This management area, located in Stanley County, South Dakota, extends from the Chantier Creek Recreation Area east to near the emergency spillway. Access to the area is by backcountry trails leading from SD Highway 1806.

Description. The terrain of this 294-acre management area is characterized by steep eroding shale breaks with some severe cutbanks. Vegetation is primarily mixed prairie grass with isolated cedar stands scattered throughout the area.

The Twin Bays Area is home to both mule deer and white-tailed deer. However, the northern portion of this management area contains more mule deer, while the southern portion contains more white-tailed deer. Upland game species include sharp-tailed grouse and prairie chicken with limited numbers of pheasant and partridge. Furbearers residing in the area include coyote, fox, raccoon, badger, and an occasional bobcat. Migratory waterfowl are known to overwinter in the bays. As a result, golden eagles and bald eagles are both winter residents, feeding on the sick and old waterfowl.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This management area is used for hunting big game species including both mule deer and white-tailed deer. Upland game species are also sought. Many locations in this area have limited access because of the rough terrain.

Some tree plantings have been attempted in the upland areas to increase the amount of woody vegetation. However, many of these attempts have been unsuccessful because of the lack of moisture and the poor soil conditions.

Resource Objectives.

- Provide and maintain quality and diverse habitat for area wildlife
- Maintain, protect, and monitor the cultural resource sites located in the area

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries

Rationale. A land use classification of Multiple Resource Management: Wildlife Management is assigned to this area because it serves as valuable habitat for upland and big game species.

EMERGENCY SPILLWAY AREA

Management Unit. MU #107

Classification. Project Operations

Management Agency. Corps of Engineers

Location. Located approximately five miles northwest of Pierre, this area consists of a very narrow strip of land running southeasterly from the emergency spillway to a point on the Missouri River downstream from Oahe Dam. The spillway is located approximately 1 mile west of the outlet works and ensures that unprecedented floods will not overtop the dam.

Description. This is a 512-acre constructed channel with steep side slopes. This channel area gradually slopes from the lake in the northern portion to the Missouri River in the south. In the north, vegetation is primarily Russian thistle, kochia, and curly dock while in the south, western wheatgrass, prairie cordgrass, and some green needlegrass is found. The small wooded portion of this management area is located on the southeastern end near the Missouri River and is comprised mostly of cottonwood and some willow. Downstream from the direct channel, two small ponds were developed for wildlife.

White-tailed deer and occasional mule deer are known to frequent the area. Small mammals including rabbit, squirrel, skunk, and raccoon can be found predominantly in the southern portion of this management area. Mourning doves are attracted to the small wet areas along the river. Numerous species of waterfowl use the ponds for rearing and feeding

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is maintained as an emergency spillway channel in case a portion of the reservoir would need to be evacuated in a short time. There is some big and small game hunting in the area in the fall.

Resource Objectives.

- Provide an emergency channel when necessary for the operation of the Oahe Dam/Lake Oahe project
- Promote ecological integrity by controlling noxious weeds
- Maintain, protect, and monitor the cultural resource sites located in the area.

Development Needs.

- Control noxious weeds
- Provide appropriate protection for any cultural resources

Rationale. The Emergency Spillway is appropriately classified for Project Operations. This area is used for an emergency channel when necessary for the operation of the Oahe Dam/Lake Oahe project.

WEST SHORE RECREATION AREA

Management Unit. MU #108

Classification. Multiple Resource Management: Recreation - Low Density

Management Agency. South Dakota Game Fish and Parks

Within this management unit, the Corps is retaining ownership of the land both above and below elevation 1620 feet m.s.l. to the water's edge. However, under the provision of Title VI, the entire unit is leased in perpetuity to the SDGFP. Under this provision, the Corps maintains fee ownership to lands necessary for project operations but may lease recreation associated with the dams. At this site, the right dam abutment is essential to the operation and maintenance of the project.

Location. The West Shore Recreation Area is located between the west end of the Oahe Dam and the east side of the emergency spillway. This management area also includes three discontinuous areas - the archery range, rifle range, and the ORV area. Access is from SD Highway 1806.

Description. The topography of this 572-acre management area is hilly with some steep north- and east-facing slopes. There are draws scattered throughout the area. In addition, there are several cutbanks with evidence of ongoing shoreline erosion.

Grassy vegetation primarily consists of western wheatgrass and green needlegrass with some little bluestem and crested wheatgrass. The woody draws contain green ash, hackberry, cedar, Rocky Mountain juniper, and some ponderosa pine and Russian olive. Shrub species of sumac, buffaloberry, currant, chokecherry, and plum can also be found.

Upland game birds are plentiful and include sharp-tailed grouse, pheasant, prairie chicken, and occasional Gray partridge. Both white-tailed deer and mule deer reside in the area. Furbearers are also numerous and include coyote, fox, raccoon, skunk, badger, and occasional bobcat.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Four public use areas make up the West Shore Recreation Area: the Boat Ramp Area, Archery Range, Rifle Range, and ORV Area. A brief description of each area follows.

Boat Ramp Area

This 346-acre area extends from the east side of the emergency spillway to the west side of Oahe Dam. Recreation facilities in this area include a 3-lane boat ramp, courtesy docks, paved parking lot, and vault toilet. A scenic overlook is located on a hill to the southeast of the boat ramp. The main users of the Boat Ramp Area are boaters and fishermen because the area is one of the main access points to the lake upstream from the dam. The area provides access for fishing, canoeing, and waterfowl, upland, and big game hunting. There is also some use of the area near the entrance to the Emergency Spillway for shoreline fishing.

Archery Range

The 3-acre Archery Range is located midway between the Emergency Spillway Channel and the Spillway Channel in a natural woody draw. Box elder, green ash, cedar, Rocky Mountain juniper, plum, chokecherry, sumac, and snowberry all can be found in the area. The Archery Range is open to the general public and receives considerable use from a local archery club. This same club sponsors several competitive shoots at various times of the year.

Rifle Range

The 15-acre Rifle Range is located just to the southeast of the Archery Range. This area is primarily used by local hunters to sight-in rifles as well as for pleasure shooting. Trees are nonexistent in the area. Grass species include western wheatgrass with some green needlegrass, buffalo grass, and blue grama.

ORV Area

The ORV Area has been developed in a 412-acre area located south of the Emergency Spillway. The western and northern portions of the area are characterized by shale breaks. The southern and eastern portions were the sites of an old gravel mine/borrow area. There is some natural cottonwood and willows being established in small ponds created from the borrow areas. Shelterbelt plantings and a food plot have been established along the southern edge of the area. This area is very popular with local ORV users. In addition, visitors to the Downstream Recreation Area also find this area an alternative to bike riding along the trails or highway.

Visitor Use. This area is only a day use area. Visitation to the West Shore Recreation Area is moderate-to-high. Most visitors come from the Pierre/Fort Pierre area. This area attracts visitors desiring to participate in boating and fishing activities. Salmon, walleye and northern pike are the most sought-after species. During June and July, the number of vehicles pulling boat trailers can exceeds the capacity of the parking area.

The archery range and rifle range are used by individuals and groups. Some small tournaments are held in these areas. The ORV area receives some local use from various clubs in the Pierre/Fort Pierre area as well as by visitors to the Downstream area.

Resource Objectives.

- Provide resource-oriented development
- Provide lake access for boating and fishing
- Maintain habitat for various wildlife species
- Protect, monitor and preserve the cultural resource sites

Development Needs.

- Improve access to allow shoreline fishing between the dam and the West Shore boat ramp
- Install signs and curb stops in parking area of archery range to prevent visitors from crossing the perimeter into the target areas
- Construct a breakwater to allow for easier ingress and egress of boats during windy weather
- Plant additional trees around the boat ramp and parking area to increase the amount of shade and shelter in the area
- Continue to improve the parking and staging area at the ORV area.
- Limit traffic behind the rifle range within trajectory fan
- Develop a series of best management practices for the operation of the archery and rifle ranges to include a lead abatement plan (rifle range only), berms, solid waste cleanup and compliance with all applicable safety regulations.

Rationale. The West Shore Recreation Area is the lake access point that is closest to the dam. Visitors to this area are primarily from Hughes and Stanley Counties. The land use classification of Multiple Resource Management: Recreation - Low Density is appropriate for this area because of the limited development and the nature of the activities enjoyed. The organized development of additional facilities would lessen the potential negative impact on area wildlife.

WEST SHORE WILDLIFE AREA

Management Unit. MU #109

Classification. Project Operations

Management Agency. Corps of Engineers
Within this management unit, the Corps is retaining ownership of the land both above and below elevation 1620 feet m.s.l. to the water's edge. Under the provisions of Title VI, the Corps maintains fee ownership to lands deemed necessary for project operations.

Location. The West Shore area is located on lands in Stanley County, South Dakota near the west abutment of the dam, and includes much of the land on both sides of the Emergency Spillway channel but excludes the ORV area, rifle range, and archery range. This area extends to the southern end of Lake Oahe project lands. Access to the area is via SD Highway 1806.

Description. The topography of this 3,540-acre area is gently rolling to flat. The western portion contains steep breaks that flatten to the shoreline in the east. Bare shale spots are present within the western area.

Primary grass species in the area are western wheatgrass, blue grama, sideoats grama, and green needlegrass. In the lower drainages prairie cordgrass, yellow sweet clover, kochia, and Russian thistle can be found. In the shale areas yucca, sage, and prickly pear cactus are found.

Woody draws contain Rocky Mountain juniper, eastern red cedar, American elm, hackberry, and a remnant population of quaking aspen. Cottonwood and willow species are abundant along the shoreline with understories of snowberry and sumac.

Wildlife species in the area include mule deer, white-tailed deer, and occasional pronghorn. Upland game birds include sharp-tailed grouse, prairie chicken, pheasant, and occasional partridge. Migratory waterfowl are known to concentrate in the portion of the Missouri River during the winter because of the availability of open water and nearby food sources. The tall cottonwoods also provide good winter roosting habitat for bald eagles and golden eagles.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Area Use. This area is managed for the benefit of a variety of wildlife species. Tree and shrub plantings have been extensive and include species such as Siberian elm, lilac, cotoneaster, apricot, chokecherry, plum, sand cherry, Nanking cherry, silverberry, Russian olive, buffaloberry,

cedar, juniper, ponderosa pine, and honey locust. Food plots are located throughout the area and include milo, corn, sorghum, and sunflower. Stands of dense nesting cover of tall wheatgrass, big bluestem, switchgrass, Indian grass, sweet clover, and alfalfa have all been planted to increase the upland game habitat.

There is considerable recreational use of this wildlife management area. The other activities include mountain biking, nature study and photography. Big game, upland game, and waterfowl hunting all take place. Fishing (both from boats and the shoreline) is a popular activity as well. Catches include walleye, white bass, rainbow and brown trout, salmon, small-mouthed bass, and northern pike.

Resource Objectives.

- Accomplish flood control and maintenance of the project
- Maintain the operational integrity of the dam and related facilities
- Manage vegetation resources in a manor best suited to the operational needs of the area
- Promote ecological integrity by controlling noxious weeds
- Upgrade the quality of habitat for a variety of wildlife species
- Maintain, protect, and monitor the cultural resource sites located in the area
- Strive to improve potential environmental impacts from the operation of the project

Development Needs.

- Manage vegetation for optimum use of wildlife and fisheries when water returns
- Establish food plots to supplement existing food sources for waterfowl, big game, and upland game species
- Provide parking areas for hunting and other uses to protect the environmental integrity of the area.

Rationale. A land use classification of Operations is assigned to this area because the facilities located here are essential for the operation and maintenance of the Oahe Dam/ Lake Oahe project. Operation of the project and promoting safe practices are the primary aspects of management of this area. However, compatible public use is supported.

DOWNSTREAM RECREATION AREA

Management Unit. MU #110

Classification. Recreation

Management Agency. South Dakota Department of Game, Fish and Parks
Within this management unit, the Corps is retaining ownership of the land both above and below elevation 1620 feet m.s.l. to the water's edge. This site is adjacent to the dam and spillway channel and is essential to the operation and maintenance of the project. However, under the provision of Title VI, the entire unit is leased in perpetuity to the SDGFP. Under this provision, the Corps maintains fee ownership to lands necessary for project operations but may lease recreation associated with the dams.

Location. This recreation area is located downstream from Oahe Dam, primarily on the right bank. The Spillway Channel divides the recreation area into two portions. Access is from SD Highway 1806.

Description. The Downstream Recreation Area covers 456 acres and provides the greatest variety of recreational opportunities available in one location on Lake Oahe. The land is generally flat and contains remnants of the extensive floodplain forest that was common along the Missouri River. Western wheatgrass is the primary grass species present although some invader species such as brome are becoming established. Mature stands of cottonwood and willow are found throughout this area. In addition, apple, apricot, plum, Siberian elm, cedar, ponderosa pine, lilac, honeysuckle, honey locust, Russian olive, and green ash have all been planted in and around the campground.

The cottonwood stands with clearings of mixed grasses provide habitat for white-tailed deer and numerous small animals including rabbit and squirrel. Fox, coyote, badger, mink, and bobcat are seen on occasion through the area. Both redheaded and downy woodpeckers as well as common flickers reside in this forested area. Bald eagles and golden eagles use the area for winter roosting because of the availability of open water and a plentiful food supply.

The CRMP has identified cultural sites in this area. Prior to any future development at or near this area, an evaluation must be made to determine if the development would affect any historic properties that may be eligible for the National Register or any Traditional Cultural Properties and the best way to avoid, minimize, or mitigate potential impacts.

Three public use areas make up the Downstream Recreation Area: Downstream North, Downstream South and Left Tailrace. A brief description of each area follows.

Downstream North

The Downstream North area is located immediately northeast of the Outlet Works Channel and extends northward. This area, consisting of cottonwood bottomland and marsh, offers a diversity of habitat and recreational opportunities.

Downstream North contains both day use and camping areas. Facilities in this area include a 2-lane boat ramp, courtesy dock, fish cleaning station, picnic area, group shelter, playground, horseshoe pits, swim beach, potable water, shower facilities, comfort stations, vault toilet, nature trail, and amphitheater. The two campground loops present contain designated pads both with and without electricity.

Oahe Marina, a direct concession lessee, provides marina facilities such as slips and fuel, bait and fishing supplies, convenience store, small restaurant, and cabin rentals. The lease was assigned to the SDGFP pursuant to Title VI.

The Cottonwood Path Nature Trail, located adjacent to the campground, is a self-guided trail with very little slope. It consists of two separate segments - one of 1 mile in length, the other of 1/2 mile in length. The trails wind through the bottomland/wetland areas along the Missouri River immediately downstream from the Oahe Dam.

Downstream South

The Downstream South area is located on the south side of the Outlet Works Channel and extends to near the downstream outlet of the Emergency Spillway Channel. This area also consists of cottonwood bottomland and marsh and offers a diversity of habitat and recreational opportunities.

Facilities located within this area include a camping area, group shelter, playground, potable water, vault toilet, and comfort station. This campground area is often used as a group camping area. In addition, there is considerable use of the shoreline area (outside of the designated campground) for camping activities.

This popular fishing area provides both shoreline and boat fishing opportunities and receives heavy use. Underwater spear fishing is also undertaken with several tournaments held in the late summer. Primary catches in the tailrace area include walleye, Chinook salmon, rainbow trout, brown trout, lake trout, small-mouthed bass, white bass, crappie, and catfish. A considerable amount of night-time fishing takes place as fish, primarily walleye and trout, move into the area to feed.

Tailrace Boat Ramps

The Tailrace boat ramps are used by a large percentage of the visitors to the Downstream North and Downstream South Areas. The launch ramp that is located on the right bank of the tailrace is used

very little. The ramp on the left bank receives considerably more use but does have a problem with silt deposition on the ramp. There is ample parking in both areas. Vault toilets are present in both areas.

Visitor Use. The entire Downstream Recreation Area is intensively developed and supports a wide variety of activities. Day use activities, camping, swimming, waterskiing, wind surfing, fishing, boating, picnicking, nature hiking, and wildlife viewing are all activities that visitors enjoy in this area.

Visitation to the Downstream Recreation Area is high. In 2006, this area accounted for 39.1 percent of the total project visitation. The majority of visitors to this recreation area come from Hughes and Stanley Counties, as well as other parts of South Dakota, the United States, and Canada.

Resource Objectives.

- Provide diverse recreational opportunities for resident and nonresident visitors
- Provide river access for boating, fishing, and other water-based activities
- Provide recreation facilities for day use and camping
- Provide interpretation of the natural and unique ecological resources found in the area
- Maintain, protect, and monitor the cultural resource sites located in the area
- Maintain the quality of habitat for area wildlife
- Provide river access for fishing and other water-based activities

Development Needs.

- Maintain the current activity diversity
- Upgrade and improve playground facilities
- Rehabilitate and upgrade the boat slips at the marina
- Install additional picnic tables in day use area
- Continue program of tree and shrub planting to improve wildlife habitat and provide natural diversity to the area
- Replace cottonwoods at a ratio of 4:1
- Install a fish cleaning table on the left bank of the Tailrace Area
- Install picnic tables and shade shelters in the Tailrace Area
- Install curb stops in the large parking lot
- Install another ADA accessible fishing structure

Rationale. The Downstream Recreation Area is a natural gravitation point for destination and non-destination campers and resident day users. The entire area features a wide array of recreational facilities, activities, attractions, open spaces, and wildlife resources.

The nearby project structures, such as the dam, powerhouse, and spillway, the powerhouse tours and displays; the access to Lake Sharpe; and the nearby access to Lake Oahe contribute to the diversity and quality of attractions that draw visitors to the Downstream Recreation Area. A land use classification of Recreation is appropriate for the Downstream Recreation Area because of the experienced high visitation, easy accessibility, the extensive development in the area, and the long-term suitability for intensive use.

CHAPTER 7
ENVIRONMENTAL OPERATING PRINCIPLES

#1. Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.

Collaborative efforts with Federal agencies and State and local governments are implemented wherever possible for development, management, and monitoring of resources at Corps reservoir projects.

Sustainable development is ensured into the future through environmental stewardship epitomized by resource objectives identified for each area in the master plan, and development needs that are consistent with these resource objectives.

Monitoring (including inspections) allows feedback to determine whether adaptive management efforts are needed to ensure the balanced human environment envisioned in the master plan and supported by the EA. Water quality monitoring is conducted in general areas by the Corps and near beaches by State or local entities managing the recreation area where the beach is located. The Corps multidisciplinary staff conducts periodic inspections of each area, structure, and facility used to operate and maintain the project to ensure management and development activities are in accordance with Corps-approved plans and current regulations. These plans include Annual Management Plans and longer-term management plans prepared by lessees for specific areas and the Corps' project-wide OMP.

The master plan identifies the most sustainable water resource system among several alternatives. These are based on contribution to the objectives of society (regional plans/needs and expressed public desires) now and in the future (forecasted for the next 15 to 20 years) that maintains their ecological, environmental, and hydrological integrity (consistent with project purposes, the National Environmental Policy Act, and other laws and regulations).

The master plan includes historic, current, and forecasted future environmental and economic considerations. The plan discusses various resource objectives and development needs that must improve the quality of life by meeting regional recreational needs while protecting biological, geological, cultural, and historical resources. Planning (master plan updates), design and construction (site-specific EA requirements for development proposals), and operation and maintenance (inspections to ensure compliance with the terms of real estate instruments and other Corps regulations) function in an integrated manner to ensure maximum quality of life for present and future generations.

#2. Recognize the interdependence of life and the physical environment, and consider environmental consequences of Corps programs and activities in all appropriate circumstances.

In the master plan, the Corps considers the interrelationships among all the factors, including activities of humans, habits and habitats of fish and wildlife, and abiotic factors, in determining the most suitable land classification and types and levels of development (if any) for each area of the reservoir project.

The master plan identifies a number of important values of freshwater ecosystems in the reservoir project and considers them all in the planning process. The reservoir is a valuable source of drinking and irrigation water. One of the project-wide resource objectives is to maintain a high quality water supply for irrigation, water supply, recreation, fish and wildlife use. The master plan discusses the great value of the reservoir area for food production: hunting, fishing, and trapping; agricultural and grazing activities; wildlife food plantings; and predator-prey relationships. The master plan explains that the reservoir benefits employment in the region through recreation-related commercial enterprises on and off reservoir project lands, during both the construction and operation phases.

The EA expressly considers the environmental consequences of: proposed land uses; proposed development of recreation facilities and wildlife habitat; and anticipated activities of humans, fish, and wildlife. These consequences are considered from both the scientific perspective (using the latest scientific data and latest projections of population and recreation activity participation) and legal perspective in both the master plan and EA as well as in the Operational Management Plan.

The master plan strives to secure adequate information on the environmental consequences of all reasonable alternatives to objectively assess them in the decision process to identify the most appropriate land classifications and the most suitable types and levels of development for all areas of the reservoir project

<u>#3. Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.</u>

Several resource objectives and development needs seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce each other. For example, several MU's balance supporting human uses and wildlife resources. At MU's that have shoreline erosion problems, natural erosion measures such as planting vegetation and anchoring logs and snags to the shore are proposed rather than riprap.

<u>#4. Continue to accept corporate responsibility and accountability under the law for activities and decisions under Corps control that impact human health and welfare and the continued viability of natural systems.</u>

The Oahe Master Plan EA fulfills requirements of the National Environmental Policy Act of 1969 (NEPA, 42 U.S.C. 4321-4347), which establishes a national policy to "…encourage productive and enjoyable harmony between man and his environment; promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; enrich the understanding of ecological systems and natural resources important to the Nation…" The Oahe Master Plan EA fulfills NEPA by describing the existing environmental conditions, including air quality, water quality, vegetation, fish and wildlife, and threatened and endangered species and evaluating the effects of the master plan on the environment.

The EA ensures that the Oahe Master Plan is also in compliance with other applicable environmental and cultural resource laws and executive orders, including the Clean Air Act, Clean Water Act, Endangered Species Act, Archaeological Resources Protection Act, Fish and Wildlife Coordination Act, among others, as discussed in the EA.

In addition, the Oahe project accepts corporate responsibility and accountability for following Federal laws because project staff completes a NEPA checklist for any ground-disturbing activity such as the installation of a vault toilet or parking lot. Project staff also follows procedures in the Lake Oahe Cultural Resources Management Plan in order to comply with cultural resources laws and have developed an Environmental Management System (EMS), which ensures that employees are aware of the environmental laws and values affecting the project.

The master plan fulfills stipulations of the Final Programmatic Agreement for the Operation and Management of the Missouri River Mainstem System for Compliance with the National Historic Preservation Act, as amended (USACE 2004). The management unit descriptions ensure the Corps follows the stipulation that we adhere to the Lake Oahe Cultural Resources Management Plan. This ensures that any potential development activities will avoid impacting cultural resources. Each management unit also has as a resource objective to preserve, monitor, and protect any cultural resources and as a development need to Provide appropriate protection for any cultural resources. The master plan follows the stipulation that any affected Tribes be provided the opportunity to participate in the development and implementation of management plans. Representatives of both the Cheyenne River Sioux Tribe and Standing Rock Sioux Tribe have had the opportunity to comment on the development of this master plan.

<u>#5. Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.</u>

The cumulative impacts to the environment resulting from visitation to Corps project recreation areas will be mitigated. Recreation areas usually have as a resource objective and development need the creation of wildlife habitat in appropriate areas. In addition, project staff will evaluate the construction of any new recreation facilities under NEPA to see if they are categorically excluded from further analysis or if they require an environmental assessment to determine their impact on the environment. Site-specific proposals for development will also be offered to the

Tribes for consultation, in accordance with the PA. The Corps and non-Federal lessees will manage recreation areas in accordance with pertinent environmental laws, the EMS, and the EOP's, which will help reduce some of the wildlife and vegetation impacts to the area from human disturbance.

#6. Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.

As noted under EOP #4, the Oahe project staff has developed an EMS, which is a series of management processes and procedures that allow an organization to identify, mitigate, control, and reduce any environmental impacts from the organization's day-to-day business activities, to be in compliance with Executive Order 13148. The Corps has developed an environmental policy statement; developed a plan for system implementation; completed a list of environmental aspects and impacts; established objectives, targets, and programs; conducted EMS awareness training; and completed a management review of the EMS. Oahe project staff has developed and implemented an EMS plan which addresses these requirements. The EMS supports a greater understanding of the environment and impacts of our work.

The Oahe project staff coordinates extensively with other agencies and organizations to develop integrated scientific, economic, and social knowledge bases that support a greater understanding of the environment and impacts of our work. The Oahe project is working with Federal and State agencies to develop projects that will support the Biological Opinion for the Missouri River Recovery program. Project personnel also work with Federal, Tribal, State, and county agencies on the Lake Oahe Noxious Weed Task Force.

The Corps is active in educating the public about the environment and impacts of its work. One of the project-wide resource objectives at the Oahe project is to provide public education about the history of the area, Oahe project resources, and the Corps' role in developing and managing these resources. Specific resource objectives and development needs at the management units reflect this objective. For example, one of the development needs at the Moser Bay Area is to create a public awareness plan so people are aware of threatened and endangered birds if recreation activity increases. At Cattail Bay Recreation Area, one of the development needs is to interpret the local history of adjacent sensitive areas from the recreation area. Development needs at Beaver Creek Recreation Area and Four Mile Bay Area include the development of interpretive trails, and development needs at Winona Island Natural Area, Kenel Flats Area, Downstream Recreation Area, and Grand River Fisheries Management.

#7. Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment.

The Corps has been proactive in respecting the views of individuals and groups interested in the master plan. During the summer of 2007, the master plan team held workshops designed to gain local insights concerning use of the land base surrounding Lake Oahe. Additionally, public comment cards were available at several public locations around the lake providing an opportunity to ask questions or make comments concerning the use of the land base.

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CHAPTER 8
CONCLUSIONS

Oahe Dam was constructed between 1948 and 1963. It takes its name from the old Oahe Mission which was established by Reverend Thomas Riggs in 1874 to serve the Sioux Indians of the area. Lake Oahe, the reservoir impounded by Oahe Dam, extends approximately 230 miles from Oahe Dam, 6 miles north of Pierre, South Dakota, to near Bismarck, North Dakota. At normal operating pool (1617 feet msl), the lake covers 359,000 acres and has over 2,250 miles of shoreline.

Much of the western portion of the project lies within two Indian reservations. That portion of the project between the Cheyenne River and the Corson/Dewey County Line in South Dakota lies within the Cheyenne River Sioux Reservation. That part of the project from the Corson/Dewey County Line north to the Cannonball River in North Dakota lies within the Standing Rock Sioux Reservation.

Most of the visitors to the Oahe project are residents from the immediate surroundings, although significant numbers of visitors come from the larger communities of Sioux Falls, Watertown, Aberdeen, and Rapid City, South Dakota; Fargo, North Dakota; and Minneapolis, Minnesota.

Recreation sites are distributed around the lake. Most of the visitation is concentrated in the areas near the four highway crossings - the dam (near Pierre), SD Highway 212 (near Gettysburg), SD Highway 12 (near Mobridge), and ND Highway 10 (at Bismarck). However, because of the rugged terrain, inaccessible shoreline, and the distance from heavily populated areas, visitation is relatively low on the west side of the lake. The highest priority recreation facility needs for the entire project are upgraded day use facilities and campgrounds. This Master Plan designates areas where each of these needs should be met.

This master plan presents an overall plan for the management and development of the recreational, natural and cultural resources at the Oahe Dam/Lake Oahe Project. It also provides guidance on public use, natural areas, and cultural resources within the Oahe project boundaries. Preparation of this plan required (1) an appraisal of the natural and cultural resource conditions of the project and the surrounding region, and (2) an examination of environmental and administrative constraints and influences. Specific references to these factors can be found in the environmental assessment (exhibit A).

Sound stewardship of public lands requires development and management of project resources for the public benefit consistent with resource capabilities. An important element of this approach is the establishment of viable resource objectives. This master plan recommends a broad range of resource objectives and management and development concepts covering the overall project, as well as specific areas within it. These recommendations are summarized below.

PROJECT OPERATIONS LANDS

- Continue to ensure that all project purposes (flood control, navigation, hydropower, fish and wildlife, recreation, irrigation, and municipal and industrial water supply) are carried out.

RECREATION LANDS

- Maintain and/or improve existing recreation facilities administered by the Corps and provide safe, enjoyable recreation opportunities;

- Develop interpretive displays to identify and explain the natural, cultural, and historical significance of areas around the project; and

- Lease identified project lands to qualified non-Federal sponsors for facilities development and provide technical, advisory, and administrative support as needed.

MULTIPLE RESOURCE MANAGEMENT LANDS

- Promote ecological integrity by controlling noxious weeds;

- Develop, maintain, and/or upgrade facilities at low-density use areas to provide safe and enjoyable recreational experiences;

- Preserve and maintain existing riparian vegetation wherever possible; and

- Continue a vegetative planting program to improve wildlife habitat, visual quality, and shoreline stability.

ENVIRONMENTALLY SENSITIVE AREAS

- Preserve and protect unique and important ecological, cultural, and aesthetic resources.

An Operational Management Plan (OMP) is a critical element in achieving the resource objectives and associated management and development concepts specified in the Master Plan. The latest OMP for the Oahe project was approved in 1988. Revisions to that document are currently underway.

Extensive Federal, State, Tribal, and local agency coordination and citizen involvement was incorporated in all aspects of this Master Plan. Planning for the development, preservation, or enhancement of project resources will continue to be coordinated through other governmental

agencies and special interest groups to ensure the efficient and timely implementation of the resource objectives.

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CHAPTER 9
RECOMMENDATIONS

It is recommended that this master plan guidance be closely followed in managing the land and water resources at the Oahe project. The plans and policies within this master plan are consistent with authorized project purposes and resource capabilities and accommodate Federal, State, Tribal and local needs. They represent wise stewardship of resources and will result in increased opportunities for enjoyment of outdoor recreation activities.

The Corps will continue cooperating with Federal, State, Tribal and local interests to preserve, protect and improve the natural and man-made resources at the Oahe project as doing so, the project can provide improved outdoor recreation opportunities in both South Dakota and North Dakota for future generations of both residents and non-residents.

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CHAPTER 10
REFERENCES

American Sportfishing Association. 2001. "All Fishing 2001 State Overview." http://www.asafishing.org/asa/statistics/saleco_trends/state_allfish_2001.html. Accessed October 2006.

American Sportfishing Association. 2003. "All Fishing 2003 State Overview." http://www.asafishing.org/asa/statistics/saleco_trends/state_allfish_2003.html. Accessed May 29, 2007.

Ashton, Diane E. and Eileen M. Dowd. 1997. "Fragile Legacy. Endangered, Threatened and Rare Animals of South Dakota." South Dakota Department of Game, Fish and Parks, Report No. 91-04. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page .http://www.npwrc.usgs.gov/resource/distr/others/sdrare/sdrare.htm (Version 8DEC97).

Bailey, R.G. 1995. "Description of Ecoregions of the United States." http://www.fs.fed.us/land/ecosysmgmt/ecoreg1_home.html Accessed December 16, 2005.

Bangsund, D.A., and F.L. Leistritz. 2003. "Resident and Nonresident Hunter and Angler Expenditures, Characteristics, and Economic Effects, North Dakota, 2001-2002." North Dakota State University, Department of Agribusiness and Applied Economics. Obtained from: http://www.ext.nodak.edu/homepages/aedept/aemisc/pubtotallist1.htm#AE_REPORTS. Accessed June 7, 2007.

Carlson, R.E. 1977. **"**A Trophic State Index for Lakes." Limnology and Oceanography, March 1977, Vol 22(2), pp. 361-369.

Environmental Protection Agency (EPA). 2004. "Impaired Waters Listed by State." http://oaspub.epa.gov/waters/state_rept.control. Accessed July 5, 2007.

Grondahl, C. and K. Martin. 1997. "North Dakota's Endangered and Threatened Species." North Dakota State Game and Fish Department's Nongame Program, Bismarck, ND. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/wildlife/endanger/index.htm

Maka Foundation. 2007. "Black-footed Ferret Reintroduction." http://www.makafoundation.org/index.asp?menu=5. Accessed December 7, 2007.

Johnson, W.C. 1992. "Dams and Riparian Forests: Case Study from the Upper Missouri River." Rivers 3(4): 229-242.

NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.6. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. Accessed: December 19, 2005.

NCDC (National Climate Data Center). 2007a. "North Dakota Climate Normals." http://cdo.ncdc.noaa.gov/climatenormals/clim81/NDnorm.txt Accessed July 6, 2007.

NCDC. 2007b. "South Dakota Climate Normals." http://cdo.ncdc.noaa.gov/climatenormals/clim81/SDnorm.txt Accessed July 6, 2007.

NDDC (North Dakota Department of Commerce). 2006. Personal communication, Sara Otte Coleman regarding tourist expenditures in North Dakota, by email, October 10, 2006.

NDDH (North Dakota Department of Health). 2003. "A Guide to Safe Eating of Fish Caught in North Dakota. http://www.health.state.nd.us/wq/sw/Z7_Publications/B_2003FishAdvisory.pdf. Accessed July 5, 2007.

NDDH. 2006. North Dakota 2006 Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads. North Dakota Department of Health, Division of Water Quality, Bismarck, ND

NDDOT (North Dakota Department of Transportation). 2006. "Statewide Transportation Improvement Program, 2007-2010."

NDDT (North Dakota Department of Tourism). 2005. "Lewis and Clark Trail Attractions and Historical Markers. http://www.ndtourism.com/secondary/viewArticle.asp?ID=54 Accessed December 28, 2005

NDGF (North Dakota Game and Fish Department). 2003. "The State of North Dakota 2003-2008 State Comprehensive Outdoor Recreation Plan." Available at: http://www.parkrec.nd.gov/

NDGF. 2005. "North Dakota Statewide Aquatic Nuisance Species (ANS) Management Plan."

NDGF. 2006a. Email communication with Jeff Hendrickson, North Dakota District Fisheries Supervisor, regarding Oahe fishing report, October 23, 2006.

NDGF. 2006b. Email communication with Paul Schadewald, Chief, Administrative Services, regarding fishing license, hunting license revenue, October 2006.

NDGF. 2006c. Email communication with Janice Vetter regarding Oahe fisheries tournaments, October 10, 2006.

NDGF. 2008. "North Dakota's Aquatic Nuisance Species List." http://gf.nd.gov/fishing/ans-list.htiml . Accessed August 1, 2008.

NDNHP (North Dakota Natural Heritage Program). 2006. Personal communication with Christine Dirk. November 21, 2006.

NDPR (North Dakota Parks and Recreation Department). 2006. Personal communication with Donna Schouweiller, North Dakota Parks and Recreation Department, information on most visited North Dakota state parks, by email, October 6, 2006.

NDPR (North Dakota Parks and Recreation Department). 2009. Visitation Reports. Accessed September, 2010

North Dakota State Government. 2007. Office of Sales Tax Commissioner webpage. http://www.nd.gov/tax/ Accessed June 7, 2007.

Polling Report. 2006. USA Today/Gallup Poll. www.pollingreport.com/energy. Accessed June 2006.

Rumble, M.A., and Gobeille, J.E. 2001. "Small Mammals in Successional Prairie Woodlands of the Northern Great Plains." Res. Pap. RMRS-RP-28. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 9 p.

Rumble, M.A., and Gobeille, J.E. 2004. "Avian Use of Successional Cottonwood (Populus deltoides) Woodlands along the Middle Missouri River." American Midlands Naturalist 152:165-177.

SDDENR (South Dakota Department of Environment and Natural Resources). "The 2006 South Dakota Integrated Report for Surface Water Quality Assessment." Pierre, SD.

SDDH (South Dakota Department of Health). 2006. "Current South Dakota Fish Consumption Advisories." http://www.state.sd.us/doh/Fish/index.htm. Accessed July 5, 2007,

SDDOT (South Dakota Department of Transportation). 2006. "Statewide Transportation Improvement Program, 2007-2011."

SDDT (South Dakota Department of Tourism). 2006. "Statistical Update, Economic and Fiscal Impacts Associated with the Vacation Travel Industry in South Dakota, November 2004 through October 2005.

SDDT. Personal communication, Billie Jo Waara, information on tourism studies by email, October 12, 2006.
SDGFP (South Dakota Department of Game, Fish, and Parks). 2002. "South Dakota Statewide Comprehensive Outdoor Recreation Plan." Available at: http://www.sdgfp.info/Publications/

SDGFP. 2005. Personal communication, Doug Backlund, information on South Dakota threatened and endangered species, by email, December 21, 2006.

SDGFP. 2006a. Email communication with Andy Lindbloom, Region 2 Wildlife Manager, regarding waterfowl license and waterfowl number information, October 19, 2006.

SDGFP. 2006b. Personal communication by phone Jim Riis regarding fishing and hunting license revenue, excise tax revenue, October 24, 2006.

SDGFP. 2007a. Email communication with Kyle Potter, resource biologist, Missouri River Fisheries Center, regarding stocking of Lake Oahe, December 3, 2007.

SDGFP. 2007b. SDGFP website, prairie dog information. http://www.sdgfp.info/Wildlife/hunting/PrairieDog.htm Accessed February 8, 2007.

SDGFP. 2007c. Personal communication by email with Nancy Potts regarding hunting license revenue, June 12, 2007.

SDNHP (South Dakota Natural Heritage Program). 2002. Natural heritage program database.

Sovada, M.A. and Scheick, B.K. 1999. "Preliminary Report to the Swift Fox Conservation Team: Historic and Recent Distribution of Swift Foxes in North America." In: C.G. Schmitt (ed.) Annual Report of the Swift Fox Conservation Team. pp: 80-147. New Mexico Department of Game and Fish, Albuquerque, NM, USA.

South Dakota State Government. 2007a. Department of Revenue and Regulation. http://www.state.sd.us/drr2/revenue.html Accessed June 7, 2007.

South Dakota State Government. 2007b. Motor Vehicles Division. http://www.state.sd.us/drr2/motorvehicle/motorfuel/index.htm Accessed June 7, 2007.

Tallman, D.A., D.L. Swanson, and J.S. Palmer. 2002. "Birds of South Dakota," third edition. South Dakota Ornithologists' Union, Aberdeen, South Dakota. 441p.

USACE (U.S. Army Corps of Engineers). 1994. Master Water Control Manual Missouri River – Review and Update. Volume 7B: Environmental Studies, Reservoir Fisheries, Appendix C

Coldwater Habitat Model." July 1994. Missouri River Division.

USACE. 1995. Engineer Regulation (ER) 1110-2-8154, "Engineering and Design – Water Quality and Environmental Management for Corps Civil Works Projects." Department of the Army, U.S. Army Corps of Engineers, Washington, D.C.

USACE, Omaha District, Operations Division, Visitation reports

USACE. 2004. "Final Cultural Resources Management Plan, Lake Oahe, South Dakota." U.S. Omaha District.

USACE. 2005. National Inventory of Dams. U.S. Army Topographic Engineering Center http://crunch.tec.army.mil/nid/webpages/nid.cfm Accessed February 13, 2006.

USACE. 2006a. Annual visitation data, maintained by Operations Division, Omaha District.

USACE. 2006b. "Missouri River Mainstem Reservoir System Master Water Control Manual, Missouri River Basin." Northwestern Division – Missouri River Basin Reservoir Control Center, Omaha, Nebraska.

USACE. 2007. "Program Management Plan for Implementing the Omaha District's Water Quality Management Program." Omaha, NE.

USACE. 2008a. "Water Quality Special Report: Water Quality Conditions Monitored at the Corps' Oahe Project in South Dakota during the 3-Year Period 2005 through 2007." Report Number CENWO-ED-HA/WQSS/Oahe/2008. Hydrologic Engineering Branch, Omaha NE.

USACE. 2008b. 2"007 Report: Water Quality Conditions in the Missouri River Main Stem System." Hydrologic Engineering Branch, Omaha NE.

USACE. 2008c. "Program Management Plan for Implementing the Omaha District's Water Quality Management Program." Hydrologic Engineering Branch, Omaha NE.

U.S. Census Bureau. 2000. www.census.gov. Accessed May 25, 2007.

U.S. Census Bureau, Census 2006 Summary File

USDA (U.S. Department of Agriculture). 2002. National Agricultural Statistics Service website. "2002 Census of Agriculture State and County Profiles." http://www.nass.usda.gov/census/census02/profiles/index.htm Accessed December 15, 2005

USDA. 2006a. Economic Research Service website. State Fact Sheets: North Dakota. http://www.ers.usda.gov/StateFacts/ND.HTM Accessed October 15, 2006.

USDA. 2006b. Economic Research Service website. State Fact Sheets: South Dakota. http://www.ers.usda.gov/StateFacts/SD.HTM Accessed October 15, 2006.

U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. "2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation."

USFWS (U.S. Fish and Wildlife Service). 2000. "Biological Opinion on the Operation of the Missouri River Mainstem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System." Prepared in Coordination between Region 6 (Denver, Colorado) and Region 3 (Fort Snelling, Minnesota) USFWS staff.

USFWS and US Census Bureau, 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, North Dakota.

USFWS and US Census Bureau, 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, South Dakota.

USFWS. 2005. http://southdakotafieldoffice.fws.gov/endsppbycounty.htm

APPENDIX A

RECREATION AREAS TRANSFERRED UNDER TITLE VI

Name	Location
Peoria Flats RA	Northwestern Hughes County. This area is surrounded by the Peoria Flats Game Management Area. Access to the area is by a 4.5-mile gravel road leading from SD Highway 1804. Circulation throughout the area is by gravel road.
Spring Creek / Cow Creek RA	Roughly 15 miles northwest of Pierre in Hughes and Sully Counties. Access is by a paved road leading from SD Highway 1804.
Okobojo Point RA	Approximately 17 miles northwest of Pierre on the south side of the mouth of Okobojo Bay in Sully County. Access is by a 3-mile paved road leading from SD Highway 1804. Circulation within this recreation area is via all weather gravel roads.
Garrigan's Landing	West side of the upper reaches of Okobojo Creek in Sully County. Access to this area is by gravel road.
Pike Haven Lake Access	Adjacent to the Pike Haven Resort, just south of the Little Bend peninsula and 35 miles west of Onida, South Dakota. Access is by approximately 10 miles of gravel road from SD Highway 1804.
Little Bend RA	At the center of the Little Bend Peninsula on the southwest-facing slope. Access is by approximately 15 miles of gravel road from SD Highway 1804.
Bush's Landing RA	In Sully County approximately 35 miles north-northwest of Pierre and 30 miles west-northwest of Onida. Access to this area is by 9 miles of gravel road leading from SD Highway 1804.
Sutton Bay RA	In northwest Sully County, near the Sully-Potter County line approximately 18 miles west of Agar and 23 miles southwest of Gettysburg. Access is by a 4-mile long gravel road leading from SD Highway 1804.
Highway 212 Lake Access	In Potter County area, at the east end of the U.S. Highway 212 Bridge roughly 16 miles west of Gettysburg. This management area extends east for approximately ½ mile.
South Whitlocks Access Point	South of the mouth of Cheyenne Creek and is surrounded by the Harer Wildlife Area. Access is by section roads and a road through a nearby private resort.
East Whitlocks RA	East side of the Cheyenne Creek Bay in Potter County, approximately 15 miles west of Gettysburg. Access is via a 2-1/2-mile paved road from SD Highway 1804.
West Whitlocks RA	In Potter County on a peninsula on the west side of Cheyenne Creek Bay, 18 miles west of Gettysburg. Accessed by a paved road leading from SD Highway 1804.
Dodge Draw RA	Northwestern Potter County roughly 25 miles northwest of Gettysburg. Access is from an 11-mile road from U.S. Highway 83.
LeBeau Lake Access Area	Southwestern Walworth County, 2 miles north of the Potter/Walworth county line. Access is by a 10-mile gavel road leading from U.S. Highway 83.
Swan Creek RA	On the south side of Swan Creek in southwest Walworth County. It is approximately 9 miles west of Akaska and roughly 30 miles south of Mobridge. Access to the recreation area is by 11 miles of gravel road leading from U.S. Highway 83.
Bowdle Beach RA	Southwest Walworth County, roughly 30 miles west of the town of Bowdle and 10 miles northwest of Akaska. Access is by a 12-mile gravel road off U.S. Highway 83.

Walth Bay RA	West-central portion of Walworth County approximately 15 miles southeast of Mobridge and 20 miles southwest of Selby. Access is via a 1-1/2 mile all-weather gravel road from SD Highway 1804.
Thomas Bay RA	Approximately 15 miles southeast of Mobridge and 12 miles west of Selby. It is accessible by a 1-1/2-mile gravel road leading from SD Highway 1804. Because of the steep terrain and poor soils, the recreation area is nearly inaccessible when wet roadway conditions exist.
Indian Creek RA	Approximately 2 miles southeast of Mobridge and roughly 110 miles north of Oahe Dam. Extends from the Keszler Area to the west side of Revheim Bay. Access is off of U.S. Highway 12 via a 1-mile long paved road leading south into the recreation area.
Revheim Park RA	About 1 mile southeast of Mobridge. Accessible by a paved road which leads south from U.S. Highway 12. It is directly west of the Indian Creek Recreation Area and is separated from it by Revheim Bay.
Mobridge Waterfront Lake Access	Immediately west of the City of Mobridge. Extends roughly 1-1/2 miles along the lakeshore. Access to the southern end is by the Sale Barn Road leading from Mobridge between 7th and 8th Avenue. The northern end can be reached fomr the Drive-In Road leading from U.S. Highway 12.
Rifle Range Area	Northwest of Mobridge. Begins at the east end of the U.S. Highway 12 Bridge and extends west to the mouth of Water Plant Bay. Access to the area is by a paved section line road leading from U.S. Highway 12.
Little Leola Lake Access Area	Area includes the northern half of Hanson's Bay and is located approximately 11 miles south of Pollock, South Dakota. Access is by a gravel road leading from SD Highway 1804.
Shaw Creek RA	Approximately 7 miles south of Pollock, South Dakota. Access is by a 3-mile long gravel road leading west from SD Highway 1804.
West Pollock RA	Approximately 2 miles west of Pollock, South Dakota. Extends from the northeast side of Vanderlaan Bay into Pollock Bay to a point roughly 1 mile west of the city limits. On the south, the area access is by a paved road leading 2 miles west of SD Highway 1804. On the north, the area can be access by a 1-mile long gravel road leading west from Pollock.
Pollock RA	Includes lands on both sides of SD Highway 1804 as it crosses Pollock Bay. Access to the western portion (on Pollock Bay) is by city streets while the eastern portion (on Lake Pocasse) can be accessed directly from SD Highway 1804.
Foster Bay RA	South side of the Cheyenne River Arm of Lake Oahe approximately 45 miles northwest of Pierre. Access is by a 7-mile all-weather gravel road leading northeast from SD Highway 63.
Minneconjou RA	South shore of the Cheyenne River arm of Lake Oahe approximately 40 miles northwest of Pierre. Access to this Stanley County area is via SD Highway 1806, with the last 23 miles leading into the recreation area being gravel.
Chantier Creek RA	At the mouth of Chantier Creek, about 15 miles northwest of Oahe Dam. Access to the recreation area is via a 1-mile long steep all-weather gravel road leading east from SD Highway 1806.

APPENDIX B

AQUATIC NUISANCE SPECIES - FISH

Fish Species	***North Dakota Priority Class***	***Notes***
Black carp (*Mylopharyngdon piceus*)	Class 1	The black carp (*Mylopharyngodon piceus*) has been approved for release for stocking commercial aquaculture ponds to control snails and will surely escape into the wild just as the other three species of Asian carp, the silver, bighead, and the grass carp have. The bighead carp is a plankton feeder which may compete for food with paddlefish and bigmouth buffalo, as well as with forage fishes.
Silver carp (*Hypophthalmichthys molitrix*)	Class 1	The silver carp was released in the 1970s, 80s, and early 90s for aquaculture applications and has now developed large wild populations in the Missouri River basin. It competes for food with the larval stages of native game fish.
Bighead carp (*Hypophthalmichthyx nobilis*)	Class 1	The bighead carp was released in the 70s, 80s, and early 90s for aquaculture applications and has now developed large wild populations in the Missouri River basin. It competes for food with the larval stages of native game fish.
Tubenose goby (*Proterorhinus marmoratus*)	Class 1	This fish is native to eastern Europe and was introduced to the St. Clair River in Michigan in ballast water. It competes with bottom-dwellers but is smaller and less aggressive than the round goby.
Round goby (*Neogobius melanostomus*)	Class 1	This fish is a bottom-dwelling fish, native to eastern Europe that entered the eastern Great Lakes in ballast water. They can spawn several times per year, grow to about 10 inches, are aggressive, and compete with native bottom-dwellers including bullheads.
Rudd (*Scardinius erythrophthalmus*)	Class 1	Rudd are native to Asia and Europe. They are omnivorous fish and are fairly hardy. Their impacts on native fish are largely unknown but likely compete with native fishes for invertebrate food sources.
Ruffle (*Gymnocephalus cernuus*)	Class 1	The ruffe (*Gymnocephalus cernuus*) is a small perch-like Eurasian fish. It was apparently introduced to the Great Lakes in the St. Louis River near Duluth, Minnesota from a ballast water discharge. In Europe the ruffe feeds on whitefish eggs and competes with other more desirable fish.

Northern snakehead (*Channa argus*), blotched snakehead (*Channa maculate*), bullseye snakehead (*Channa marulius*), giant snakehead (*Channa micropletes*)	Class 1	The snakeheads are native to Asia, Maylasia, and Indonesia. The first snakehead in the continental United States was reported in 1968 in Rhode Island and snakeheads have since been spreading in the eastern United States. As top-level predators, snakeheads pose a major threat to native fish populations.
Grass carp (*Ctenopharyngodon idella*)	Class 2	The grass carp was released in the 70s, 80s, and early 90s for aquaculture applications and has now developed large wild populations in the Missouri River basin. It competes for food with the larval stages of native game fish.
Common carp (*Ciprio carpio*)	Class 3	The carp was introduced into Europe from the Caspian Sea region during the era of the Roman Empire and raised as a food fish. Carp are omnivorous, feeding on both plant materials and animal food items. Carp activity makes a lake an unsuitable environment for angler desirable fish. Waterfowl use decreases in waterbodies with a high carp population as there is no aquatic plants in those water bodies.

AQUATIC NUISANCE SPECIES – PLANTS

Plant Species	***North Dakota Priority Class***	***Notes***
Eurasian watermilfoil (Myriopyllum spicatum)	Class 2	Eurasian watermilfoil (EWM) was accidentally introduced to North America from Europe. A single segment of stem and leaves can take root and form a new colony. Fragments clinging to boats and trailers can spread the plant from lake to lake.
Saltcedar (*Tamaricaceae* spp.)	Class 2	Although this plant is not an aquatic, it has an impact on waterbodies due to its large water volume use during the summer. It outcompetes native plant communities, degrades wildlife habitat and has resulted in the decline of many species. Tamarisk reduces recreational and agricultural use, and increases wildfire frequency.
Curlyleaf pondweed (*Potamogeton crispus*)	Class 2	Curlyleaf pondweed is a perennial, rooted, submerged aquatic vascular plant native to Eurasia, Africa, and Australia. By 1950 most of the U. S. was infested by this species. By late spring it may form dense mats which interfere with recreation and limit the growth of native aquatic plants.
Purple loosestrife (*Lythrum salicaria*)	Class 4	Purple loosestrife is a wetland invader that was imported from Europe in the early 1800s for its medicinal value and for the beautiful purple spikes of the blooming plant. The plant is extremely difficult to eradicate although recently a suite of biological control agents, i.e., beetles and weevils, have proven effective in suppressing the plant.
Yellow flag iris (*Iris pseudacorus*)	Class 4	This invasive plant propagates by both seed and underground rhizomes. Poisonous if ingested, and irritating to the skin, yellow iris is fast growing, fast spreading, and very competitive. It forms almost impenetrable thickets. It was brought into the United States in the early 1900's as an ornamental and has been used for erosion control, as a dye and fiber plant, and in sewage treatment cells.
Flowering rush (*Butomus umbellatus*)	Class 4	Flowering rush was introduced through the North American shipping trade at the turn of the century in ballast as long-lived seed and possibly reproductive bulbets into the ecosystems of Quebec and Michigan. Use as an ornamental provided this invasive plant another route to the Midwest and expedited it's spread westward to the Idaho panhandle which would include North Dakota. Where flowering rush is found it is reported to be out-competing the native willows and cattails.

AQUATIC NUISANCE SPECIES - INVERTEBRATES

Crustacean Species	***North Dakota Priority Class***	***Notes***
Rusty crayfish (*Orconectes rusticus*)	Class 1	The rusty crayfish is an aggressive species of freshwater crayfish native to Indiana, Kentucky, Ohio, and Tennessee. Its range is rapidly expanding, displacing native crayfishes. They also impact ecosystems by removing large quantities of aquatic plants.
Echinogammarus ischnus	Class 1	This is an invasive amphipod (a small shrimp-like crustacean) native to Russia. It feeds on various macroinvertebrates and grazes on live plant tissue. It can displace native amphipods.
Spiny water flea (*Bythotrephes cederstroemi*)	Class 1	The spiny water flea is not actually an insect, but a tiny (less than half an inch long) crustacean with a long, sharp, barbed tail spine. This creature is native to Great Britain and northern Europe east to the Caspian Sea. The animals compete directly with young fish for food.
Fishhook water flea (*Cercopagis pengo*)	Class 1	The fishhook water flea is native to north-eastern Europe. The animals compete directly with young fish for food.

AQUATIC NUISANCE SPECIES - MOLLUSCS

Mollusc Species	***North Dakota Priority Class***	***Notes***
Zebra mussel (*Dreissena polymorpha*)	Class 1	Zebra mussels were introduced from Eastern Europe via ballast water discharge from European freighters. The zebra mussel is a prolific fouling organism with great potential to disrupt municipal water intake structures and cause ecological and economic damage in upper Midwest.
Asian clam (*Corbicula fluminea*)	Class 1	*Corbicula* are freshwater natives of southern and eastern Asia. The sources and pathway of initial introductions are not well documented. *Corbicula* will cause the same problems as zebra mussel.
New Zealand brown mud snail (*Potamopyrgus antipodarum*)	Class 1	Native to New Zealand but long established in Australia and Europe, this species was discovered in North America in 1987 in the Snake River in south-central Idaho. NZMS degrade habitat due to their high reproductive capacity and the subsequent impacts on invertebrate food sources. Fish receive little, if any, nutritive value from eating the snail.

AQUATIC NUISANCE SPECIES - PARASITES

Parasite or Pathogen Species	***North Dakota Priority Class***	***Notes***
Heterosporis	Class 1	Heterosporosis is a microscopic parasite, which has the potential to infect several fish species resulting in muscle lesions and can cause serious harm to fish. The parasite was first reported in yellow perch, but may also be found in walleye, northern pike, fathead minnows or other fish species.
Viral hemorrhagic septicemia (VHS) virus	Class 1	Viral hemorrhagic septicemia is a deadly fish disease caused by the viral hemorrhagic septicemia virus. Native to Russia, this virus was discovered in the United States in the late 1980s. It has caused massive die-offs in a variety of freshwater fish species in the Great Lakes.
Asian tapeworm (*Bothriocepahlus acheilognathi*)	Class 1	This parasite was introduced into the United States through shipments of infected grass carp from China. It has spread into several states with infected fish. The Asian tapeworm may infect many species of game, forage and bait fish.
Infectious Hematopoietic Necrosis (IHN) Virus	Class 1	IHN virus is an example of a pathogen, which is not currently known to occur in North Dakota, but which has the potential to cause serious mortality if it is introduced. It is a pathogen known to occur in fish in states west of North Dakota.
Whirling disease (Myxobolus cerebralis)	Class 3	Whirling disease is caused by a metazoan parasite that infects cartilage tissue of many Salmonid species. The whirling disease parasite was first introduced to the United States from Europe in the 1950s, probably through trout infected in Europe.

Source: NDGF 2005, NDGF 2008

APPENDIX C

ENVIRONMENTAL ASSESSMENT

UPDATE OF DESIGN MEMORANDUM MO-224
OAHE DAM/LAKE OAHE MASTER PLAN
Missouri River, South Dakota

July 2010

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FINDING OF NO SIGNIFICANT IMPACT

MISSOURI RIVER, SOUTH DAKOTA
OAHE DAM/LAKE OAHE MASTER PLAN UPDATE
CAMPBELL, CORSON, DEWEY, HAAKON, HUGHES, POTTER, STANLEY, SULLY, WALWORTH, AND ZIEBACH COUNTIES
SOUTH DAKOTA
BURLEIGH, EMMONS, MORTON, AND SIOUX COUNTIES
NORTH DAKOTA

3 June 2010

In accordance with the National Environmental Policy Act and implementing regulations, a programmatic Environmental Assessment (EA), incorporated by reference herein, has been prepared for the 2009 Oahe Dam/Lake Oahe Master Plan. The Master Plan update and EA became necessary when Public Law (P.L.) 105-53, Water Resources Development Act of 1999, amended by P.L. 106-541, Water Resources Development Act of 2000 (Title VI) transferred ownership of certain lands to the State of South Dakota and two Indian tribes. The updated Master Plan will provide guidance for stewardship of natural resources, and management for long-term public access to, and use of, the natural resources of Lake Oahe. The Master Plan provides a comprehensive description of the project, a discussion of factors influencing resource management and development, an identification and discussion of special problems, a synopsis of public involvement and input to the planning process, and descriptions of past, present, and proposed development. The Master Plan update only concerns areas still under the ownership of the U. S. Army Corps of Engineers (Corps) and will only reflect changes in land allocation and jurisdiction that occurred as a result of Title VI. It does not address or relate to any other Corps management policies that govern the Lake Oahe levels or flows from the dam.

Under the No Action alternative, the Master Plan would not be updated. The No Action alternative was eliminated from further consideration because the Master Plan is out of date due to significant changes in project use conditions, pertinent laws and policies, visitor use and public demand, among others. If the Master Plan was not updated, future major developments or resource management policies would require approval on a case-by-case basis without the benefit of evaluation in the context of an overall plan.

The EA and comments received from other agencies have been used to determine whether the proposed action requires the preparation of an Environmental Impact Statement (EIS). All environmental, social, and economic factors that are relevant to the proposal were considered in this assessment. These include, but are not necessarily limited to, prime farmland, water quality, air quality, noise, wetlands, wildlife, threatened and endangered species, and cultural resources. The primary benefit of the proposed project would be the update of the Master Plan to reflect important changes in project use conditions and land transfers as a result of the Title VI Land Transfer. No adverse impacts to threatened or endangered species or cultural resources are expected to occur as a result of projects proposed under the updated Master Plan. The proposed actions would be in compliance with applicable environmental statutes.

It is my finding, based on the environmental assessment, that the proposed Federal activity will not have any significant adverse impacts on the environment and that the proposed project will not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, an environmental impact statement will not be prepared.

Date: 5 OCT 10

Robert J. Ruch
Colonel, Corps of Engineers
District Commander

Table of Contents

1 THE PROPOSED PROJECT 1
1.1 Location 1
1.2 Purpose and Need for the Master Plan 1
2 ALTERNATIVES 2
2.1 Alternative 1: No Action 2
2.2 Alternative 2: Proposed Updated Master Plan 2
2.2.1 Scope of the Updated Master Plan 2
2.2.2 Objectives of the Proposed Action 3
2.2.3 Land Allocation, Land Classifications, and Resource Objectives 4
2.2.4 Proposed Development 9
3 AFFECTED ENVIRONMENT 10
3.1 Lake Operation 10
3.2 Hydrology 11
3.3 Ice Affected Flows 11
3.6 Accessibility 12
3.7 Climate 12
3.8 Topography, Geology, Soils 13
3.9 Vegetation Resources 13
3.10 Fish 14
3.11 Wildlife 14
3.11.1 Birds 14
3.11.2 Mammals 16
3.11.3 Reptiles and Amphibians 17
3.12 Aquatic Nuisance Species 17
3.13 Endangered, Threatened, and Rare Species and Communities 17
Table 2. Threatened and Endangered Species That Occur on Oahe Project Lands. 18
3.13.1 Federally Listed Species 18
3.13.1.1 Least Tern 18
3.13.1.2 Piping Plover 19
3.13.1.3 Whooping Crane 19
3.13.1.4 Black-Footed Ferret 19
3.13.1.5 Pallid Sturgeon 20
3.13.1.6 American Burying Beetle 20
3.13.1.7 Topeka Shiner 20
3.13.2 State Listed Species 20
3.13.2.1 Northern Redbelly Dace 20
3.13.2.2 Sturgeon Chub 21
3.13.2.3 Sicklefin Chub 21
3.13.2.4 Swift Fox 21
3.13.2.5 River Otter 21
3.13.2.6 False Map Turtle 21
3.14 Visual Qualities 22
3.15 Air Quality 22
3.16 Noise 23
3.17 Paleontology 23
3.18 Cultural Resources 23

3.19 Socioeconomic Characteristics....23
3.20 Visitation and Recreation Activities....24
4 CONSEQUENCES OF THE NO ACTION ALTERNATIVE....24
5 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION....24
6 POTENTIAL CUMULATIVE EFFECTS....31
7 REFERENCES....34
COMPLIANCE WITH ENVIRONMENTAL STATUTES....44

1 THE PROPOSED PROJECT

1.1 Location

Oahe Dam is located about six miles north of Pierre, South Dakota, on the Missouri River approximately 1072.3 river miles from its mouth. At normal operating pool level (1617 feet mean sea level (m.s.l.)), Lake Oahe extends roughly 231 miles from Oahe Dam to near Bismarck, North Dakota. At this level, the lake covers approximately 360,000 acres. At elevation 1607.5 m.s.l., base flood control elevation, the lake has over 2,250 miles of shoreline.

Lake Oahe is located in parts of ten counties in north-central South Dakota – Campbell, Corson, Dewey, Haakon, Hughes, Potter, Stanley, Sully, Walworth, and Ziebach, and in parts of four counties in south-central North Dakota – Burleigh, Emmons, Morton, and Sioux. U.S. Army Corps of Engineers (Corps) fee-owned lands surround the reservoir and contain such facilities as the dam embankment, powerhouse, maintenance facilities, recreation facilities, and wildlife habitat.

The Oahe Dam/Lake Oahe project was authorized under the Flood Control Act approved December 22, 1944 as amended, Public Law 78-534. The Oahe Dam and Lake Oahe were named for an Oahe Mission, established in 1874 to serve the Sioux Indians. The site of the mission was an old Arikara Indian Village, which the Sioux called "Ti Tanke Ohe" ("site of the large house") for the dirt council lodge located there. Shortened to "Oahe," the name of the village was eventually given to the mission and later to the dam and lake that now cover the area.

1.2 Purpose and Need for the Master Plan

The first Master Plan for Lake Oahe, Design Memorandum (DM) MO-150B, was approved in November 1962 for the purpose of providing flood control, irrigation, municipal and industrial water supply, navigation, hydropower, recreation, fish and wildlife, water quality, and other purposes. The purpose of updating the 1962 Master Plan is to provide guidance for stewardship of natural resources, and management for long-term public access to, and use of, the natural resources of Lake Oahe. The need for this update is based on significant changes in land ownership and management responsibilities, particularly the transfer of 75,340 acres of land to the Cheyenne River Sioux Tribe (CRST), the Lower Brule Sioux Tribe (LBST) and to the State of South Dakota in 2002 under Title VI (P.L. 105-53, WRDA 1999, as amended by P.L. 106-54, WRDA 2000). These changes also include management responsibilities, project use conditions, pertinent laws and policies, visitor use and public demand, among others. The Master Plan update provides a comprehensive description of the project, a discussion of factors influencing resource management and development, an identification and discussion of special

problems, a synopsis of public involvement and input to the planning process, and descriptions of past, present, and proposed development.

2 ALTERNATIVES

2.1 Alternative 1: No Action

Under this alternative, an updated plan would not be approved for the project in the foreseeable future and the previous 1962 Master Plan would continue to provide the only source of comprehensive management guidance and philosophy. Information provided in the aforementioned document is out of date because of significant changes in land ownership and management responsibilities, project use conditions, pertinent laws and policies, visitor use and public demand, among others.

Under the 1962 Master Plan, development and management of the project area will likely take the same general direction outlined in the proposed updated Master Plan. However, future major developments or resource management policies would require approval on a case-by-case basis without the benefit of evaluation in the context of an overall plan.

2.2 Alternative 2: Proposed Updated Master Plan

Under this alternative, an updated plan would be approved for the project to provide management guidance and philosophy and would replace the 1962 Master Plan. The aforementioned document will have significant updates due to the considerable changes in land ownership and management responsibilities, project use conditions, pertinent laws and policies, visitor use and public demand, among others.

2.2.1 Scope of the Updated Master Plan

This alternative would result from the approval of the proposed updated Master Plan. The Master Plan provides guidelines and direction for project development and use. It is based on responses to regional and local needs, resource capabilities and suitabilities, and expressed public interests consistent with authorized project purposes and pertinent legislation. The Master Plan provides a District-level policy consistent with national objectives and other State and regional goals and programs. This Master Plan includes guidance for the use and development of the natural and manmade resources at the Oahe Dam/Lake Oahe project. The plan includes: (1) a comprehensive description of the project; (2) a discussion of factors influencing resource management and development; (3) an identification and discussion of special problems; (4) a synopsis of public involvement and input; and (5) descriptions of past, present, and proposed development. The Master Plan is distinct from the project-level implementation emphasis of the Operational

Management Plan (OMP). Policies in the Master Plan are guidelines implemented through provisions of the OMP, specific Design Memorandums, and the Annual Management Plans. The broad intent of the Oahe Master Plan is to document policies and analyses that do the following:

1. Determine appropriate uses and levels of development of project resources;

2. Provide guidelines within which the OMP and Annual Management Plans can be developed and implemented; and

3. Establish a basis on which outgrants and recreational development proposals can be evaluated.

The updated Master Plan is intended to direct the use and development of the Oahe project resources into the 21st century. Supplements will be prepared as appropriate and justified.

2.2.2 Objectives of the Proposed Action

Resource objectives are realistically attainable goals for the use, development, and management of natural and manmade resources. They are guidelines for obtaining maximum public benefits while minimizing adverse impacts and protecting and enhancing environmental quality. They are developed with full consideration of authorized project purposes, applicable Federal laws and directives, resource capabilities, regional needs, plans and goals of regional and local governmental units, and expressed public desires. The project-wide resource objectives for Lake Oahe, not in priority order, are as follows:

- To develop and manage lands and waters in full cooperation and coordination with other public management agencies and appropriate private sectors;

- To develop and manage the Oahe project lands and waters to support various types and levels of recreation activities consistent with carrying capacities and aesthetics, cultural, and ecological values;

- To provide public education about the history of the area, Oahe project resources, and the Corps' role in developing and managing these resources;

- To develop and manage the project lands and waters to support a diversity of fish and wildlife species;

- To preserve and protect threatened and endangered species and unique and important ecological and aesthetic resources;

- To maintain and manage project lands and waters to support regional management programs, such as regional conservation programs for the least tern, piping plover,

and pallid sturgeon in support of the Biological Opinion on the Missouri River;

- To protect and interpret significant cultural resource sites;
- To maintain a high quality water supply for irrigation, water supply, recreation, fish and wildlife use; and
- To manage resources in response to sedimentation trends.

2.2.3 Land Allocation, Land Classifications, and Resource Objectives

All Oahe project lands have an allocation of Operations because they were acquired to provide safe, efficient operation of the project for its authorized purposes. These project purposes include flood control, hydropower, navigation, irrigation, municipal and industrial water supply, fish and wildlife conservation, water quality and recreation. Separable lands were not acquired for purposes of recreation, fish and wildlife conservation, or mitigation. The information used in determining the land acquisition consisted of the estimated water elevations for each reach of the reservoir from the dam to 10.5 miles downstream from Bismarck, North Dakota. The proposed guide acquisition lines were ultimately based on (1) a maximum operating pool elevation of 1620 feet m.s.l. and (2) any area affected by backwater aggradation, bank caving, or erosion as a result of wind effects and wave actions as determining for the pool level at elevation 1617 feet m.s.l..

This section also reflects lands transferred in fee title under Title VI (P.L. 105-53, WRDA 1999, as amended by P.L. 106-54, WRDA 2000) to the Department of the Interior, to be held in trust for the Cheyenne River Sioux Tribe (CRST), the Lower Brule Sioux Tribe (LBST) and to the State of South Dakota in 2002. Under the Title VI land transfer the Corps was required to 1) transfer in fee title certain lands (outside the boundaries of the reservations) above elevation 1620 feet m.s.l.to the CRST and above elevation 1423 to the LBST, the top of the exclusive flood control pool to the State of South Dakota to be managed by the South Dakota Game, Fish, and Parks Department (SDGFP); 2) transfer in fee title lands within the exterior boundaries of the reservations of the CRST and LBST that are above elevation 1620 feet m.s.l. to the Department of Interior (DOI) to be managed in trust for the two tribes; 3) transfer all remaining Corps recreation areas in South Dakota above elevation 1607.5 feet m.s.l. to SDGFP; and 4) establish the South Dakota Terrestrial Wildlife Habitat Restoration Trust Fund, Cheyenne River Sioux Tribe Terrestrial Wildlife Habitat Restoration Trust Fund, and Lower Brule Sioux Tribe Terrestrial Wildlife Habitat Restoration Trust Fund to pay for wildlife restoration work, cultural resources preservation, and management of transferred lands. Under the provisions of Title VI, the Corps retains fee title to lands and structures necessary for the operation of the Oahe dam and related flood control and hydropower structures, including land below elevation 1620 m.s.l.. On January 26, 2002, the Corps transferred in fee title approximately 3,066 acres, including 27 recreation areas outside the boundaries of Indian reservations above elevation 1607.5 feet m.s.l. to the State of South Dakota. Lands above elevation 1620 feet m.s.l., totaling

approximately 39,394 acres, were transferred in fee title to the State of South Dakota in July 2007. On June 5, 2002 the Department of Interior, Bureau of Indian Affairs accepted the transfer of custody and accountability of approximately 32,880 acres, including 6 recreation areas within the boundaries of CRST to be held in trust for the CRST. This transfer total, to date, equals approximately 75,340 acres under Title VI.

Prior to the land transfers, the Oahe project encompassed approximately 429,767 acres. To date the total transferred (disposed of acres in table 1) acres to North and South Dakota equal approximately 77,089 acres. Transfer of land to North Dakota equals approximately 622 acres and includes, fee lands and easement lands only. Transfer of land to South Dakota equals approximately 76,467 and includes 75,340 acres under Title VI and 1,127 acres that include other fee lands, easement lands and public domain lands. Public domain lands are lands owned by the Bureau of Indian Affairs and the Bureau of Land Management. Total Corps owned acres lands remaining equal 352,677 acres of which 99,875 acres are operations allocation lands (described below). The remaining 252,802 acres are lands that are inundated by water after completion of the dam, but still owned by the Corps. Table 1 reflects the approximate acreages transferred to the states and lands that are currently owned by the Corps at the project. Table 1 also includes acre totals within the land operation allocation classification (discussed below).

Within the Operations allocation, land is divided into land classifications. All lands acquired for project purposes are classified in a manner that provides for development and resource management consistent with authorized project purposes and other Federal laws. The classification process refines the land allocations to fully use project lands and considers public desires, legislative authority, regional and project-specific resource requirements, and suitability.

The updated Master Plan provides guidance on public use, water quality, natural areas, and historic properties within Corps' boundaries. It describes land classifications and management practices similar to those already in effect while also describing new allocations and resource objectives of both current and new allocations. These are further described in the paragraphs below. A complete list of existing land use areas/units and associated resource objectives are included in the Master Plan update.

Project Operations Lands. This classification includes lands required for the dam and associated structures, operations center, administrative offices, maintenance compounds, and other areas that are used to operate and maintain the Oahe Dam/Lake Oahe project. Where compatible with operational requirements, Project Operations lands may be used for wildlife habitat management, recreational use, or agricultural activities. Licenses, permits, easements, or other outgrants are issued only for those uses that do not conflict with operational requirements. Approximately 6,500 acres of land are classified as Project Operations.

Recreation Lands. These lands are designated for intensive levels of recreational use to accommodate and support the recreational needs and desires of project visitors. They include lands on which existing or planned major recreational facilities are located and allow for developed public recreation facilities, concession development, and high-density or high-impact recreational use. Approximately 2,200 acres of land at the Oahe project are classified as Recreation.

Mitigation Lands. This classification includes those lands specifically designated to offset habitat losses associated with the development of the Oahe project. No lands are currently classified as mitigation lands at the Oahe project.

Table 1. Government-Owned Lands at the Oahe Project

State	County	Acquired Acres1	Disposed Acres2	Current Acres
North Dakota	Burleigh	11,078	434	10,643
North Dakota	Emmons	32,638	0	32,638
North Dakota	Morton	14,016	149	13,867
North Dakota	Sioux	26,350	38	26,310
South Dakota	Bon Homme	0	0	0
South Dakota	Campbell	23,311	4,575	18,736
South Dakota	Corson	42,357	433	41,923
South Dakota	Dewey	110,921	31,845	79,076
South Dakota	Haakon	4,012	920	3,092
South Dakota	Huges	17,141	1,880	15,261
South Dakota	Potter	18,849	4,050	14,799
South Dakota	Stanely	58,354	15,606	42,749
South Dakota	Sully	44,653	11,478	33,175
South Dakota	Walworth	21,229	4,574	16,655
South Dakota	Ziebach	4,859	1,106	3,753
Totals		429,767	77,090	352,677

1. Acquired land includes fee land, easement, public domain, Tribal, and lands acquired for temporary use.
2. Disposed land includes fee land, easement, public domain, Tribal, and lands transferred under Title VI.

Operations Allocation Classifications Below 1620 m.s.l.	Acres
Project Operations Lands	6,500
Recreation Lands	2,150
Mitigation Lands	0
Environmentally Sensitive Areas	1,750
Multiple Resource Management Lands	
Recreation-Low Density	1,840
Wildlife Management	85,400
Vegetative Management	0
Inactive and/or Future Recreation Areas	370
Easement Lands	1,895
Total Land Operation Allocation	99,905

The remaining 252,772 acres (Current Acre Total (above table) minus Total Land Operation Allocation) not accounted for in this table are inundated.

Environmentally Sensitive Areas. This classification consists of areas where scientific, ecological, cultural, or aesthetic features have been identified. Development of public use on lands within this classification is normally limited or prohibited to ensure that the sensitive areas are not adversely impacted. Agricultural or grazing uses are not permitted on lands with this classification. Approximately 1,750 acres of Oahe project land are classified as Environmentally Sensitive.

Multiple Resource Management Lands. This classification, which contains approximately 87,000 acres, includes lands managed for one or more of the following activities:

- Recreation-Low Density. These lands are designated for dispersed and/or low-impact recreation use. Approximately 1,840 acres of Oahe project lands are included in this sub-classification. Development of facilities on these lands is limited. Emphasis is on providing opportunities for non-motorized activities such as walking, fishing, hunting, or nature study. Site-specific, low-impact activities such as primitive camping and picnicking may be allowed. Some limited facilities are permitted, including boat ramps, trails, parking areas and vehicle controls, vault toilets, picnic tables, and fire rings.

- Wildlife Management. These lands are designated for wildlife management, although all project lands are managed for fish and wildlife habitat in conjunction with other land uses. Wildlife management lands contain valuable wildlife habitat components that are maintained to yield habitat suitable for a designated wildlife species or group of species. Approximately 85,400 acres of Oahe project lands are included in this sub-classification. These lands may be administered by other public agencies under a lease, license, permit, or other formal agreement. Licenses, permits, and easements are not allowed for such manmade intrusions as pumping plants, pipelines, cables, transmission lines, or non-project roads. Exceptions to this policy are allowable where necessary for the public interest. Wildlife lands are available for sightseeing, wildlife viewing, nature study, and hiking. Consumptive uses of wildlife, including hunting, fishing, and trapping, are allowed when compatible with the wildlife objectives for a given area and with Federal and State fish and wildlife management regulations.

- Vegetative Management. Management activities in these areas focus on the protection and development of forest resources and vegetative cover. The Oahe Dam/Lake Oahe project has no project lands with this sub-classification, but all project lands are managed to protect and develop vegetative cover in conjunction with other land uses.

- Inactive and/or Future Recreation Areas. This sub-classification consists of lands for which recreation areas are planned for the future or lands that contain existing

recreation areas that have been temporarily closed. The Oahe Dam/Lake Oahe project has approximately 370 acres with this sub-classification. Although development of these areas will not be done by the Corps, they are suitable for development by State or Tribal entities.

- Easement Lands. This classification consists of lands for which the Corps did not acquire fee title but did acquire (1) the right to enter onto the property in connection with the operation of the Oahe project and (2) the right to occasionally flood the property. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement acquired for the project. There are roughly 1,895 acres under easement.

2.2.4 Proposed Development

The updated Master Plan proposes several actions for the combined purposes of improving recreation and protecting and enhancing the natural resources found in the project area. The following is a summary of the general types and purposes of the proposed actions.

Constructing Facilities. Development proposed for the Oahe project includes roads, camping and picnicking facilities, marina facilities, a designated swim beach, hiking trails, interpretive signage, playground equipment, fish cleaning tables, security lighting, toilets, potable water, and a dump station. In general, construction is focused into recreation areas or is designed to concentrate human access onto identified roads and pathways to prevent random access. At sites where many measures are proposed, the updated plan recommends that a site plan be prepared prior to expansion of recreation facilities.

Development of Least Tern and Piping Plover Habitat. Between 1986 and 2000, nearly 44 percent of piping plovers and 27 percent of least terns were recorded on reservoir habitats during the adult census (USFWS 2003). Productivity surveys have shown reservoir habitat can significantly contribute to plover and tern recruitment, particularly during drought or low runoff years when reservoir elevations are lower and habitat is more abundant. In 2009, 37 piping plover chicks fledged from Lake Oahe (fledge ratio .49 chicks per pair) and 34 Interior least tern chicks fledged from Lake Oahe (fledge ratio 1.08 chicks per pair). Through efforts of the Corps and with more intensive monitoring, data has shown that reservoir habitats provide a vital resource for the birds, especially during periods of substantial pool fluctuations. The 2003 Amended Biological Opinion called for evaluating the potential for creating habitat within the reservoir to supplement natural habitat required through: (1) replenishment or nourishment of river sandbars and islands; (2) creation of suitable nesting habitat in reservoir depositional zones; (3) creation or enhancement of shallow and backwater areas, off-channel chutes, and flats as foraging habitat; (4) removal of early successional vegetation from nesting areas; (5) peninsular cutoffs or island creations in reservoir side bays; and (6) dike construction to dewater reservoir side bays for nesting and foraging habitat (USFWS 2003). The Missouri River

Recovery Program will be evaluating and potentially implementing tern and plover habitat projects within the reservoir.

Water Quality Management. As stewards of a significant percentage of the nation's aquatic environment, the Corps has a responsibility to preserve, protect, and where necessary, restore water quality altered by Corps projects. A continuing water quality-monitoring program is part of the Corps efforts to understand and effectively manage aquatic resources at its projects. The Corps water quality management program is detailed in the Corps' primary water quality regulation - Engineer Regulation (ER) 1110-2-8154, "Water Quality and Environmental Management for Corps Civil Works Projects."

Planting Trees and Shrubs. Trees and shrubs would be planted to increase winter cover, woody vegetation, food sources for wildlife, and dense nesting cover for upland game. Vegetation buffers would be created to separate overnight camping from day use areas. Plantings in campgrounds and day use areas will provide shade and shelter for people and wildlife.

Establishing Food Plots. Food plots would be established to supplement native food sources for waterfowl, migrant bird species, big game, and upland game species. Existing food plots typically consist of a monotypic stand of row crops, such as oats, wheat, tall cane, or sunflowers. Food plots are planted on previously farmed lands acquired by the Corps.

Controlling Erosion. Bank stabilization techniques utilizing appropriate measures would be implemented along the lake shoreline for erosion control to protect recreation areas, reservoir facilities, and Cultural and Historic resources. These stabilization techniques can include rip-rap stabilization, planting shoreline vegetation, including flood-tolerant species such as cottonwoods, willows, green ash, red osier dogwood, elderberry, and false indigo, and anchoring logs and snags.

Other Actions. Several other actions are proposed, including improvement of wildlife habitat by prescribed burning, planting native grasses, and controlling grazing and agricultural use; planting marsh grasses for fish habitat and food supply; and other site-specific improvements.

3 AFFECTED ENVIRONMENT

3.1 Lake Operation

Lake Oahe provides a significant storage contribution to the mainstem reservoir system. The lake is the second largest of the six reservoirs, with a storage capacity of 23.1 million acre-feet. Lake Oahe, along with the remaining mainstem lakes, is regulated on a repetitive annual cycle. Several activities are directly impacted by fluctuations in lake surface area. Fluctuations in lake elevation have a harmful effect on the concessions along Lake Oahe

and render some boat ramps unusable. In addition, although the warmer waters near the surface of Lake Oahe help in the development of a warm-water fishery, the amount of fish spawning habitat decreases as the lake level is drawn down.

3.2 Hydrology

The drainage pattern of the Oahe Dam/Lake Oahe project is similar to the other Missouri River main stem projects. West of the Missouri River, the drainage pattern is generally well defined. However, to the east of the river, there are numerous depressions and portions of the region that do not contribute directly to stream flow unless substantial amounts of runoff occur.

The area of the upper Missouri River controlled by the Fort Peck and Garrison Dams controls three-fourths of the total drainage area contributing to Lake Oahe. This includes essentially all of the mountainous area contributing to the Missouri River upstream from Oahe Dam. The total drainage area consists of 243,490 square miles. Of this, Lake Oahe has a drainage area of 62,250 square miles.

3.3 Ice Affected Flows

The combination of aggradation and ice-affected flow conditions has the potential to increase flooding along the shoreline of Pierre and Fort Pierre during the wintertime. The occasional peaking operations at the Oahe power plant cause rapid changes in river stages in the Pierre and Fort Pierre areas that can result in lowland flooding.

3.5 Surface Water Quality

The Corps conducted intensive water quality surveys at Lake Oahe in 2005, 2006, and 2007. Seven in-lake deepwater sites and two inflow sites are monitored as part of the intensive water quality surveys. The seven in-lake sites are located along the old Missouri River channel from near Oahe Dam to the Mobridge area, and are approximately equally spaced along the 125-mile distance. Monitoring includes monthly sampling from June through September that includes depth-profile measurements and collection of depth-discrete samples for laboratory analysis. Monthly inflow samples from May through September were collected from the Missouri River near Bismarck, North Dakota and the Cheyenne River near Eagle Butte, South Dakota.

Corps and sponsor-designated swimming beaches are sampled by State personnel for bacteria in accordance with State regulations. Any exceedances of State standards require the closing of beaches and retesting until the results fall within the regulations.

No significant water quality concerns were detected at the near-dam deepwater ambient monitoring site during the four-year period of 2002 through 2005. The only water quality

standards criteria exceeded at the near-dam site were water temperature and dissolved oxygen for the protection of coldwater permanent fish life propagation.

Under Section 303(d) of the Federal Clean Water Act, States and Tribes, with the delegated authority from the U.S. Environmental Protection Agency, are required to regularly prepare a listing of impaired waters [i.e., 303(d) list]. Impaired waters refer to those water bodies where it has been determined that technology-based effluent limitations required by Section 301 of the Federal Clean Water Act are not stringent enough to attain and maintain applicable water quality standards. States and Tribes, as appropriate, are required to establish and implement Total Maximum Daily Loads (TMDLs) for water bodies on their 303(d) lists. As of January 2008, the States of North and South Dakota had not placed Lake Oahe on the state's Section 303(d) list of impaired waters (USACE 2008).

3.6 Accessibility

Lake Oahe is located in south-central North Dakota and north-central South Dakota between Bismarck, North Dakota, and Pierre, South Dakota. Oahe Dam is located six miles north of Pierre, 115 miles south of Mobridge, South Dakota, and 215 miles south of Bismarck. In South Dakota, the major access point is Interstate 90. It is the only east/west interstate and is located 38 miles south of Oahe Dam and 158 miles south of Mobridge. In North Dakota, the main access point is Interstate 94 at Bismarck, the only east/west crossing of Lake Oahe in North Dakota.

The east side of Lake Oahe can be reached from either U.S. Highway 83 or State Highway 1804; both highways run between Bismarck and Pierre. Access to the west side of Lake Oahe varies by location - from Mandan to Fort Yates, North Dakota, on ND Highway 1806; from Fort Yates to McLaughlin on ND Highway 24; from McLaughlin to Mobridge on U.S. Highway 12; and from Mobridge to Fort Pierre/Pierre on SD Highways 20, 63, and U.S. Highway 14. These roads are good all-weather highways. The only east/west highways which provide access to both sides of Lake Oahe are U.S. Highway 12 at Mobridge, South Dakota and U.S. Highway 212 near Gettysburg, South Dakota. Access to project lands other than designated recreation areas can be difficult in some locations because of the lack of good secondary roads.

3.7 Climate

Lake Oahe lies within North Dakota and South Dakota in the Great Plains region of the United States and Canada. The Great Plains' continental interior climate is characterized by hot summers and cold, dry winters. Prolonged droughts of several years' duration and frequent shorter periods of deficient moisture, interspersed with periods of abundant precipitation, are characteristic of the Plains area.

3.8 Topography, Geology, Soils

The States of North Dakota and South Dakota are part of two physiographic provinces, the Central Lowlands and the Great Plains, each of which occupies nearly half of these two States. Lake Oahe project lands are located within the northern Great Plains province. The Great Plains Province can be subdivided into the Coteau du Missouri (the glaciated) region and the Pierre Hills (the un-glaciated) region. The Missouri River is the approximate separating line for these two areas.

Forty-four different soil associations are found at the Oahe project. Several general soil patterns are found in the vicinity of the Lake Oahe project area. The soils in upland areas, including sand-mantled uplands and upland swales, are nearly level to very steep, clayey, silty, and sandy soils underlain by bedrock. These soils are shallow to deep, well drained and somewhat excessively drained, medium textured, and moderately to strongly sloping soils.

The bottomland areas are nearly level, moderately well drained and somewhat excessively drained, fine to coarse textured soils. The soils on outwash plains generally are nearly level to rolling, well drained, and mostly moderately coarse textured. Dissected plains and plains areas generally are nearly level to steep, well drained, silty, loamy claypan, and loamy soils. Soils found within the Lake Oahe project area vary in their suitability or limitations for particular uses. Potential problems posed by soils for a particular kind of development must be identified during the early planning stages so recreation areas, roads, structures, and other features can be properly sited.

Another problem posed is the effects of sedimentation and shoreline erosion. These are considered when planning resource use and recreational development. For example, the consequences of future aggradation trends on proposed facilities are determined prior to their construction and the effects of littoral drift and sedimentation are considered when designing boat ramps. The major sedimentation processes affecting Lake Oahe are transport and deposition of watershed sediments into the reservoir, littoral drift, and erosion of shoreline banks. Major sediment deposition occurs at the mouth of the tributary streams as they enter Lake Oahe. Littoral drift causes the formation of bars or shoals across bays. The rate and extent of shoreline erosion is determined by the nature of the shore materials, the energy of the oncoming waves, and the tendency of the eroded material to form beaches.

3.9 Vegetation Resources

The native vegetation that is found on the Lake Oahe project varies widely. The different types of vegetative cover that occur around Lake Oahe project lands may be classified in the following types: (1) wetlands, (2) bottomland hardwoods, (3) shorelines, (4) woody draws, (5) grasslands, and (6) agricultural lands.

The project is located within the Great Plains dry steppe, or shortgrass prairie, ecoregion which is characterized by buffalograss (*Bouteloua dactyloides*), grama (*Bouteloua* spp.), wheatgrass (*Agropyron* spp.), needlegrass (*Stipa* spp.), and wildflowers such as blazingstar (*Liatris* spp.) and white prickly poppy (*Argemone albiflora*) (Bailey 1995). However, the east bank of Lake Oahe has a good number of tallgrass species in some areas, including little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), and big bluestem (*Andropogon gerardii*) on the better-managed tracts. On the steep clay shale soils, prickly pear cactus (*Opuntia* spp.), yucca (*Yucca* spp.), and sage (*Artemisia* spp.) are the predominate species. Shrubs, woody plants, and trees are scarce on the lake, comprising less than 5% of the total land area. Persistent heavy grazing by domestic livestock over the years has had dramatic impacts on all plant species along the lake.

3.10 Fish

Prior to the impoundment of Lake Oahe, the Missouri River fisheries community consisted basically of warmwater fish. After impoundment the northern pike (*Esox lucius*) and panfish populations increased tremendously as the reservoir filled. As the reservoir matured, walleye (*Sander vitreus*), a coolwater species, emerged as the dominant species. After Lake Oahe filled, a deep cold water habitat was created, allowing a cold water fishery to be developed. The SDGFP initiated a stocking program to fill the vast cold waters of Lake Oahe. Some of the more common species stocked in Lake Oahe to fill this niche were Chinook salmon, rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), lake trout (*Salvelinus namaycush*), lake whitefish (*Coregonus clupeaformis*), lake herring (*Coregonus artedii*), and kokanee salmon (*Oncorhynchus nerka*). Rainbow smelt, stocked by North Dakota, became the prime food base for the cold-water fishery that presently exists in the lake. Smallmouth bass (*Micropterus dolomieu*) and spottail shiners (*Notropis hudsonius*) are two of the more successful warm water fish species that have been stocked. Throughout most of the 1980s and 1990s the SDGFP annually stocked walleye fry and fingerlings, Chinook salmon, and rainbow trout. Currently all trout stockings have ceased as have supplemental stockings of walleye. The only fish being stocked in Lake Oahe at present is the Chinook salmon. The NDGF does not typically stock the North Dakota portion of Lake Oahe, but has stocked some fish, particulary Northern pike, in the past.

3.11 Wildlife

3.11.1 Birds

Lake Oahe lies within the central flyway and is a corridor for massive spring and fall migrations of waterfowl. Sandhill cranes (*Grus americana*), Canada geese (*Branta canadensis*), white-fronted geese (*Anser albifrons*), snow geese (*Chen caerulescens*), and mallard ducks (*Anas platyrhynchos*) are the most common migrating species. American bitterns (*Botaurus lentiginosis*), cormorants (*Phalacrocorax olivaceus*), white pelicans (*Pelecanus erythrorhynchos*), and great blue herons (*Ardea herodias*) are other large

waterbirds that also frequent Lake Oahe.

Many other birds use the project for multiple purposes such as mating, nesting, migrating, loafing, and foraging for food. Oahe's woody draws and remnant riverine forest stands are the most valuable habitats. Although these habitats make up less than 3 percent of the land mass, they are used by a high proportion of birds throughout the year. Birds that are year-round residents find these habitats especially valuable for shelter in the winter. Researchers from the U.S. Forest Service Rocky Mountain Forest and Range Experiment Station studied the bird community along the Missouri River in central South Dakota from 1990-1992 (Rumble and Gobeille 2004). They found that older cottonwood woodlands are especially valuable to birds. Total bird abundance, species diversity, species richness, richness of woodland obligates (species that are almost always found in woodlands), abundance of tree-nesting species, abundance of cavity-nesting species, and abundance of shrub-nesting species were greater in late and late intermediate cottonwood stands.

In addition, the adjoining croplands and grasslands are used by species such as a variety of sparrows (*Spizella* spp.), American robins (*Turdus migratorius*), brown thrashers (*Toxostoma rufum*), flycatchers (*Empidonax* spp.), rose-breasted grosbeaks (*Pheucticus ludovicianus*), warblers (*Dendroica* and *Geothlypis* spp.), indigo buntings (*Passerina cyanea*), and meadowlarks (*Sturnella* spp.). Native prairies along Lake Oahe are home to several ground-nesting species of birds. The more common birds in this group are bobolinks (*Dolichonyx oryzivorus*), western meadowlarks (*Sturnella neglecta*), upland sandpipers (*Bartramia longicauda*), lark buntings (*Calamospiza melanocorys*), long-billed curlews (*Numenius americanus*), McCown's longspurs (*Calcarius mccownii*), and burrowing owls (*Athene cunicularia*).

Birds of prey are also year-round residents and migrants on the project. Larger birds include turkey vultures (*Cathartes aura*), golden eagles (*Aquila chrysaetos*), bald eagles (*Haliaeetus leucocephalus*), great horned owls (*Bubo virginianus*), and various hawks (*Buteo* and *Accipiter* spp.). Smaller birds of prey also found on the project lands include the osprey (*Pandion haliaetus*), prairie falcon (*Falco mexicanus*), nighthawk (*Chordeiles minor*), and short-eared owl (*Asio flammeus*). Upland game birds were significantly impacted by the loss of woody habitat when Lake Oahe was impounded. Populations of wild turkeys (*Meleagris gallopavo*), sharp-tailed grouse (*Tympanuchus phasianellus*), prairie chickens (*Tympanuchus cupido*), ring-necked pheasants (*Phasianus colchicus*), Gray partridges (*Perdix perdix*), and mourning doves (*Zenaida macroura*) have declined since the reservoir was created. Wild turkeys are found in the downstream area; the Moreau, Grand, Cheyenne, and Cannonball River drainages; McClean Bottoms; Kimball Bottoms; Beaver Creek; and Badger Bay. Pheasants, grouse, and partridge are found in areas on both sides of the lake that have suitable habitat. The sharp-tailed grouse species is found most often on the rangeland portions of the project with higher populations occurring on the west bank in South Dakota and both the east and west banks in North Dakota. Pheasants are found adjacent to agricultural cropland and are found more often on the east bank than the west.

3.11.2 Mammals

The mammals found in the Lake Oahe region include big game and small game species, various furbearers, and numerous rodents. Big game species on Lake Oahe project lands are limited to mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), and wild turkey. South Dakota considers turkey big game, while in North Dakota it is considered an upland species. Deer populations on the Oahe project have gradually risen because of county deer management and the replacement of pastureland with irrigated cropland. In successive years of lower water, the habitat created on the exposed shorelines, mud flats, and peninsulas is especially beneficial to the deer herds. Although pronghorn existed on project lands prior to inundation, they did not use the old Missouri River trench. Today, the limited pronghorns that are found on project lands are only incidental visitors. Oahe project land occupies only a small portion of the pronghorn's grassland habitat. Furbearers and large predators found on Lake Oahe include coyotes (*Canis latrans*), bobcats (*Lynx rufus*), red foxes (*Vulpes vulpes*), badgers (*Taxidea taxus*), skunks (*Mephitis mephitis*), raccoons (*Procyon lotor*), beavers (*Castor canadnesis*), mink (*Mustela vison*), muskrats (*Ondatra zibethicus*), and weasels (*Mustela nivalis*). Small game mammals include eastern cottontails (*Sylvilagus floridanus*), white-tailed jackrabbits (*Lepus townsendii*), and fox squirrels (*Sciurus niger*).

A small number of porcupines (*Erethizon dorsatum*) live in the bottomland hardwoods along the tributaries to the lake. Other common rodents include the Richardson's ground squirrel (*Spermophilus richardsonii*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), pocket gopher (*Thomomys* spp.), prairie vole (*Microtus ochrogaster*), deer mouse (*Peromyscus maniculatus*), and western harvest mouse (*Reithrodontomys megalotis*).

The black-tailed prairie dog is found throughout much of western South Dakota. Although the population is considered to be generally stable in the state, there has been concern about declines in other parts of its range. In 1998 the National Wildlife Federation filed a petition asking the U.S. Fish and Wildlife Service to list the black-tailed prairie dog as a federal threatened species. The U.S. Fish and Wildlife Service determined that this species was warranted for such a listing, but listing was precluded by higher listing priorities. South Dakota is one of eleven states that has worked cooperatively to develop management programs to help avoid the need to list the blacktailed prairie dog as a federal threatened species (SDGFP 2007b). In August 2004, the blacktailed prairie dog was removed from federal candidate list, due to results of surveys that better described the extent of the species' range and commitments by state, tribal, federal, and private entities to continue to work cooperatively on this issue (SDGFP 2007b).

Prairie dog shooting is prohibited on public lands in South Dakota from March 1 through June 14. Shooting is permitted year-round on private lands (SDGFP 2007b). The exception is the Conata Basin in Buffalo Gap National Grassland, which is closed to prairie

dog shooting year-round (SDGFP 2007b). The state shooting closure does not apply to private or tribal lands in South Dakota (SDGFP 2007b).

3.11.3 Reptiles and Amphibians

Reptiles and amphibians on Lake Oahe are somewhat limited in terms of diversity. The dominant amphibians are leopard (*Rana pipiens*) and chorus frogs (*Pseudacris triseriata*); woodhouse's toad (*Bufo woodhousei*), plains spadefoot (*Spea bombifrons*), and Great Plains toads (*Bufo cognatus*); and tiger salamanders (*Ambystoma* spp.). Common reptiles include the snapping turtle (*Chelydra serpentina*), western painted turtle (*Chrysemys picta belli*), bull snake (*Pituophis catenifer sayi*), prairie rattlesnake (*Crotalus viridis*), red-sided garter snake (*Thamnophis sirtalis*), and plains garter snake (*Thamnophis radix*). The midland smooth softshell (*Apalone mutica mutica*), false map turtle (*Graptemys pseudogeographica*), western hog-nosed snake (*Heterodon nasicus*), and eastern yellow-bellied racer (*Coluber constrictor*) are less commonly seen species.

3.12 Aquatic Nuisance Species

Aquatic nuisance species (ANS) is a legal definition for aquatic plants, animals and pathogens that when introduced into new ecosystems have harmful impacts in the way the ecosystem functions. ANS ultimately reduce the recreational and functional value of aquatic resources.

To date, North Dakota has a limited number of ANS in a few isolated locations (NDGF 2005). ANS can arrive in the Oahe area with recreational boats or other equipment that arrives from ANS infested areas. Commercial importation of undesirable species to support the pet trade, water gardens, and landscaping means it is easier for a noxious species to enter commercial markets and become widely distributed. The state of North Dakota has created a management plan for aquatic nuisance species (NDGF 2008).

The state of South Dakota formed a cooperative program to oversee the drafting of an ANS Management Plan for South Dakota. This draft, which was completed in December of 2008, has set goals for the State of South Dakota which are (1) To prevent new introductions of ANS to South Dakota. (2) To educate all aquatic users of ANS risks and how to reduce the harmful impacts. (3) To prevent dispersal of established populations of ANS into uninfested waters in South Dakota. (4) To eradicate or control ANS to minimize the adverse ecological, economic, social, and public health effects of ANS in an environmentally sound manner. (5) To support research on ANS in South Dakota, and develop systems to disseminate information.

3.13 Endangered, Threatened, and Rare Species and Communities

Federal and South Dakota State listed species that are known to occur at the Lake Oahe Project or may occur at the Project (Doug Backlund, South Dakota Natural Heritage

Program, pers. comm., 2005) are listed in Table 2. The State of North Dakota does not maintain a list of rare or endangered species independent of the Federal listings. A number of species of concern are also monitored by the South Dakota Natural Heritage Program (SDNHP), although these species do not have an official Federal or State listing status. Species noted in this section may also occur in North Dakota counties or as noted in the following paragraphs.

Table 2. Threatened and Endangered Species That Occur on Oahe Project Lands.

Common Name	**Scientific Name**	**Federal Listing Status[1]**	**State Listing Status[2]**
Least Tern	*Sternula antillarum*	E	E
Piping Plover	*Charadrius melodus*	T	T
Whooping Crane	*Grus americana*	E	E
Black-footed Ferret*	*Mustela nigripes*	E	E
Pallid Sturgeon	*Scaphirhynchus albus*	E	E
American Burying Beetle*	*Nicrophorus americanus*	E	
Topeka Shiner*	*Notropis topeka*	E	
Northern Redbelly Dace	*Phoxinus eos*		T
Sturgeon Chub*	*Macrohybopsis gelida*		T
Sicklefin Chub	*Macrhybopsis meeki*		E
Swift Fox*	*Vulpes velox*		T
Northern River Otter*	*Lontra canadensis*		T
False Map Turtle	*Graptemys pseugogeographica*		T

1/E=endangered, T=threatened
2/For South Dakota only; North Dakota does not maintain a separate State list of species
* Species may occur on Lake Oahe project lands, but there are no current records (Personal communication, Doug Backlund, SDNHP).

3.13.1 Federally Listed Species

3.13.1.1 Least Tern

Least terns begin arriving on Lake Oahe about three to four weeks after the piping plovers with the earliest birds being seen around the third week in May. Least terns are often found nesting in the same locations as piping plovers. Surprisingly, this includes many of the shoreline beaches of the lake as least terns primarily nest on riverine sites. In addition to nesting on the sandbars exposed in the upper reach of the lake (Gravel Pit to Mary's Bend), least terns are also found frequently at Cheyenne River Arm (RM 1110),

Forest City (RM 1150), Swiftbird Bay (RM 1160), Kenel Flats (RM 1232), Stateline Bay (RM 1233), Porcupine Islands (RM 1248) and Dredge Island (RM 1270).

An adult census has been conducted for least terns annually on Lake Oahe since 1988. Adult numbers have varied from a low of 57 in 1999 to a high of 192 in 1991 with an annual average of 115 adults. Productivity monitoring has been conducted on the lake since 1992. The number of fledglings has varied from a low of 0 in 1995 to a high of 73 in 2006 with an annual average of 37 fledglings. In 2009, 63 adults and 34 fledglings were counted on the lake.

3.13.1.2 Piping Plover

Piping plovers arrive on Lake Oahe in early May and are found the length and breadth of lake, nesting as far south as Peoria Flats just north of the dam to the northern boundary of the project, Mary's Bend (RM 1304), just south of Bismarck, ND. The plovers nest primarily along the reservoir shorelines, but during times of low lake levels they will nest on exposed sandbars of the old river channel. Depending on the lake level, favored nesting areas include Peoria Flats (RM 1183), Sully Flats (RM 1095), Mission (RM 1106), Cheyenne River Arm (RM 1110), Little Bend (RM 1111), Forest City (RM 1150), Swiftbird Bay (RM 1160), Blue Blanket (RM 1189), Kenel Flats (RM 1232), Stateline Bay (RM 1233), Porcupine Islands (RM 1248), Dredge Island (RM 1270) and numerous sandbars from the Gravel Pit (RM 1265) to Mary's Bend (RM 1304).

An adult census has been conducted for piping plovers annually on Lake Oahe since 1988. Adult numbers have varied from a low of 21 in 1996 to a high of 372 in 2004 with an annual average of 160 adults. Productivity monitoring has been conducted on the lake since 1992. The number of fledglings has varied from a low of 7 in 1999 to a high of 277 in 2003 with an annual average of 109 fledglings. In 2009, 150 adults and 37 fledglings were counted on the lake.

3.13.1.3 Whooping Crane

Whooping cranes have been known to use the project during migration. Areas such as Lake Pocasse, Fort Sully Flats, and Peoria Flats are preferred resting areas. The cranes use cropland and pasture, wet meadows, shallow marshes, shallow portions of rivers, lakes and reservoirs, and alkali basins for both feeding and loafing. This species does not breed in South Dakota. Several sightings are recorded for the project area counties in the SDNHP database (2002), including a sighting in 2001 in Hughes County. In North Dakota, the last whooping crane to be spotted was observed in 1972 in Emmons County (NDNHP 2006).

3.13.1.4 Black-Footed Ferret

Black-footed ferret habitat includes open areas of grasslands, steppe, and shrub steppe (prairie dog habitat). Black-footed ferrets dwell in prairie dog towns, raise 2-5 young in prairie dog burrows and prey almost exclusively on prairie dogs. They are rarely observed

anywhere but prairie dog towns (Ashton and Dowd 1997). Several sightings for the black-footed ferret are listed in the SDNHP database (2002), but the most recent sighting was in 1972. Since then this small mammal has been extirpated from the project area. However, they were recently reintroduced into areas adjacent to project lands, including Badlands National Park and Buffalo Gap National Grasslands, and the Cheyenne River Sioux Tribe reservation (USFWS 2005).

3.13.1.5 Pallid Sturgeon

Pallid sturgeon sightings on Lake Oahe within the State of South Dakota have become extremely rare over the past 10 to 15 years. The North Dakota portion of Lake Oahe has not had a pallid sturgeon sighting since 1976 in Sioux County (NDNHP 2006). The Oahe tailrace area has existing sturgeon. The most recent sighting recorded in the SDNHP database (2002) for pallid sturgeon was in 2001 in Hughes County.

3.13.1.6 American Burying Beetle

Populations of the American burying beetle are not known to exist in the area and there are no occurrences recorded in the SDNHP or NDNHP databases (2002, 2006).

3.13.1.7 Topeka Shiner

Topeka shiners inhabit small, quiet pools in clear upland creeks with mostly sand, gravel, or rubble substrates. In South Dakota, the USFWS contends that the Topeka shiner was historically present in Corson and Dewey Counties. However, the SDNHP does not list any occurrences of this species in its database (2005) and the SDNHP does not think that Topeka shiners historically occurred in Corson and Dewey counties (SDGFP 2005). According to the SDNHP, there is a published report that reports some specimens, but those specimens are lost, they were collected in habitat that is not typical of Topeka shiner, and no one before or since has reported the species from that area of the state, even though there has been plenty of inventory work done there. The NDNHP does not have any records of the Topeka shiner (NDNHP 2006).

3.13.2 State Listed Species

3.13.2.1 Northern Redbelly Dace

According to Ashton and Dowd (1997) the northern redbelly dace, a small freshwater fish, prefers spring-fed streams in the Big Sioux, Minnesota, Niobrara, and Crow Creek drainages in South Dakota. This species is found in the northern United States and Canada in boggy lakes, creeks, and ponds. It is often found in tea-colored, slightly acidic water. A single occurrence, in 1973, is noted in the SDNHP database (2002) for Walworth County.

3.13.2.2 Sturgeon Chub

The sturgeon chub historically occurred in the Missouri River drainage from Montana to the Mississippi River and in the Mississippi River drainage to the mouth of the Ohio. In South Dakota, it has been found in the Missouri, White, Cheyenne, Grand, and Little Missouri Rivers (Ashton and Dowd 1997). This species prefers swift current areas with channels of large silty rivers, usually over gravel bottoms (*ibid*). The most recent occurrence of sturgeon chub was recorded in 1997 for Haakon and Ziebach Counties (SDNHP 2002). Prior to that, the database shows only two other occurrences for the species, both dated 1952.

3.13.2.3 Sicklefin Chub

According to Ashton and Dowd (1997), the sicklefin chub's distribution is approximately the same as that of the sturgeon chub, but the sicklefin may be more common. In South Dakota, this species may be restricted to the Missouri River below Ft. Randall Dam or its tributary entrances. The sicklefin chub's preferred habitat includes main channels of large turbid rivers in areas of strong current over sand or fine gravel. Only two sightings are recorded in the SDNHP database (2002), both dated 1952.

3.13.2.4 Swift Fox

The swift fox historically ranged from Canada to northern Texas, but has vanished from much of this range (Sovada and Scheik 1999). The swift fox inhabits open prairies, plains, and shrubby desert areas away from extensively cultivated land. It is usually found in areas with gently rolling hills or undulating topography. In South Dakota, swift fox prefer short to midgrass prairies (Ashton and Dowd 1997). The SDNHP reports a swift fox sighting in Stanley County in 1992, but the remaining sightings occur prior to 1979 (SDNHP 2002). This species may be present as an incidental visitor to the project area on extremely rare occasions.

3.13.2.5 River Otter

Northern river otters are found in and along streams, lakes, swamps, marshes, and the seashore (Csuti et al. 2001). The river otter is found in rivers, ponds, lakes, and unpolluted waters in wooded areas. Key habitat components are riparian vegetation, temporary den and resting sites (cavities under tree roots, shrub patches, tallgrass) and adequate food (Ashton and Dowd 1997). In South Dakota it occurs along the Missouri River (*ibid*). Occurrences have been recorded as recently as 1998 and 1999 in Stanley and Haakon Counties of South Dakota (SDNHP 2002).

3.13.2.6 False Map Turtle

Distribution of the false map turtle includes the Mississippi, Missouri, and Ohio River drainages. The false map turtle may be more abundant than previously thought and

inventories of Missouri River system habitats are needed to more accurately determine its abundance in South Dakota (Ashton and Dowd 1997). The SDNHP (2002) lists five occurrences of the false map turtle in the project area, including two in 1997.

3.14 Visual Qualities

The Oahe project adds a tremendous visual diversity to both South Dakota and North Dakota. The highly irregular and rugged shoreline on the lower portion to the more rolling and gentle shoreline on the upper portion of the project and the open water of Lake Oahe itself are all attractive visual resources. From the dam to Mobridge, the lake is surrounded by high rough bluffs that permit numerous outstanding vistas of the lake and surrounding prairie grasslands. The most prominent feature is the line of the horizon - where skies join the open expanse of land. From Mobridge north, the lake takes on more of the quality of a wide river, with a gentler shoreline and only moderately high banks. The pristine quality of many areas along the lake offers a desirable attraction to sightseers, campers, and sportsmen alike.

Before the construction of Oahe Dam, the Missouri River floodplain was covered with dense stands of trees and fertile bottomlands. The uplands were characterized by miles of prairie rangeland. Today the stands of trees and bottomlands have been replaced by rugged bluffs and the open water of the reservoir. In the upstream reaches of the reservoir within North Dakota, there are still numerous stands of cottonwood, elm, and willow in the original river bottomlands not inundated by the lake.

Large numbers of waterfowl, wading birds, and shorebirds use the waters of Lake Oahe during migration. Deer and pronghorn roam the uplands. Many areas provide habitat and food for both large and small game. Most visitors to the project have an opportunity to view several species of wildlife. With its approximately 2,200 miles of shoreline, Lake Oahe provides an excellent setting for various kinds of outdoor-recreation activities.

The only significant intrusions on the area's aesthetic resources are the large power transmission lines and supporting stations. However, these structures occur mostly in the vicinity of the Oahe dam and power plant.

3.15 Air Quality

The counties in which the proposed predator management would occur are all in attainment with the National Ambient Air Quality Standards (NAAQs) (NDDH 2008, SDDENR 2008). Parameters that have been measured include levels of particulate matter, ozone, lead, sulfur dioxide, nitrogen dioxide, and air toxics.

3.16 Noise

Noise conditions in the Oahe project area vary depending on recreational usage. Noise levels are generally low and characteristic of a natural setting where intrusion of man-made noise is infrequent and typically of short duration.

Some recreation activities with the potential to produce enough noise to disturb other recreationists include hunting, boat cruising, and waterskiing. At the Oahe project, there are two areas designated for off-road vehicle (ORV) use. These areas are located at the West Shore Recreation Area and on the outer edges of the Kimball Bottom Recreation Area. These areas receive significant use by local clubs as well as individuals and small groups.

3.17 Paleontology

The Missouri River trench is internationally known for fossil vertebrate and invertebrate remains. The vertebrates along Lake Oahe occur principally in the Late Cretaceous Pierre Shale. Although dinosaurs dominated the terrestrial deposits to the west, both vertebrate and invertebrate fossils were preserved in the marine deposits of the shallow seaway.

3.18 Cultural Resources

Many significant cultural resources are located on Oahe project lands. These resources represent physical remains, including historic properties, archaeological resources, sacred sites, religious sites, burial sites, properties of traditional religious and cultural importance, and Native American cultural items to including human remains, associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony.

Under the authority of National Historic Preservation Act (NHPA) of 1966, as amended March 19, 2004; the Archeological Resources Protection Act of 1979, as amended (ARPA); the Antiquities Act of 1906; the Native American Graves Protection and Repatriation Act of 1990, as amended (NAGPRA); the National Environmental Policy Act of 1969 (NEPA); and ER 1130-2-1; the Corps is mandated to protect and preserve eligible cultural resources which may be affected by the operation and management of its projects.

3.19 Socioeconomic Characteristics

South Dakota's population was 781,919 in 2006, an increase of 3.6 percent since 2000. North Dakota's population was 635,867 in 2006, a decrease of 1 percent since 2000. The populations of North Dakota and South Dakota are primarily of northern European ancestry. In South Dakota, Native Americans, most of whom are members of one of the State's nine Sioux tribes, are numerically the only significant minority. In 2006, the 67,614 Native Americans living in South Dakota constituted 8.6 percent of the State's population.

North Dakota had a smaller Native American population, with the 33,219 Native Americans representing 5.2 percent of the State's population in 2006.

Of the counties bordering Lake Oahe, Burleigh and Morton Counties in North Dakota, and, to a lesser extent, Walworth County in South Dakota, are relatively urban. Emmons County in North Dakota and bordering Campbell County in South Dakota are quite rural. Sioux County in North Dakota and bordering Corson County in South Dakota are very rural counties that together comprise the Standing Rock Sioux Reservation.

The average unemployment rates for the counties immediately adjacent to the Oahe project are lowest in the counties with larger cities and towns. The highest unemployment rates are found in the counties with limited job opportunities. This same trend also holds for the percentage of families with income below the poverty level.

3.20 Visitation and Recreation Activities

The 2006 visitation for the Oahe project was 6,118,100 visitor-hours. Visitation to designated recreation areas accounted for approximately 5,859,700 visitor-hours or roughly 95.8 percent of total visitor hours. The remaining 4.2 percent of the visitation is the estimated amount of dispersed recreational use (dispersed use is the type of recreation that occurs in those parts of the project that are not designated recreation areas, for example, from people who walk or bike on the project). Although there was a drop in visitation during the drought years of 1990-92, visitation at the Oahe project increased in 1993-94 during a fishing boom. Visitation remained high through the rest of the 1990s but started to drop in 2000 with the beginning of a drought that lowered lake water levels. Visitation dropped further following the transfer of most South Dakota recreation areas from the Corps to the SDGFP and CRST in 2002.

4 CONSEQUENCES OF THE NO ACTION ALTERNATIVE

The No Action alternative, namely continuing to abide by the 1962 Master Plan, is not legally or technically feasible. Development and management proposals in the Master Plan must be in accordance with current laws and regulations. Because it predated Title VI legislation, the 1962 Master Plan does not take into account the effects of Title VI on current and future ownership and management of lands acquired by the Federal Government for the Oahe project. Therefore, continued use of the 1962 Master Plan would not be in compliance with existing Federal laws.

5 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

The proposed action, the 2008 Master Plan update, takes into account the provisions of Title VI legislation on ownership and management of all management areas that previously comprised the Oahe Dam/Lake Oahe project. The proposed Master Plan update is a Corps

document and, therefore, does not include resource plans for management units that have been transferred to the State of South Dakota or the CRST. Overall consequences of the proposed Master Plan update would be expected to be positive. Potential effects that cover activities on lands for which the Corps is responsible are detailed below (Table 3).

Table 3. Summary of Impacts for the No Action and Preferred Alternatives.

Affected Area	No Action Alternative	Preferred Alternative
Lake Operation	The Master Plan does not affect Lake Operation. The Corps would continue to operate Lake Oahe in coordination with other Missouri River reservoirs under the Missouri River Mainstem System Master Water Control Manual (Master Manual).	Same as the No Action Alternative.
Hydrology	No impacts anticipated.	No impacts anticipated.
Ice Affected Flows	No impacts anticipated.	No impacts anticipated.
Sedimentation and Shoreline Erosion	The Corps would not implement measures to reduce erosion at several management units at which erosion is severe.	The Corps would install riprap or implement other measures such as plant shoreline vegetation at up to 25 management units that have resource objectives or development needs to protect the units from erosion.
Surface Water Quality	The Corps would continue to participate in the TMDL process for the Missouri River. No improvements to water supplies or treatment.	The Corps would continue to participate in the TMDL process for the Missouri River. Dredging may be required to maintain access to the boat ramp at Hazelton RA. Dredging would require Federal and State permits. Dredged materials would be disposed of on approved upland sites and be tested and treated for contaminants if required in accordance with the North Dakota Department of Health and South Dakota Department of Environment and Natural Resources requirements.

Accessibility	The Corps would continue to maintain existing roads.	The Corps proposes to provide additional parking as warranted; improve internal circulation roads and signs. The Corps would locate parking lots at an elevation that is high enough that is unlikely to be flooded and would follow environmental laws when constructing any new roads or parking lots. Environmental impacts would be minimized.
Climate	No impacts anticipated.	No impacts anticipated.
Topography, Geology, Soils	No impacts anticipated.	No impacts anticipated.
Vegetation Resources	Recreation area development is unlikely to impact native vegetation since the areas are already disturbed. The Corps would continue with limited tree planting and re-vegetation plans.	Same construction impacts as the No Action Alternative. The Preferred Alternative proposes increased tree planting, developing additional woody draw habitat and shoreline vegetation, and controlling noxious weeds. These actions would have a beneficial effect on vegetation.
Fish	No impacts anticipated.	The Corps proposes to manage vegetation for optimum use of wildlife and fisheries when water returns.
Wildlife	No impacts anticipated.	The Preferred Alternative proposes upgrading the quality of habitat for upland and big game species and waterfowl; supplementing the native food sources for upland and big game species and waterfowl; establishing food sources to supplement existing food; increasing the amount of

		dense nesting cover for upland game; and managing vegetation for optimum use of wildlife and fisheries when water returns. These actions would have a beneficial effect on wildlife.
Aquatic Nuisance Species	No impacts anticipated.	The Corps would cooperate with other agencies to educate the public about aquatic nuisance species and work to minimize their distribution and ecological impacts.
Endangered, Threatened, and Rare Species and Communities	No impacts anticipated.	The Corps would protect any state or federally listed threatened and endangered species that may periodically use the area; manage vegetation for optimum use of threatened and endangered species and other wildlife and fisheries; and improve habitat for least tern and piping plover. The 2003 Amended Biological Opinion called for evaluating the potential for creating habitat for the least tern and piping plover within the reservoir to supplement natural habitat. These actions would benefit endangered, threatened, and rare species and communities in the Oahe project area and would be coordinated with the FWS and other relevant agencies.
Visual Qualities	No impacts anticipated.	Proposed projects that would benefit visual qualities at the Oahe project area include planting shoreline vegetation where feasible

		to control erosion and to improve the overall esthetic quality of the area and planting trees and shrubs between One Mile Bay and the Fort Yates causeway as a screening buffer. These actions would benefit the visual qualities at the Oahe project.
Air Quality	Minor, temporary dust impacts during construction of improvements at recreation areas.	Same as the No Action Alternative.
Noise	Minor temporary noise increases during construction of improvements at recreation areas.	Same as the No Action Alternative.
Paleontology	Resources would continue to be managed under existing policies and regulations.	Same as the No Action Alternative.
Cultural Resources	Cultural resources could be disturbed during construction of facility improvements. The Corps would implement measures in the Cultural Resource Management Plan and require contractors to report any cultural artifacts discovered during ground-disturbing activities. Resource objectives and development needs for each of the management units includes protecting	Same as the No Action Alternative.

	any cultural resources.	
Socioeconomic Characteristics	Provides few opportunities for economic development.	Proposed improvements at high density recreation areas would increase economic development by attracting more visitors to Lake Oahe.
Visitation and Recreation Activities	On-going upgrades to recreation areas would improve facilities for visitors.	Improved and expanded recreational facilities would help meet future increased demand. Proposed additions to camping facilities would increase the number of sites and also expand the type of camping sites available. Additional boat docks and small marinas would improve boat access to Lake Oahe.
Environmentally Sensitive Areas	No impacts anticipated.	No impacts anticipated.

6 POTENTIAL CUMULATIVE EFFECTS

Cumulative effects, as defined by the Council on Environmental Quality for NEPA, are those impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of the agency of persons undertaking these actions. The scope of this cumulative effects analysis includes the impact of land reclassification under the proposed Master Plan on lands surrounding Lake Oahe.

a. Past Actions. Numerous cumulative effects from previous actions have occurred throughout the Lake Oahe area and have impacted wildlife habitat and other aspects of the environment, including hydrology, water quality, and cultural resources. Construction of Oahe Dam; filling of Lake Oahe; construction of the additional five main stem dams on the Missouri River; management of the Missouri River for flood control, navigation, water supply, and hydropower; development of the Missouri River floodplain for agricultural and residential uses; and alteration of the Missouri River channel have caused dramatic changes to the entire Missouri River system. These anthropogenic changes have caused cumulative effects to resources, ecosystems, and human communities. The Missouri River system is now primarily a passive, controlled system with reduced natural communities and habitats. Without a complete restoration of the Missouri River basin to its original ecological condition, these cumulative effects will not be reversed.

b. Present and Future Actions Associated with the Master Plan Alternatives. Implementation of proposals for Corps-owned areas in the updated Master Plan will ensure insignificant cumulative effects consistent with the Environmental Operating Principles (ER 200-2-2, Environmental Quality – Procedures for Implementing the National Environmental Policy Act (NEPA), 30 Oct 2003). Principle #5 specifically states that the Corps will "Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work." It discusses the environmental direction when developing project lands, recreation areas designed with high carrying capacities so visitor use can be concentrated away from resource-oriented areas, greater environmental protection and improvement of wildlife habitat, and greater maintenance of sustainable resources.

Through the use of these principles for development within the Lake Oahe area the Corps will provide for increased protection and improvement of the natural resources and ecological communities while also meeting recreation demands and other purposes.

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7 REFERENCES

Ashton, Diane E. and Eileen M. Dowd. 1997. Fragile legacy. Endangered, threatened and rare animals of South Dakota. South Dakota Department of Game, Fish and Parks, Report No. 91-04. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page.http://www.npwrc.usgs.gov/resource/distr/others/sdrare/sdrare.htm (Version 8DEC97).

Bailey, R.G. 1995. Description of Ecoregions of the United States. http://www.fs.fed.us/land/ecosysmgmt/ecoreg1_home.html Accessed December 16, 2005.

Csuti, Blair, O'Neil, Thomas A., Shaughnessy, Margaret M., Gaines, Eleanor P., Hak, John C. 2001. Atlas of Oregon Wildlife Distribution, Habitat and Natural History. 2nd ed. Oregon State University Press, Corvallis, OR.

NDDH (North Dakota Department of Health). 2008. Personal communication via email with Justin Mayer, Manager, Air Quality Section, June 24, 2008.

NDGF (North Dakota Game and Fish Department). 2005. North Dakota Statewide Aquatic Nuisance Species (ANS) Management Plan.

NDNHP (North Dakota Natural Heritage Program). 2006. Personal communication with Christine Dirk. November 21, 2006.

Rumble, M.A., and Gobeille, J.E. 2004. Avian use of successional cottonwood (Populus deltoides) woodlands along the middle Missouri River. American Midlands Naturalist 152:165-177.

SDDENR (South Dakota Department of Environment and Natural Resources). 2008. Personal communication via email with Brad Schultz, June 27, 2008.

SDGFP. 2005. Personal communication, Doug Backlund, information on South Dakota threatened and endangered species, by email, December 21, 2006.

SDGFP. 2008. South Dakota Aquatic Nuisance Species Management Plan. http://www.sdgfp.info/Wildlife/AquaticNuisance/SDANSManagementPlan.aspx

SDNHP (South Dakota Natural Heritage Program). 2002. Natural heritage program database.

Sovada, M.A. and Scheick, B.K. 1999. Preliminary report to the swift fox conservation team: historic and recent distribution of swift foxes in North America. In: C.G. Schmitt (ed.) Annual report of the swift fox conservation team. pp: 80-147. New Mexico Department of Game and Fish, Albuquerque, NM, USA.

U.S. Army Corps of Engineers (USACE). 1995. Design Memorandum MB-90, Master Plan, Big Bend Dam/Lake Sharpe, Missouri River, South Dakota. USACE, Omaha District. Updated March 1995.

USACE. 2000. Final Environmental Assessment for the Lease of 22 Recreation Areas at Lake Oahe, Lake Francis Case, and Lewis and Clark Lake to the State of South Dakota. USACE, Omaha District. December 2000.

USACE. 2001a. Final Environmental Impact Statement, Title VI Land Transfer to the State of South Dakota. Prepared for USACE, Omaha District by Mangi Environmental Group, Inc. 2 Volumes. November 2001.

USACE. 2001b. Revised Draft Environmental Impact Statement, Missouri River Master Water Control Manual. USACE, Northwestern Division. August 2001.

USACE. 2008. Section 303(d) listed waters in the Omaha District. https://w3.nwo.usace.army.mil/hydro/water_quality/district_water_quality_concerns/section_303(d)_listed_waters.html. Accessed July 3, 2008.

USFWS. 2003. U. S. Fish and Wildlife Service 2003 Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System.

USFWS. 2005. http://southdakotafieldoffice.fws.gov/endsppbycounty.htm

APPENDIX A:
COMPLIANCE WITH ENVIRONMENTAL AND CULTURAL RESOURCES STATUTES

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COMPLIANCE WITH ENVIRONMENTAL STATUTES

In Compliance	Not Applicable.	
☒	☐	40 Stat. 755, 13 July 1918, Migratory Bird Treaty Act (MBTA), as amended.
☒	☐	54 Stat. 250, 8 June 1940, Bald Eagle Protection Act of 1940, as amended.
☐	☒	Public Law 83-566 (68 Stat. 666), 5 August 1954, Watershed Protection and Flood Prevention Act.
☒	☐	Public Law 85-624 (72 Stat. 563), 12 August 1958, Fish and Wildlife Coordination Act.
☒	☐	Public Law 86-717 (74 Stat. 817), 6 September 1960, Conservation of Forest Lands in Reservoir Areas.
☒	☐	Public Law 87-88 (75 Stat. 204), 20 July 1961, Federal Water Pollution Control Act Amendments of 1961, as amended.
☐	☒	Public Law 88-578 (78 Stat. 897), 3 September 1964, Land and Water Conservation Fund Act, as amended.
☒	☐	Public Law 89-80 (79 Stat. 244), 20 July 1965, Water Resources Planning Act.
☒	☐	Public Law 90-483 (82 Stat. 731), 13 August 1968, River and Harbor Act of 1968, as amended.
☐	☒	Public Law 90-542 (82 Stat. 906), 2 October 1968, Wild and Scenic Rivers Act, as amended.
☒	☐	Public Law 90-583 (82 Stat. 1146), 17 October 1968, Noxious Plant Control.
☒	☐	Public Law 91-190 (83 Stat. 852), 1 January 1970, National Environmental Policy Act of 1969.
☒	☐	Public Law 91-224 (84 Stat. 114), 3 April 1970, Environmental Quality Improvement Act of 1970.

In Compliance	Not Applicable.	
☒	☐	Public Law 91-604 (84 Stat. 1676), 31 December 1970, Clean Air Act, as amended.
☒	☐	Public Law 92-500 (86 Stat. 816), 18 October 1972, The Federal Water Pollution Control Act Amendments of 1972, as amended.
☒	☐	Public Law 92-574 (86 Stat. 1234), 27 October 1972, Noise Control Act, as amended.
☒	☐	Public Law 93-205 (87 Stat. 884), 28 December 1973, Conservation, Protection, and Propagation of Endangered Species Act of 1973, as amended.
☒	☐	Public Law 93-523 (88 Stat. 1660), 16 December 1974, Safe Drinking Water Act, as amended.
☒	☐	Public Law 93-629, (88 Stat. 2148), 3 January 1975, Federal Noxious Weed Act of 1974, as amended.
☒	☐	Public Law 95-217 (91 Stat. 1566), 27 December 1977, Clean Water Act of 1977, as amended.
☒	☐	Public Law 95-632 (92 Stat. 3751), 10 November 1978, Endangered Species Act Amendments of 1978.
☒	☐	Public Law 96-159 (93 Stat. 3751), 28 December 1979, Endangered Species Act of 1973, as amended.
☒	☐	Public Law 96-366 (94 Stat. 1322), 29 September 1980, Fish and Wildlife Conservation Act of 1980.
☐	☒	Public Law 96-510 (94 Stat. 2797), 11 December 1980, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
☒	☐	Public Law 97-98 (95 Stat. 1341), 22 December 1981, Farmland Protection Policy Act.
☒	☐	Public Law 99-339 (100 Stat. 642), 19 June 1986, Safe Drinking Water Act Amendments of 1986.

In Compliance	Not Applicable.	
☒	☐	Public Law 100-4 (101 Stat. 7), 4 February 1987, Water Quality Act of 1987.
☒	☐	Public Law 101-233 (103 Stat. 1968), 13 December 1989, North American Wetlands Conservation Act.
☒	☐	Public Law 104-182 (110 Stat. 1613), 6 August 1996, Safe Drinking Water Act Amendments of 1996.
☒	☐	Public Law 109-320 (120 Stat. 1748), 11 October 2006, Salt Cedar and Russian Olive Control Demonstration Act.
☐	☒	CEQ Memorandum, 10 August 1980, Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory.
☒	☐	Executive Order 11644, 8 February 1972, Use of Off-Road Vehicles on Public Lands.
☒	☐	Executive Order 11989, 24 May 1977, Off-Road Vehicles on Public Lands.
☒	☐	Executive Order 11988, 24 May 1977, Floodplain Management.
☒	☐	Executive Order 11990, 24 May 1977, Protection of Wetlands.
☒	☐	Executive Order 12088, 13 October 1978, Federal Compliance with Pollution Control Standards.
☒	☐	Executive Order 12692, 7 June 1995, Recreational Fisheries.
☒	☐	Executive Order 13112, 3 February 1999, Invasive Species.
☒	☐	Executive Order 13148, 26 April 2000, Greening the Government Through Leadership in Environmental Management.

In Compliance	Not Applicable.	
☒	☐	Executive Order 13195, 18 January 2001, Trails for America in the 21st Century.
☒	☐	Executive Order 13352, 26 August 2004, Facilitation of Cooperative Conservation.
☒	☐	Executive Order 13423, 24 January 2007, Strengthening Federal Environmental, Energy, and Transportation Management.
☒	☐	Executive Order 13443, 17 Aug 2007, Facilitation of Hunting Heritage and Wildlife Conservation.

COMPLIANCE WITH CULTURAL RESOURCE STATUTES

In Compliance	Not Applicable.	
☒	☐	Public Law 59-209 (34 Stat. 225), 8 June 1906, The Antiquities Act.
☒	☐	Public Law 86-523 (74 Stat. 220), 27 June 1960, Reservoir Salvage Act, as amended.
☒	☐	Public Law 89-665 (80 Stat. 915), 15 October 1966, National Historic Preservation Act (NHPA), as amended.
☒	☐	Executive Order 11593, 13 May 1971, Protection and Enhancement of the Cultural Environment.
☒	☐	Public Law 93-291 (88 Stat. 174), 24 May 1974, Preservation of Historical and Archeological Data.
☒	☐	Public Law 95-341 (92 Stat. 469), 11 August 1978, American Indian Religious Freedom Act (AIRFA) of 1978.
☒	☐	Public Law 95-625. 10 November 1978. National Trails System Act.
☒	☐	Public Law 96-95 (93 Stat. 721), 31 October 1979, Archaeological Resources Protection Act (ARPA) of 1979.
☒	☐	Public Law 101-601 (104 Stat. 3042), 16 November 1990, Native American Graves Protection and Repatriation Act (NAGPRA).
☒	☐	Executive Order 12898, 11 February 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.
☒	☐	Executive Order 13006, 21 May 1996, Locating Federal Facilities on Historic Properties.

In Compliance	Not Applicable.	
☒	☐	Executive Order 13007, 24 May 1996, Indian Sacred Sites.
☒	☐	Executive Order 13175, 6 November 2000, Consultation and Coordination with Indian Tribal Governments.
☒	☐	Executive Order 13287, 3 March 2003, Preserve America.

40 Stat. 755, 13 July 1918, Migratory Bird Treaty Act (MBTA), as amended. *In compliance*. The MBTA of 1918 is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent overutilization. Executive Order 13186 (2001) directs executive agencies to take certain actions to implement the Act. When development proposed in the updated Master Plan is scheduled to occur, compliance with the MBTA will be considered along with environmental compliance for the specific activities.

54 Stat. 250, 8 June 1940, Bald Eagle Protection Act of 1940, as amended. *In compliance*. This Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The Act defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Individual projects proposed as a result of the Master Plan would adhere to the Management Guidelines developed by the USFWS to avoid disturbing bald eagles.

Public Law 83-566 (68 Stat. 666), 5 August 1954, Watershed Protection and Flood Prevention Act. *Not applicable*. This Act authorizes the Secretary of Agriculture to cooperate with States and other public agencies in works for flood prevention and soil conservation, as well as the conservation, development, utilization, and disposal of water. This Act imposes no requirements on Corps Civil Works projects.

Public Law 85-624 (72 Stat. 563), 12 August 1958, Fish and Wildlife Coordination Act. *In compliance*. This law amends and renames the Fish and Wildlife Coordination Act of 10 March 1934. The 1958 Act requires that fish and wildlife conservation receive equal consideration with other features of water resources development programs; that proposals for work affecting any body of water be coordinated with the USFWS and State wildlife agency; that recommendations of the USFWS and State wildlife agency be given full consideration; and that justifiable means and measures for wildlife purposes, including mitigation measures, be adopted. It also required that adequate provisions be made for the use of project lands and waters for the conservation; maintenance; and management of wildlife resources, including their development and improvement. The Act provides that the use of project lands primarily for wildlife management by others be in accordance with a General Plan approved jointly by the Department of the Army, Department of the

Interior, and State wildlife agencies. When site-specific proposals are made under the Master Plan, the Corps will coordinate with the USFWS and NDGF or SDGFP.

Public Law 86-717 (74 Stat. 817), 6 September 1960, Conservation of Forest Lands in Reservoir Areas. *In compliance*. This law provides for the development and maintenance of forest resources on Corps-managed lands and the establishment and management of vegetative cover so as to encourage future resources of readily available timber and to increase the value of such areas for conservation. Resource objectives and development needs for the management units include planting trees and shrubs to increase the amount of woody vegetation for winter and nesting cover for upland and big game species; planting trees, food plots, native grasses, and/or marsh grasses to supplement the existing food sources for upland and big game species and/or waterfowl; and developing additional woody draw habitat.

Public Law 87-88 (75 Stat. 204), 20 July 1961, Federal Water Pollution Control Act Amendments of 1961, as amended. *In compliance*. Section 2 (b) (1) of this Act gives the Corps responsibility for water quality management of Corps reservoirs. This law was amended by the Federal Water Pollution Control Act Amendment of 1972, Public Law 92-500.

Public Law 88-578 (78 Stat. 897), 3 September 1964, Land and Water Conservation Fund Act, as amended. *Not applicable*. Planning for recreation development at Corps projects is coordinated with the appropriate States so that the plans are consistent with public needs as identified in the SCORP. The Corps must coordinate with the National Park Service (NPS) to ensure that no property acquired or developed with assistance from this Act will be converted to other than outdoor recreation uses. If conversion is necessary, approval of NPS is required, and plans are developed to relocate or re-create affected recreational opportunities. No Land and Water Conservation funds have been used at the Oahe project to date.

Public Law 89-80 (79 Stat. 244), 20 July 1965, Water Resources Planning Act. *In compliance*. This Act is a Congressional Statement of policy to meet rapidly expanding demands for water throughout the Nation. The purpose is to encourage the conservation, development, and use of water-related land resources on a comprehensive and coordinated basis by the Federal, State, and local governments; individuals; corporations; business enterprises; and others concerned. The Corps held public workshops attended by federal, State, and local representatives and members of the general public (including members of the business community) and invited public comments to gather public input on the Master Plan and EA.

Public Law 90-483 (82 Stat. 731), 13 August 1968, River and Harbor Act of 1968, as amended. *In compliance*. This Act authorizes the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and other purposes. Section 210 restricts the collection of entrance fees at Corps lakes and reservoirs

after 31 March 1970 to users of highly developed facilities requiring the continuous presence of personnel. Because the Corps will be conducting any projects under the updated Master Plan, no authorization is required because the law specifically exempts the Corps from regulation under Section 10. However, activities by non-Corps entities in waters of the U.S. at the Oahe project are regulated under Section 10. Work such as a boat dock installation or water intake line requires a Section 10 permit application; for work that includes placing fill, a joint Section 404/10 permit application can be made.

Public Law 90-542 (82 Stat. 906), 2 October 1968, Wild and Scenic Rivers Act, as amended. *Not applicable*. This Act establishes that certain rivers of the Nation, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The reach of the Missouri River where the Oahe project is located is not designated as a wild or scenic river, nor is it on the National Inventory of Rivers potentially eligible for inclusion.

Public Law 90-583 (82 Stat. 1146), 17 October 1968, Noxious Plant Control. *In compliance.* This law provides for a control of noxious weeds on land under the control of the Federal government. Resource objectives and development needs for management units include the control of noxious weeds.

Public Law 91-190 (83 Stat. 852), 1 January 1970, National Environmental Policy Act of 1969. *In compliance*. Section 101 of this Act establishes a national environmental policy. Section 102 requires that all Federal Agencies shall, to the fullest extent possible, use a systematic, interdisciplinary approach that integrates natural and social sciences and environmental design arts in planning and decision making; study, develop, and describe appropriate alternatives to recommend courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources; and include an Environmental Impact Statement (EIS) in every recommendation or report on proposals for major Federal actions significantly affecting the quality of the human environment. This EA and finding of no significant impact (FONSI) have been prepared for the proposed action. An EIS is not required.

Public Law 91-224 (84 Stat. 114), 3 April 1970, Environmental Quality Improvement Act of 1970. *In compliance*. This Act assures that each Federal department or agency conducting or supporting public works activities which affect the environment shall implement the policies established under existing law. The Corps ensures that activities at the Oahe project are in compliance with existing laws.

Public Law 91-604 (84 Stat. 1676), 31 December 1970, Clean Air Act, as amended. *In compliance*. The purpose of this Act is to protect public health and welfare by the control of air pollution at its source, and to set forth primary and secondary National Ambient Air Quality Standards (NAAQS) to establish criteria for States to attain, or maintain. Some

temporary emission releases may occur during construction activities that occur under the Master Plan update; however, air quality is not expected to be impacted to any measurable degree. Data from the NDDH and SDDENR ambient air quality monitoring program indicate that pollutant concentrations are well within the Federal and State NAAQS set at levels to protect human health and welfare.

Executive Order 11644, 8 February 1972, Use of Off-Road Vehicles on Public Lands. *In compliance*. This Executive Order establishes a uniform Federal policy regarding the use of vehicles such as trail bikes, snowmobiles, dune buggies, and others on public lands. Section 3 of this Order provides guidance for establishing zones of use for such vehicles. This Order was amended by Executive Order 11989. Currently the Corps restricts ORV use on project lands.

Public Law 92-500 (86 Stat. 816), 18 October 1972, The Federal Water Pollution Control Act Amendments of 1972, as amended. *In compliance*. This law amends the Federal Water Pollution Control Act and establishes a national goal of eliminating pollutant discharges into waters of the United States. Section 404 authorizes a permit program for the disposal of dredged or fill material in the Nation's waters that is to be administered by the Secretary of the Army acting through the Chief of Engineers. This law was later amended by the Clean Water Act of 1977, Public Law 95-217, to provide additional authorization to restore the Nation's water. The project is in compliance with this law. If any construction activities involve the temporary or permanent placement of dredged or fill material into any waterbody or wetland area at Lake Oahe, a permit pursuant to Section 404 is required.

Public Law 92-574 (86 Stat. 1234), 27 October 1972, Noise Control Act, as amended. *In compliance*. This Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. Federal agencies are required to limit noise emissions to within compliance levels. Noise emission levels at sites where development was proposed in the updated Oahe Master Plan would increase above current levels temporarily during periods of construction; however, appropriate measures will be taken to keep the noise level within the compliance levels.

Public Law 93-205 (87 Stat. 884), 28 December 1973, Conservation, Protection, and Propagation of Endangered Species Act of 1973, as amended. *In compliance*. This law repeals the Endangered Species Conservation Act of 1969. It also directs all Federal departments/agencies to carry out programs to conserve endangered and threatened species of fish, wildlife, and plants and to preserve the habitat of these species in consultation with the Secretary of the Interior. This Act establishes a procedure for coordination, assessment, and consultation. This Act was amended by Public Law 96-159. Corps management and construction activities proposed by the updated Master Plan would have no effects on federally or state listed or candidate threatened and endangered species known to exist in Oahe project areas for which the Corps is responsible.

Public Law 93-523 (88 Stat. 1660), 16 December 1974, Safe Drinking Water Act, as amended. *In compliance*. This Act amends the Public Health Service Water Act to assure that the public is provided with safe drinking water. This law states that all potable water at civil works projects will meet or exceed the minimum standards required by law. This Act was amended by the Safe Drinking Water Act Amendments of 1986, Public Law 99-339 and 1996, Public Law 104-182. The NDDH and SDDENR work with all public water systems along Lake Oahe to ensure they comply with this Act.

Public Law 93-629, (88 Stat. 2148), 3 January 1975, Federal Noxious Weed Act of 1974, as amended. *In compliance*. Section 15, added to the Act in 1990, requires noxious weed control management on Federal lands and sets forth the process by which it is to be accomplished. Resource objectives and development needs for management units in the updated Master Plan/EA include the control of noxious weeds.

Executive Order 11989, 24 May 1977, Off-Road Vehicles on Public Lands. *In compliance*. This Executive Order excludes any fire, military, emergency or law enforcement vehicle when used for emergency purposes, and any combat or combat support vehicle when used for national defense purposes, from the definition of ORV. This Order also directs agencies to immediately close ORV trails that are causing soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources of particular areas or trails on public lands, to the type of ORV causing the adverse effects, until the effects have been eliminated and measures have been implemented to prevent future recurrence. Currently the Corps restricts ORV use on project lands.

Executive Order 11988, 24 May 1977, Floodplain Management. *In compliance*. This Order outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency shall evaluate the potential effects of actions on floodplains and should not undertake actions that directly or indirectly induce growth in the floodplain, unless there is no practical alternative. Agency regulations and operating procedures for licenses and permits should include provisions for evaluation and consideration of flood hazards. Construction of structures and facilities on floodplains must incorporate flood proofing and other accepted flood protection measures. Agencies shall attach appropriate use restrictions to property proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties.

Any development proposed in the updated Master Plan/EA must be in compliance with Northwestern Division (NWD) Regulation 1110-2-5, Land Development Guidance at Corps Reservoir Projects, dated April 30, 2004. This regulation establishes NWD guidance for evaluating land development proposals within Corps reservoir projects with authorized flood storage allocations. The Corps has responsibility to assure that the authorized project purposes are not compromised, that the public is not endangered, and that natural and cultural resources associated with project lands are not harmed, in accordance with applicable Federal and State regulations. The criteria and procedures for evaluation of development proposals in this regulation are to assist in meeting these

responsibilities and complying with applicable laws and directives. Existing structures are exempted from this policy. However, significant modifications and/or replacement of existing structures are subject to this policy.

Executive Order 11990, 24 May 1977, Protection of Wetlands. *In compliance*. This Order directs Federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands. Section 2 states that agencies shall avoid undertaking or assisting in new construction located in wetlands unless there is no practical alternative. Prior to construction of any facilities proposed in the updated Oahe Dam/Lake Oahe Master Plan, a site-specific NEPA analysis, including an assessment of potential impacts to wetlands, would be coordinated with Federal and State agencies and Tribes. If a Section 404 permit is required, coordination regarding compliance with E.O. 11990 would be accomplished prior to permit issuance.

Public Law 95-217 (91 Stat. 1566), 27 December 1977, Clean Water Act of 1977, as amended. *In compliance*. This Act amends the Federal Water Pollution Control Act of 1970 and extends the appropriations authorization. The Clean Water Act is a comprehensive Federal water pollution control program that has as its primary goal the reduction and control of the discharge of pollutants into the Nation's navigable waters. The Clean Water Act of 1977 has been amended by the Water Quality Act of 1987, Public Law 100-4. Any action involving placement of fill in waters of the U.S. at the Oahe project by the Corps, a non-Corps entity, or any individual, with the exception of certain minor activities as discussed in 33 CFR Part 323.4, would require a Section 404 authorization and Section 401 water quality certification.

Executive Order 12088, 13 October 1978, Federal Compliance with Pollution Control Standards. *In compliance*. The purpose of this Order is to ensure Federal compliance with applicable pollution control standards. Section 1-4, Pollution Control Plan, in which each agency was required to submit an annual plan for the control of environmental pollution to the Office of Management and Budget, was revoked by Executive Order 13148, which was revoked by Executive Order 13423.

Public Law 95-632 (92 Stat. 3751), 10 November 1978, Endangered Species Act Amendments of 1978. *In compliance*. This law amends the Endangered Species Act Amendments of 1973. Section 7 directs agencies to conduct a biological assessment to identify threatened or endangered species that may be present in the area of any proposed project. This assessment is conducted as part of a Federal agency's compliance with the requirements of Section 102 of NEPA. The Corps will conduct biological assessments on proposed projects when necessary.

Public Law 96-159 (93 Stat. 3751), 28 December 1979, Endangered Species Act of 1973, as amended. *In compliance*. This amendment expanded the act to protect endangered plants. This amendment requires the publishing of a summary and map when proposing land as critical habitat and requires Federal agencies to ensure projects "are not likely" to

jeopardize an endangered species. In addition, it authorizes all those seeking exemptions from the act to get permanent exemptions for a project unless a biological study indicates the project would result in the extinction of a species. The Corps will ensure that any development or management activities proposed in the updated Master Plan are not likely to jeopardize an endangered species. Although there are currently no threatened or endangered plants at the Oahe project, the Corps will protect any plants on project lands that are on the threatened and endangered species list in the future.

CEQ Memorandum, 10 August 1980, Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory. *Not applicable*. This memorandum states that each Federal agency shall take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory (45 FR 59189). No portion of the Oahe project is listed on the Nationwide Rivers Inventory.

Public Law 96-366 (94 Stat. 1322), 29 September 1980, Fish and Wildlife Conservation Act of 1980. *In compliance*. This law enables States to obtain funds to conduct inventories and conservation plans for nongame wildlife. It also encourages Federal departments and agencies to use their statutory and administrative authority to conserve and promote conservation in Oahe project by including resource objectives and development needs that protect and enhance wildlife habitat and reduce erosion.

Public Law 96-510 (94 Stat. 2797), 11 December 1980, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). *Not applicable*. Typically CERCLA is triggered by (1) the release or substantial threat of a release of a hazardous substance into the environment; or (2) the release or substantial threat of a release of any pollutant or contaminant into the environment that presents an imminent threat to the public health and welfare. To the extent such knowledge is available, 40 CFR Part 373 requires notification of CERCLA hazardous substances in a land transfer. Compliance with this Act is required on a case-by-case basis for real estate activities such as easements, grants, etc.

Public Law 97-98 (95 Stat. 1341), 22 December 1981, Farmland Protection Policy Act. *In compliance*. This Act instructs the Department of Agriculture, in cooperation with other departments, agencies, independent commissions and other units of the Federal government, to develop criteria for identifying the effects of Federal programs on the conversion of farmland to nonagricultural uses. The updated Master Plan/EA does not propose any changes to agricultural land.

Public Law 99-339 (100 Stat. 642), 19 June 1986, Safe Drinking Water Act Amendments of 1986. *In compliance*. These amendments provide further regulation regarding national primary drinking water, enforcement of these regulations, and variances and exemptions to the Act. These amendments also provide for the protection of underground sources of drinking water and provide grants to Tribes in addition to contract assistance to carry out

the function of these amendments. The NDDH and SDDENR enforce the amendments at public works systems throughout the State, including those along Lake Oahe.

Public Law 100-4 (101 Stat. 7), 4 February 1987, Water Quality Act of 1987. *In compliance*. This Act amends the Federal Water Pollution Control Act to not only provide for renewal of the quality of the Nation's waters but also provide construction grant amendments, standards, enforcement, permits, and licenses. This Act includes more provisions for monitoring non-point source pollution (contaminants that come from many different sources). The Corps has developed water quality management objectives for the Oahe Dam/Lake Oahe project that include intensive water quality surveys, water quality modeling, and preparation of reports that reflect current water quality conditions.

Public Law 101-233 (103 Stat. 1968), 13 December 1989, North American Wetlands Conservation Act. *In compliance*. This Act establishes the North American Wetlands Conservation Council (NAWCC, 16 U.S.C. 4403) to recommend wetlands conservation projects to the Migratory Bird Conservation Commission (MBCC). Section 9 of the Act addresses the restoration, management, and protection of wetlands and habitat for migratory birds on Federal lands. Federal agencies acquiring, managing, or disposing of Federal lands and waters are to cooperate with the USFWS to restore, protect, and enhance wetland ecosystems and other habitats for migratory birds, fish and wildlife on their lands, to the extent consistent with their missions and statutory authorities. The Master Plan proposes restoration of new wetlands at a few management units. Prior to construction of any facilities proposed in the Master Plan/EA, a site-specific NEPA analysis, including an assessment of potential impacts to wetlands, would be coordinated with Federal and State agencies and tribes.

Executive Order 12692, 7 June 1995, Recreational Fisheries. *In compliance*. This Executive Order mandates that Federal agencies, to the extent permitted by law and where practicable, improve the quality, function, and sustainable productivity and distribution of U.S. aquatic resources for increased recreational fishing opportunities. The Corps will continue to cooperate with NDGF and SDGFP to manage fisheries at Lake Oahe. Many management units include a resource objective to provide and maintain access to Lake Oahe for fishing.

Public Law 104-182 (110 Stat. 1613), 6 August 1996, Safe Drinking Water Act Amendments of 1996. *In compliance*. These amendments strengthen protections on tap water, improve public access to tap water contaminant information, strengthen standards to protect public health from the most significant threats to safe drinking water, and provide money that communities need to upgrade drinking water systems. The NDDH and SDDENR enforce the amendments at public works systems throughout the State, including those along Lake Oahe.

Executive Order 13112, 3 February 1999, Invasive Species. *In compliance*. This Executive Order directs Federal agencies to act to prevent the introduction of or to monitor and

control invasive (non-native) species, to provide for restoration of native species, to conduct research, to promote educational activities, and to exercise care in taking actions that could promote the introduction or spread of invasive species. Resource objectives and development needs for management units include the control of noxious weeds.

Executive Order 13148, 26 April 2000, Greening the Government Through Leadership in Environmental Management. *In compliance*. This Executive Order requires Federal agencies to develop and implement an Environmental Management System (EMS), which is a series of management processes and procedures that allow an organization to identify, mitigate, control, and reduce any environmental impacts from the organization's day-to-day business activities. Specifically, this Order requires each agency to develop an environmental policy statement; develop a plan for system implementation; complete a list of environmental aspects and impacts; establish objectives, targets, and programs; conduct EMS awareness training; complete a management review of the EMS; and implement the EMS before 31 December 2005. The Garrison Project has developed and implemented an EMS Plan, dated 31 December 2005, which addresses these requirements. This order was revoked by Executive Order 13423.

Executive Order 13195, 18 January 2001, Trails for America in the 21st Century. *In compliance*. This Executive Order requires Federal agencies to protect, connect, promote, and assists trails of all types throughout the United States. Several trails are proposed as part of the Master Plan. Development needs at General Sibley Park include constructing a hiking/biking trail leading through the recreation area then north into Bismarck and expanding and improving the two nature trails within the park. Fort Rick Recreation Area and Fort Yates Recreation Area include the development of hiking/biking trails as development needs. Indian Memorial Recreation Area includes the development of a series of nature trails using the existing unpaved roads south of the main campground as a development need.

Executive Order 13352, 26 August 2004, Facilitation of Cooperative Conservation. *In compliance*. This Executive Order requires that the Secretaries of the Interior, Agriculture, Commerce, and Defense and the Administrator of the EPA shall: carry out the programs, projects, and activities of the agency that they respectively head that implement laws relating to the environment and natural resources in a manner that: a) facilitates cooperative conservation; b) takes appropriate account of and respects the interests of persons with ownership or other legally recognized interests in land and other natural resources; c) properly accommodates local participation in Federal decision making; and d) provides that the programs, projects, and activities are consistent with protecting public health and safety. The Oahe project office coordinates with Federal, State and local agencies and non-governmental organizations to develop, manage, and monitor resources at Fort Peck.

Public Law 109-320 (120 Stat. 1748), 11 October 2006, Salt Cedar and Russian Olive Control Demonstration Act. Requires the Secretary of the Interior to work with Secretary of Agriculture and Secretary of Defense to carry out a salt cedar and Russian olive

assessment program to assess the extent of salt cedar and Russian olive in the western United States, demonstrate strategic solutions for long-term management of salt cedar and Russian olive and assess economic means to dispose of salt cedar and Russian olive. The Corps coordinates with the multi-State and multiagency salt cedar task force to control salt cedar at Lake Oahe.

Executive Order 13423, 24 January 2007, Strengthening Federal Environmental, Energy, and Transportation Management. *In compliance*. This Executive Order requires Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. The Order sets goals in the areas of energy efficiency, acquisition, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, fleets, and water conservation. In addition, the order requires more widespread use of Environmental Management Systems (EMS) as the framework in which to manage and continually improve these sustainable practices. It is supplemented by implementing instructions, issued 29 March 2007, by the CEQ. The Oahe project has developed and implemented an EMS Plan.

Executive Order 13443, 17 Aug 2007, Facilitation of Hunting Heritage and Wildlife Conservation. *In compliance*. The purpose of this order is to direct Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat. Resource objectives and development needs for many management units at Oahe include providing and maintaining lake access for hunting and providing opportunities for hunting.

Cultural Resource Statutes

Public Law 59-209 (34 Stat. 225), 8 June 1906, The Antiquities Act. *In compliance*. This Act makes it a Federal offense to appropriate, excavate, injure, or destroy any antiquity, historic ruin, monument, or object of scientific interest located on lands owned or controlled by the United States without having permission from the Secretary of the department having jurisdiction thereof. Paleontological resources are regulated under this Act. The Corps is working to coordinate with all law enforcement agencies to establish a network of individuals that would be able to respond quickly to incidents of looting and artifact collecting.

Public Law 86-523 (74 Stat. 220), 27 June 1960, Reservoir Salvage Act, as amended. *In compliance*. This Act provides for: 1) the preservation of historical and archaeological data that might otherwise be lost or destroyed as the result of flooding or any alteration of the terrain caused as a result of any Federal reservoir construction projects; 2) coordination with the Secretary of the Interior whenever activities may cause loss of scientific,

prehistoric, or archaeological data; and 3) expenditure of funds for recovery, protection, and data preservation. This Act was amended by Public Law 93-291. Any construction proposed at the Oahe project connected to operation and maintenance of the facility is reviewed in advance by the Corps' Omaha District cultural resources staff. In all cases avoidance of historic properties is the preferred alternative. When such disturbance is unavoidable, suitable protection or data recovery will be implemented as required by the Act.

Public Law 89-665 (80 Stat. 915), 15 October 1966, National Historic Preservation Act (NHPA), as amended. *In compliance*. This Act establishes a policy of preserving, restoring, and maintaining cultural resources and requires that Federal agencies 1) take into account the effect of any undertaking on any site on or eligible for the National Register of Historic Places (NRHP); 2) afford the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on such undertaking; 3) nominate eligible properties to the NRHP; 4) exercise caution in the disposal and care of Federal property that might qualify for the NRHP; and 5) provide for the maintenance of federally owned sites on the NRHP. All ground-disturbing activities proposed on Oahe project lands are coordinated in advance with the State Historic Preservation Officer (SHPO), ACHP, THPO, and any other interested parties under Section 106 of the Act.

Executive Order 11593, 13 May 1971, Protection and Enhancement of the Cultural Environment. *In compliance*. Section 2 of this Executive Order outlines the responsibilities of Federal agencies in accordance with the National Environmental Policy Act of 1969, the National Historic Preservation Act of 1966, the Historic Sites Act of 1935, and the Antiquities Act of 1906. Section 3 outlines specific responsibilities of the Secretary of the Interior including review and comment upon Federal agency procedures submitted under this Order. The Oahe Cultural Resources Management Plan describes Corps procedures for inventorying, managing, and protecting cultural resources at the Oahe project.

Public Law 93-291 (88 Stat. 174), 24 May 1974, Preservation of Historical and Archeological Data. *In compliance*. This Act amends the Reservoir Salvage Act, Public Law 86-523, to provide for the preservation of historical and archaeological data (including relics and specimens), which might otherwise be lost as the result of the construction of a dam. Section 3(a) requires any Federal agency to notify the Secretary of the Interior in writing when the agency finds, or is notified in writing by an appropriate historical or archaeological authority, that its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistoric or archeological data. Section 7(a) requires any Federal agency responsible for construction project to assist/transfer to the Secretary of the Interior such funds as may be agreed upon, but not more than one percent of the total appropriated project costs. The costs of survey, recovery, analysis, and publication shall be considered non-reimbursable project costs. The Corps will notify the Secretary of the

Interior in writing if a Corps activity may destroy significant scientific, prehistoric, or archeological data.

Public Law 95-341 (92 Stat. 469), 11 August 1978, American Indian Religious Freedom Act (AIRFA) of 1978. *In compliance*. AIRFA protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. No proposals in the updated Master Plan would adversely affect the protections offered by this Act. Access to sacred sites by tribal members would be provided. A memorandum from the Corps' Northwestern Division dated June 7, 2004, Subject: Use of Corps Lands by Federally Recognized Tribal Members in the Northwestern Division provides guidance for access to Corps owned lands for tribal religious activities, including notification protocol and procedures.

Public Law 95-625. 10 November 1978. National Trails System Act. *In compliance.* Section 4(a) of this Act permits the Secretary of the Interior or the Secretary of Agriculture to designate national recreation trails. Section 5(a)(6) designates the 1804 and 1806 routes of the Lewis and Clark Expedition as a National Historic Trail. Administrative responsibility under this act has been assigned to the NPS. A section of the Lewis and Clark Historic Trail runs through the Oahe project.

Public Law 96-95 (93 Stat. 721), 31 October 1979, Archaeological Resources Protection Act (ARPA) of 1979. *In compliance*. This Act protects archaeological resources and sites that are on public and tribal lands, and fosters increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals. It also establishes requirements for issuance of permits by the Federal land managers to excavate or remove any archaeological resource located on public or Indian lands. All persons proposing to engage in archeological excavation on Oahe project lands are required to apply for and obtain an ARPA permit.

Public Law 101-601 (104 Stat. 3042), 16 November 1990, Native American Graves Protection and Repatriation Act (NAGPRA). *In compliance*. This Act provides for the protection of Native American and Native Hawaiian cultural items. It establishes a process for the authorized removal of human remains, funerary, sacred, and other objects of cultural patrimony from sites located on land owned or controlled by the Federal government. NAGPRA requires Federal agencies and federally assisted museums to return specified Native American cultural items to the federally recognized Indian tribes or Native Hawaiian groups with which they are associated. Notification of all inadvertent discoveries of such items covered by the Act are reported to the appropriate affiliated descendant or tribe in order of precedence as set by the Act. Any claims to such items are reviewed and the procedures to repatriate within the Act are followed.

Executive Order 12898, 11 February 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. *In compliance*. Federal agencies shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. Development and management activities proposed in the updated Master Plan are not anticipated to disproportionately impact minority or low-income populations.

Executive Order 13006, 21 May 1996, Locating Federal Facilities on Historic Properties. *In compliance.* This Executive Order requires Federal facilities, wherever operationally appropriate and economically prudent, to be located in historic properties and districts, especially those located in our central business areas. No activities under the Master Plan involve the development of Federal facilities that could be located in historic properties.

Executive Order 13007, 24 May 1996, Indian Sacred Sites. *In compliance*. This Executive Order requires that agencies avoid damage to Indian sacred sites on Federal land, and avoid blocking access to such sites for traditional religious practitioners. The Federal government gives tribes notice when an impact to a sacred site occurs. All ground-disturbing activities proposed on Fort Peck project lands will continue to be coordinated in advance with the tribes. In 2004, the Commander of the Northwestern Division issued a memorandum stating that the Corps should accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and would issue special use permits without charge, whenever allowable on Corps lands, to tribes and tribal members for ceremonial purposes. The memorandum also provides procedures that assist land managers with site protection as well as monitoring and investigation of any illegal activity regarding cultural resources.

Executive Order 13175, 6 November 2000, Consultation and Coordination with Indian Tribal Governments. *In compliance*. This Executive Order requires regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes. Section 3 establishes policymaking criteria when formulating and implementing policies that have tribal implications. Section 5 (a) says each agency shall have an accountable process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications. Tribal representatives were consulted with as part of the Oahe Master Plan and EA scoping and were provided copies of the Draft Master Plan and Draft EA for review.

Executive Order 13287, 3 March 2003, Preserve America. *In compliance*. This Executive Order encourages Federal agencies to recognize and manage the historic properties in their ownership as assets that can support department and agency missions although contributing to the vitality and economic well-being of the nation's communities. This Executive Order

also encourages Federal agencies to seek partnerships with State, tribal, and local governments and the private sector to make more efficient and informed use of their historic, prehistoric, and other cultural resources for economic development and other recognized public benefits. The Corps has consulted with State, tribal, and local governments to provide input on the effects of the Master Plan on cultural resources, including historic properties, and other public benefits.

APPENDIX D

Cultural Resources Definitions

Archaeological Interest - capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques such as controlled observations, contextual measurement, controlled collection, analysis, interpretation and explanation. This includes graves and human remains, which are also the subject matter of the Native American Graves Protection and Repatriation Act (NAGPRA); funerary objects, sacred objects, and objects of cultural patrimony covered by NAGPRA may be archaeological resources if at least 100 years of age and found in an archaeological context. An archaeological resource may be a historic property, or located within a historic property, as that term is used in the National Historic Preservation Act (NHPA) and the Programmatic Agreement. A site at which archaeological resources are located may also be an Indian sacred site as defined in Executive Order 13007.

Archeological Resource - any material remains of past human life or activities which are of archaeological interest," and that are at least 100 years of age, including graves and human remains if found in an archaeological context.

Consultation- the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the section 106 process. The Secretary's 'Standards and Guidelines for Federal Agency Preservation Programs pursuant to the National Historic Preservation Act' provide further guidance on consultation.

Cultural Resource(s) - A general "term of art" without specific legal definition used to refer to "all elements of the physical and social environment that are thought to have cultural value including historic properties, archaeological resources, sacred sites, religious sites, burial sites, properties of traditional religious and cultural importance, and Native American cultural items (including human remains, associated funerary objects, unassociated funerary objects, sacred objects, and objects of cultural patrimony).

Cultural Resource Management - activities and tasks involved in the stewardship of cultural resources, including to identify, evaluate, maintain, protect, and otherwise treat cultural resources, and to comply with historic preservation and environmental law

Cultural Resource Site - A cultural resource site is the location of a cultural resource. May be the location of a significant even, a prehistoric or historic occupation or activity, or a building or structure where the location itself maintains historical or archeological value.

Eligible for Inclusion in the National Register - includes both properties formally determined to be eligible in accordance with regulations of the Secretary of the Interior and all other properties that meet the National Register criteria.

Historic Property - any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria."

Indian Sacred Sites - any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or an Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion, provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

Traditional Cultural Property - a property that is "eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community."

Undertaking- a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out with federal financial assistance; those requiring a Federal permit, license, or approval.

APPENDIX E

Preliminary Final Master Plan Comments

(May 2010)

Comment	Response
General	
SRST is seeking legislation to authorize the return of all Lake Oahe project lands above elevation 1620 feet m.s.l.	Noted.
The legal name when referring to the Tribe is Standing Rock Sioux Tribe. When referring to the reservation, it is the Standing Rock Indian Reservation.	Concur. These changes have been made.
On page 2-98, the correct language is "Land that is held in trust by the United States for individual Indian landowners."	Concur. These changes have been made.
Water Rights	
When SRST fully exercises its water rights, it will have a major impact on Lake Oahe. It is important for the Corps to recognize and acknowledge SRST water rights in this master plan.	Because this is a land management document, a discussion of these impacts is then outside the scope of the master plan. However, the SRST water rights have not been quantified, so the potential impacts cannot be determined.
The master plan should include or reference another document that addresses the Corps emergency response plan for various types of threats to water quality and quantity of Lake Oahe.	Such a discussion is included in chapter 3 of this master plan under the section on high and low pool elevations.
Water Quality	
SRST believes that coordination and data sharing would benefit the efforts to keep the Lake Oahe reservoir at its highest quality. Three specific water quality reports were requested	Internet links to the requested reports were sent to Adrienne Swallow (SRST) in April 2010.
Water Supply	
Page 1-6 identifies only a few of the communities that obtain water from Lake Oahe. The master plan should list them all.	The list was never meant to be all inclusive. The wording in the paragraph has been changed to be more generic in nature.
Lake Oahe is a significant water supply for North Dakota. The master plan should in no way restrict or stop North Dakotans from utilizing this vital resource as a water supply now and into the future.	The Corps of Engineers does not approve requests for water withdrawal as it pertains to a consumptive use. However, the Corps does approve Section 10/404 permits, where applicable, for the installation of intakes and appurtenant structures. The Corps also issues a real estate license or easement to cover use of Federal lands.
The SRST wants to be notified in advance of adverse fluctuations of water levels in Lake Oahe. These can be defined as a federal undertaking and is subject to the NHPA under NEPA.	Meetings are held annually throughout the Missouri River basin to discuss potential water levels in the coming year. In addition, an Annual Operating Plan is published and available on line or by mail.

Sedimentation	
Although the Corps states that there is no evidence to prove that emergent contaminants exist in Lake Oahe, the Tribe requests evidence that they do not exist.	To date, there is no evidence of emerging contaminants which essentially establishes the fact that contaminants are not present.
Climate Change	
The SRST disagrees with the Corps' opinion that trends in climate change are outside the scope of the Master Plan.	This comment appears to address the water in the entire mainstem system. The Missouri River Master Water Control Manual does not consider the impacts of climate change, but is designed to allow service to all authorized purposes over a wide range of climatic conditions.
Ice Affected Flows	
It should be noted that under certain conditions during spring runoff and ice out, areas along Lake Oahe in south Bismarck and at General Sibley Park, Sibley Nature Trail and Apple Creek Wildlife Areas are affected by flooding.	Noted. A discussion of the ice affected flows in the Bismarck area has been added to chapter 2.
Vegetation	
A complete list of plant species should be included in the master plan.	Such a list is outside the scope of the master plan. A more complete list of plant species will be included in the Operational Management Plan which is currently under development.
Would recommend the use of soil bioengineering for any bank stabilization.	Such a recommendation is outside the scope of the master plan. Specific bank stablization procedures must be decided on a case by case basis that would take into account soil type, slope, fetch, and other factors.
Fish and Wildlife	
A list of water birds should be included. Nesting areas should be listed and be identified as off limits.	Waterfowl and other water dependent birds are addressed in chapter 2. To list nesting sites for these birds is outside the scope of this master plan. This is an issue that will be further addressed in the Operational Management Plan.
Cultural Resources	
SRST objects to the sentence, "The depletion of forage, timber, and game and the gold discoveries in Montana and the Black Hills put pressure on the Indians."	Concur. This sentenance has been deleted.
Rare and Endangered Species	
Page 2-49 should note that North Dakota also has a Natural Heritage Inventory Program that contains a list of sensitive species.	Noted. This has been added to the writeup.
Specific management activities/plans for those units that have historically been used by terns/plovers should be included in the master plan.	Specific management activities are outside the scope of the master plan. Specific management of individual units will be addressed in the Operational Management Plan.
Population	

The master plan incorrectly describes the population demographics of the Standing Rock Indian Reservation and claims that the poulation is decreasing because of outmigration. This is the opposite of what is occuring. The 2010 Census data should be used.	The 2010 Census figures will not be available until at least April 2011. The statement in question has been deleted.
Real Estate	
Under the section "Land Holdings" the correct wording for bullet #3 should be "Land that is held in trust by the United States for individual Indian landowners."	Concur. This change has been made.
Resource Plan	
There are discussion about an OHV trail that would connect to the OHV trail in MU #58. This should be included in the master plan.	Concur. This has been added to the management unit writeup.
In the discussion in MU#72, the correct Lakota or Sioux words for Standing Rock are Inyan Woslata.	Concur. This change has been made.
MU #80 should state that development activities be conducted outside of breeding/nesting period for terns and plovers and the any proposed visitor use facilities be constructed away from tern and plover areas.	Concur. This has been added to the management unit writeup.
MU #97 should state that sediment removal should be scheduled to limit the impacts on terns and plovers.	Concur. This has been added to the management unit writeup.

Draft Master Plan Public Comments

(June 2009)

Comment	Response
General	
Pg 6-1 identifies 3 segments to the Oahe Project but only describes 2 of them.	There are 3 segments identified…the dam to just south of Mobridge, SD; north of the SD/ND State Line; and the transition area between the two.
Project Purposes	
How can you say that agriculture and grazing is not a project purpose? Ag is important in all of North Dakota.	Although agricultural lands adjacent to the Oahe project are important, they are not an project purpose as designated by Congress. The congressionally authorized project purposes are hydropower, flood control, navigation, fish and wildlife management, recreation, water supply, water quality, and irrigation.
The master plan does not do enough to address adjacent land use.	The master plan provides a discussion of the development and management of only Corps-owned project lands. The Corps has no authority over non-Corps lands. The master plan is not meant as a discussion of all adjacent land use.
Can the ranchers set up a land trade? Ranchers can take over the shoreline areas and give the Corps lands that are more beneficial to wildlife.	the Corps lacks authority for a trade. By law, the shoreline is open for public use. The Corps requires the lands for slumpage, slippage, and erosion by the lake.
Land Classifications	
Agriculture is an important economic factor and resource in the northern Lake Oahe area. Recommend that the Corps Land Classifications used be changed to include agriculture and grazing.	The land classifications used in the master plan were established by Corps headquarters in EP 1130-2-550 (Nov. 1996) and are used nationwide.
Lake Elevations	
Need to release water for navigation only when and if there is barge traffic on the lower reaches of the river.	This issue is outside the scope of the master plan. It is addressed in the Corps of Engineers Missouri River Master Water Control Manual.
Page 2-121, Lake Operation - Need to add the following: "April through May lake level draw downs have harmful effects on prey (i.e. rainbow smelt, emerald shiner, spottail shiner, and yellow perch) and predator fish (i.e. walleye and northern pike) egg incubation and hatching."	This issue is outside the scope of the master plan. It is addressed in the Corps of Engineers Missouri River Master Water Control Manual.
Title VI	
How has Title VI worked? Has it benefitted the Corps?	The Corps has no opinion on this issue. It is outside the scope of this master plan.
How is the campground management handled under Title VI?	The campgrounds in South Dakota were transferred in fee title. The State manages these areas the same as all other State campgrounds. However, transferred areas that were previously leased areas are also managed according to the terms of the lease.

Would we be better off if North Dakota was to manage the campgrounds?	The Corps has no opinion on this issue. The people of North Dakota have to determine the benefits on their own.
Would the Corps consider giving North Dakota the money to manage the recreation areas?	Title VI was a specific statutory authority relevant only to South Dakota.
Water Rights	
When the Standing Rock Sioux Tribe fully exercises its water rights, it will have a major impact on Lake Oahe. The Corps should recognize and acknowledge the Tribe's water rights.	Tribal water rights have not been quantified; therefore, the potential impacts cannot be determined. As a result, impacts cannot be incorporated into this master plan for land management.
Water Quality	
CRST believes that coordination and data sharing would benefit the efforts to keep the Lake Oahe reservoir at its highest quality.	Noted. No response required.
The master plan should reference other documents that address the Corps emergency response plan for threats to water quality and quantity.	Such a document, to the extent that it addresses water quality and quantity, is included in chapter 3 of this master plan.
The long life span of the master plan should dictate the inclusion of weather trends, particularly when they indicate a decrease in overall water quantities.	Noted. See response to this comment in the Preliminary Draft comments. There are no known studies addressing water quantity at fluctuating lake elevations.
Sedimentation	
Although the Corps states that there is no evidence to prove that emergent contaminants exist in Lake Oahe, the Tribe would prefer evidence that they do not exist.	This issue is outside the scope of the master plan. This master plan is a document for land management. It is not an overview for water quality studies.
Access	
There is a need to increase the shoreline access in each recreation area - both walking and driving.	Concur. These are identified in the master plan as development needs where appropriate.
Needs to be universal access for shoreline fishing for kids and elderly at Hazelton boat ramp.	Concur. This will be identified as a development need within the resource writeup in chapter 6,
Can fishing piers be installed at the northern recreation areas?	Normally, piers are constructed downstream from dams not on the lake where they would be susceptible to major water fluctuations. However, there may be other options for shoreline access that can be researched.
Where are all of the public access areas that are not in recreation areas? Is there a map available or how can the public find out where these areas are located?	There are recreation maps for Lake Oahe that identify public access points. Note that the Oahe project shoreline is open to walking access from section lines or other public roads.
Increased boat traffic into Cattail Bay is ruining the gravel road. It is easily rutted even after it has been bladed. Can the Corps pave the last mile into Cattail Bay?	This issue is addressed as a development need within the Cattail Bay resource plan writeup.
How do I gain access to Corps lands that are outside of designated recreation areas?	The Oahe project shoreline is open to walking access from section lines or other public roads.

Is there public access across Corps property with the consent of the leaseholder?	Every lease has a requirement to allow public access over the land. The leased premises are open to the general public for hunting, fishing, and related recreation activities unless prohibited by the Lake Manager. Posting of the lease premises by the lessee with "No Trespass," No Hunting," "Private Property," or similar signs is prohibited.
Recreation Facilities	
Need fish grinders at Hazelton, Beaver Bay and Langelier Bay. Storing fish remains at the top of the hill is not working.	Concur. There is a need for running water to operate fish grinders. Water lines would need to be installed and connections made to the rural water system. This has been included as a development need where appropriate.
The casino traffic is taking up valuable boat trailer parking at Beaver Creek.	Concur. Monitoring needs to increase and signs will be installed directing casino traffic to park away from the boat trailer area. Additional docking and parking will be required to address that issue until a proposed bridge is constructed.
The casino shuttle blocks the ramp at Beaver Creek. The shuttle always pulls in the middle of the ramp and takes up 2 lanes. Can the shuttle be made to use one of the end lanes in order to free up the rest of the ramp for boaters?	Concur. Prairie Knights Casino will be contacted and a new plan for the casino shuttle will be developed.
Can the recreation areas just be Pack In/Pack Out? It would save money on waste management contracts.	We do have areas that are Pack In/Pack Out. However, this program is only marginally successful.
What is the plan for the Hazelton boat ramp and recreation area?	There is a need to develop a comprehensive site plan. A comprehensive plan would take into account changes in recreation use as well as camping and boating equipment.
At McLean Bottom, why did FWS close the road for wildlife?	Although owned by the Corps, NDGF leases this area as part of their Oahe Game Management Area. It is authorized under the lease for the benefit of wildlife.
We need to keep boat ramps functional and levels in the reservoir high enough that State monies aren't needed to extend ramps again.	Boat ramps are maintained to the extent budgets allow. Reservoir elevations are outside the scope of this master plan.
Noxious Weeds	
Why is it that North Dakota, specifically Emmons County, seems to be on the bottom of noxious weed control?	Corps money for noxious weed control is equally spread among all counties that are participants in the Lake Oahe Weed Task Force. Emmons County has received all funds requested. No county has been given preferential treatment.
Noxious weeds are present at Horsehead Bay, primarily Canada thistle. How can the Corps expect farmers to control noxious weeds when the Corps doesn't.	The State, not the Corps, regulates noxious weeds on private property. The Corps has an integrated noxious weed management program on project lands, but the program is subject to available funding.
How can the Corps expect lessees to control noxious weeds on the same land that the Corps considers inaccessible.	No land is considered inaccessible for weed control. The unit may be more economical for plane or biocontrol than hand spraying.

Need a more aggressive weed management plan from the Corps.	The Corps does have an integrated pest management program on project lands. The Corps controls as much as they can with available funding.
Funding allocated by the Corps for noxious weed spraying is often too late to do the best job.	Agree. In recent years, the annual Corps budgets have been passed by Congress as much as 6 months after the start of the year. We cannot commit to spending prior to the receipt of the annual budge allocation.
Emmons County area has a vast noxious weed problem that start at the north end of Lake Oahe and are carried south by the wind and water.	Every management unit in Emmons County has recognized the need to control noxious weeds.
One solution in controlling noxious weeds would be to allow grazing on May 1st of each year.	Grazing systems that support the project purposes and address start dates for control of noxious weed will be worked for each management unit. The OMP further will address specific unit recommendations for the grazing system and control of noxious weeds.
Seek additional funding and/or reprioritize funding, especially when water levels are low, for the control of noxious weeds.	The Corps has developed the high/low plan (chapter 3). The OMP will address giving earlier alerts for areas of issues like noxious weeds.
Regularly map treated and untreated infestations of noxious weeds and prioritize accordingly.	Both the North Dakota and South Dakota Departments of Agriculture are the clearing houses for the mapping of data collected by the weed boards, Tribes, or agencies that participate in spraying or documenting weed infestations on the Oahe project.
Place noxious weed control higher on the Corps priority list and categorize it as an authorized project to not only protect critical habitat but to stop the spread of invasive species onto other lands.	Each master plan management unit addresses noxious weed control as a resource objective and development need.
Implement an early grazing season - at least in or near weed-infested areas - as a management tool to further control noxious weeds.	Grazing is just one tool in the control of noxious weeds but studies have shown that grazing can also increase noxious weeds in some areas. Grazing proposals that follow guidelines that benefit the control of noxious weeds and leave enough biomass in the area for use by wildlife and fish species may be accepted.
Recognize studies that have shown that livestock grazing does not significantly impact least tern and piping plover nests. A July 15th grazing restriction on noxious weed infested lands will only allow weed infestations to increased.	The July 15 date for grazing is not connected to either of the two endangered species but rather a condition of overutilization which leads to overgrazing of the pastures.
Work with local lessees to develop an acceptable grazing plan.	Such a request was sent out to all grazing lessees on Lake Oahe in January 2009.
the Corps needs to enforce lease requirements with regard to weed control and provide guidance and incentives to lessees to manage noxious weeds on project lands.	The Corps is enforcing these requirements to the extent that it can.

Implement an integrated pest management program for the control of noxious weeds and utilize such methods as biological control and aerial spraying in areas considered inaccessible by land.	An integrated pest management program of biocontrols, spraying, and mechanical methods, along with a coordinated team effort (lessee, county weed officer, Tribe, State agency, and the Corps) already exists. Aerial applications for large areas of infestations have occurred in Potter County (2006/07) and Corson and Campbell Counties (2008).
Grazing	
Ranchers can't maintain fencing to the shore. It is expensive and there are other priorities.	This issue is outside the scope of the master plan.
How can you alter dates for grazing from one county to another? (Emmons County vs. Sioux County)	The grazing in Sioux County is managed by the Bureau of Indian Affairs. BIA has its own grazing system dates and AUMS enforced by the Tribe.
The restrictions on grazing make land management difficult for land owners adjacent to project lands.	Grazing is just one tool in the control of noxious weeds but studies have shown that grazing can also increase noxious weeds in some areas. Grazing proposals that follow guidelines that benefit the control of noxious weeds and leave enough biomass in the area for use by wildlife and fish species may be accepted.
Disagree that overgrazing is the cause of erosion. If producers are not allowed to graze early, how would they be responsible for erosion?	Erosion is not a condition of grazing dates but more a condition of overutilization which leads to overgrazing of the pastures.
Wildlife	
If the Corps did nothing, would it change the amount of wildlife in Emmons County?	Historically, the Missouri River region has always been used as a wildlife corridor. There is no information quantifying the affect of the Corps efforts.
What is the Equitable Compensation Act and how does that affect adjacent landowners?	The Three Affiliated Tribes and Standing Rock Sioux Tribal Equitable Compensation Act of 1991 (§3501 of P.L. 102-575) was passed to compensate the Three Affiliated Tribes and the Standing Rock Sioux Tribes for the taking reservation lands at the Garrison and Oahe Dams and Reservoirs. Originally, the act also provided for the transfer to the Tribes of certain Corps project lands, but that provision was repealed by §407 of P.L. 103-211, passed February 12, 1994. The Corps has no knowledge of any affect on adjacent landowners.
Kochia and Russian thistle is referred to a good habitat for pheasant and deer. However, when this growth gets old, wildlife retreat to farmland adjacent to the Corps land. If it weren't for the farmers adjacent to Corps land, the wildlife would often times not make it through the winter.	Everyone is considered stewards of our nation's wildlife. Old growth provides good escape cover year round.
Fisheries	
On page 2-7, replace the word "fishery" with the word "fish" in the last sentence of the second paragraph.	Concur. Change has been made.
Contact NDGF to update Table 2-13	The table is current.

Does CRST actually stock walleye in Lake Oahe? They did in the 1990's but are they still stocking?	The stocking program was discontinued in the early 1990's. The only stocking done at the present time is for stock dams on the reservation.
What is the status of the Beaver Bay impoundment?	The Beaver Bay impoundment is on hold pending a study by the North Dakota State Water Commission.
Recreational fishing and boating have a huge economic impact in South Dakota. This needs to be highlighted.	Noted.
Lake Oahe levels needs to be stable or rise during the spring spawn. We can not afford to miss a spawn in forage species.	This issue is outside the scope of this master plan. The issue is addressed in the Missouri River Master Water Control Manual.
Page 6-46, Need to update 2nd paragraph under Area Use to reflect current spawning station and fish ladder use.	Concur. These changes have been incorporated.
Endangered Species	
The new grazing restrictions seems to forget about the endangered birds who originally were the cause of the July 15 deadline.	The grazing dates in question were not connected to the endangered species but more a condition of overutilization which leads to overgrazing of the pastures.
Population	
The population of the reservation is increasing with a lower than average median age. This is contrary to what is stated in the master plan.	Nationwide, the master plans always reflect the latest census figures. In this case, they are from the 2000 census.
Cultural Resources	
Why is there a problem picking up arrowheads? There are plenty everywhere.	The Corps has an obligation to protect and manage all Federal resources for the benefit of the public. Arrowheads are a public resource and it is against the law to remove them from Federal property.
The Corps must consult with the Tribal Historic Preservation Office or the NEPA Coordinator prior to any action that may adversely affect historic, cultural and religious sites on the Standing Rock Indian Reservation.	The Corps meets all of its obligations under applicable cultural resource laws and regulations.
Visitation	
On page 2-88, paragraph 3 - Add a statement saying that the lower lake levels during the drought exacerbated the decline in prey fish abundance causing a downturn in the condition and abundance of sport fish, primarily walleye, in Lake Oahe	During the drought, the abundance of sport fish was affected for a number of reasons - one of which was a decrease in prey fish.
Page 2-88, paragraph 3 - Delete last sentence of 2nd paragraph. It suggests that the decreases in visitation from 2001 to 2002 were related to the transfer of recreation areas to the SDGF&P and CRST.	This sentence has been reworded. The drop in visitation during those years is because visitation for non-Corps-owned areas is not reported.

Preliminary Draft Master Plan Comments

(March 2008)

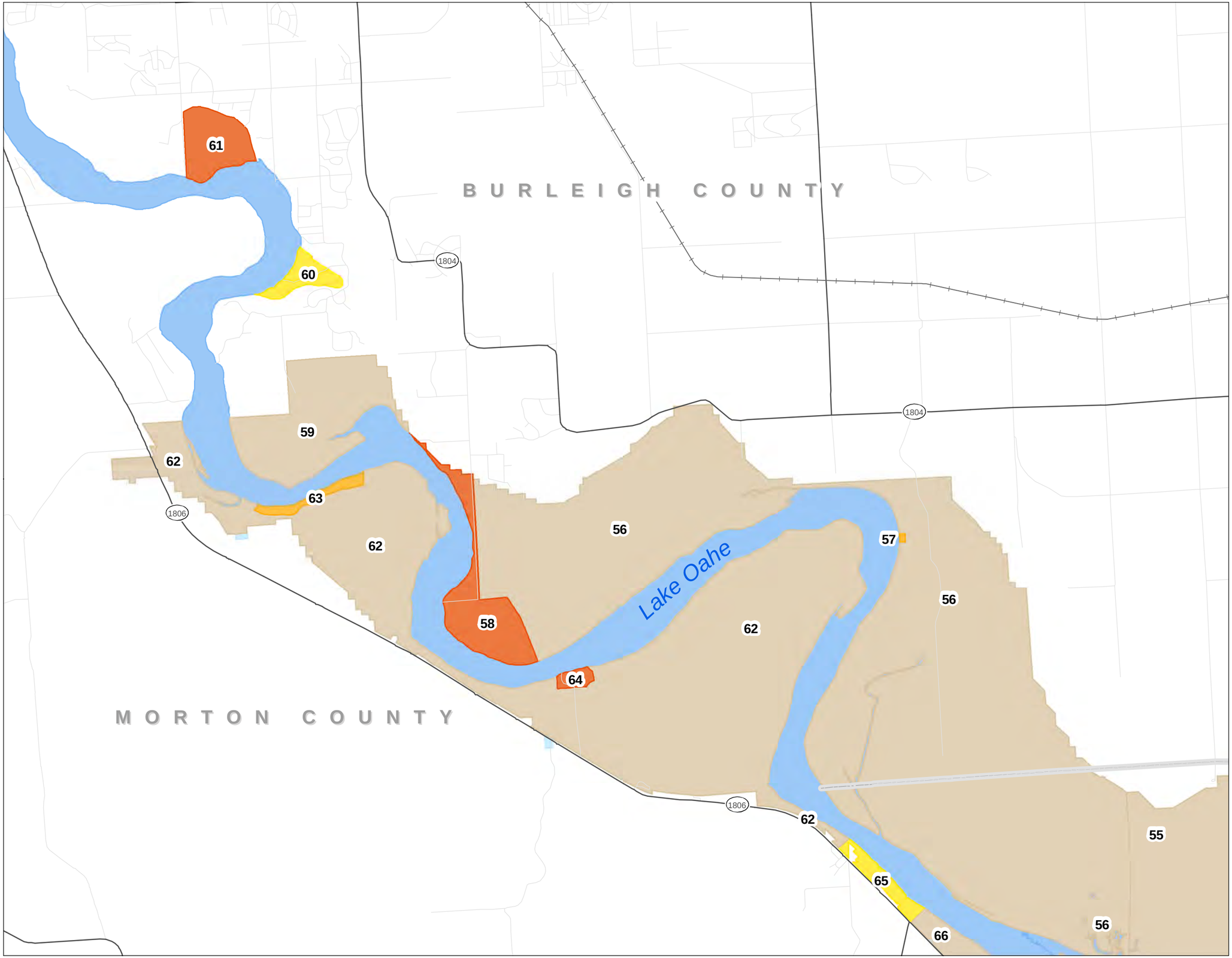
Comments	Responses
Project Purposes	
- The SRST would like to be a partner with the Corps in managing the resources of Lake Oahe and the taken area lands.	All the developed recreation areas within the reservation (Grand River, Indian Memorial campground, Indian Memorial north ramp, Fort Yates ramp and parks, and Walker Bottom) are outgranted for operation and management to the SRST. For over 10 years the Oahe Project has had a stewardship contract awarded to the tribe for managment of lands outside the above areas. We will look for more opportunities for the tribe to participate in the management of lands. Finally, Public law 85-915 allows the tribe to graze the majority of the project lands within the reservation. This grazing program is administered by BIA for the tribe.
- Revise the purpose and the operation of Lake Oahe from re-regulating the reservoir to meet present and future water needs	Outside the scope of this master plan. The Main Stem Reservoir System is regulated in accordance with the Master Manual to meet the congressionally authorized project purposes. The Master Manual was revised in 2004 and 2006. Nor further revisions are planned at this time.
- Address the process the Corps will use to revise the Flood Control Act of 1944 recently authorized by Congress	If Congress authorizes and funds a study to reexamine the authorized project purposes of the Main Stem Reservoir System, the Corps will conduct the study and make any necessary changes to the Master Manual at that time.
Water Rights	
- SRST asserts primary water rights to the Missouri River regardless of whether or not it has quantified its water usage.	This issue is outside the scope of this master plan.
- SRST asserts the authority to administer rights to the use of the Missouri River water within the exterior boundaries of the Standing Rock Indian Reservation.	This issue is outside the scope of this master plan.
Purpose and Scope of MP	
- SRST would like to have the taken area lands returned so that the Tribe can manage them. What steps must be taken to make this happen?	This issue is outside the scope of the master plan. The Corps has no authority to transfer land to the SRST. However, if there is Corps land found to be excess to project purposes, it would be transferred to GSA for disposal. Pursuant to PL 93-599, excess lands within a reservation boundary shall be held in trust for the benefit of the tribe. Currently, there are no excess project lands.

Description of the Reservoir	
- What steps is the Corps going to take to restore the cottonwood forest ecosystem?	The Corps is currently developing a cottonwood management plan, which is expected to be finished in 2010. The goal of the plan is to be a living document that preserves, creates, or enhances cottonwood habitat along the Missouri River.
- Define the impacts of Lake Oahe reaching the end of its lifespan.	Over time, Oahe reservoir will fill with sediment, which will gradually reduce service to the authorized project purposes. With an estimated annual sediment inflow of 19,800 acre-feet per year, the remaining project life is 1,170 years.
Reservoir Regulation	
- SRST would like the Corps to further define its trust responsibility to Indian trust resources including all water intakes used within the boundaries of the reservation.	The Corps does not have general authority to build or maintain Tribal water intakes on Oahe reservoir. The Corps acknowledges the Tribes' reserved water rights. In no way does the Master Manual or Annual Operating Plan attempt to define, regulate or quantify water rights or any other rights the Tribes are entitled to by law/treaty.
Sedimentation	
- Are the sediments that are being disturbed by unnatural river flow contaminated and are they being sampled and tested for emerging contaminants? If not, when does the Corps plan to start such testing?	There is no evidence to indicate that these contaminants exist at the portion of Lake Oahe near the SRST. North Dakota has issued a state-wide fish consumption advisory for mercury but it is not specific for one region. Normally, contaminants are tested when there are either historic upstream conditions that warrant such actions (e.g., mining operations, etc.) or if there is a fish tissue study data to indicate possible contamination. A study of sediment contamination is to be completed in the Cheyenne River. Furthermore, appropriate remedial action to eliminate any public health and environmental risk posed by the contaminated risk is to be taken. Work is to be completed per the legislation by 2010.
Water Quality	
- Need to determine the impacts of climate change on availability of water in the Missouri River	This issue is outside the scope of this master plan. The master plan deals with the land resource only. Water resources are addressed in the Corps Master Water Control Manual. The Corps and other Federal agencies have begun studying the impacts of climate change. When more specific information becomes available from the on-going climate change studies, the Corps may use the information to determine what long-range impacts can be expected as a results of climate change.

Shoreline Erosion	
- Need to address the erosion that is taking place within the taken area boundaries into tribal and allotted lands within the reservation boundaries.	To protect the entire Oahe shoreline is cost prohibitive. The Corps has constructed projects at site specific locations to provide erosion protection for features such as infrastructure and cultural resources. The Corps has established rangelines that were set up following dam construction to monitor shoreline erosion, aggradation, and degradation. These rangelines have been periodically surveyed since dam construction following a determined schedule and as funding permits. The Corps recognizes an obligation to compensate private landowners for erosion or flood damage that occurs due to the operation of the federally constructed project.
Accessibility	
- SRST is interested in having a bridge built across the Missouri River along the Walker Bottom area.	The Corps currently lacks any authority related to the bridge.
Fisheries	
- Effect of plywood gates installed on the water intakes at Garrison Dam on the downstream fisheries	Monitoring of the temperature of water discharge through Garrison Dam during the summers of 2003-2007 indicated that installation of the plywood barriers in 2005 raised the temperature of the water passed through Garrison Dam, on average, about 2°C in the summer. Recent monitoring of water temperatures in the Missouri River downstream from Garrison Dam has indicated that the effect of warmer summer discharges is dissipated by the time flows reach the Bismarck, North Dakota area. NDGF has postulated the warming of the Missouri River downstream of Garrison Dam benefits the warmwater fishery of the river.
Cultural Resources	
- Corps has trust responsibilities because of the treaty rights of the federally recognized tribes.	The Corps cultural resources responsibilities are dictated by applicable laws and regulations.
- The Corps frequently confuses consultation with elected tribal leadership with consultation with the THPO and vice versa. These processes need to be kept separate.	Concur. The Corps is willing to work with the tribes on refining the process.
- The SRST did not sign the PA. The Corps acts in its mailings as if the SRST is a signatory Tribe and is governed by the PA. The document should state that the Corps will consult with the SRST separately from the PA consultations.	The SRST is included in the PA process as a nonsignatory tribe.

- The non-signatory status of the SRST should be acknowledged in the section on Cooperative Agreements in Chapter 2. This section should include a tabulation of those tribes and THPOs that did not sign the PA and a statement that the straight NHPA rather than the PA applies in these instances.	No objection to doing so. However, it should be noted that the NHPA process is essentially the same for PA and non-PA parties.
- The statement that the PA process has ensured compliance with cultural resource laws is factually in error. The Corps has not evaluated a single site on the Standing Rock Reservation in the four years following issuance of the Cultural Resources Management Plan.	The PA has not ensured that cultural compliance is COMPLETED for everything, forever. It is ongoing, and the PA ensures that the process is consistent for the main stem projects.
- The Corps in its operation of Lake Oahe has destroyed more significant cultural resources than all those affected by agricultural leases, recreational development, and vandalism combined. The Corps must address its own behavior. There has been a systemic failure to protect sites from shoreline erosion or to modify operations of the reservoir so that these sites are not destroyed.	The Corps cultural resources responsibilities are dictated by applicable laws and regulations. The PA was developed to address some of these very issues. (See each year's annual report for current and past activities).
- The Corps Omaha District has one officer assigned to protect all of the sites on the reservoirs under its jurisdiction from looting and vandalism. The Corps' actions demonstrate the low priority actually given to providing protection.	The Corps cultural resources responsibilities are dictated by applicable laws and regulations.
Current Population Trends	
- The population on the SRST reservation is growing faster than the normal rate and there is a growing younger population on the Reservation. Therefore, the tribes' water usage will increase over time. Although there is outmigration on the Reservation, it is not a significant enough of a factor to limit the growing population trend.	The master plan deals with the current demographics only. Water usage is outside the scope of this master plan.
Current Landholdings	
- The correct language should be "land that is held in trust by the United States for the benefit of Indian tribes.	Concur. The correction has been made.
Management Plans	
- The Operational Management Plan (1989) and the Shoreline Management Plan (1977) need to be updated.	Concur. Updates of these documents are tentatively scheduled to begin after the completion of this master plan. However, this effort is subject to future appropriations.

Interpretation	
- The Lakota/Dakota history should be included in any interpretive program at the Oahe project	Details for the Outreach and Interpretive program at Oahe Project are not address in this planning document. It can be further address in the Outreach and Interpretive Program plans tentatively scheduled for future development after completion of this plan..
Tribal Jurisdiction	
- This section of Chapter 3 needs to be updated to include the latest tribal jurisdiction issues and cases.	Tribal jurisdiction is not currently an issue in the Corps' operation of the project. If it becomes an issue, the outcome will be determined by the relevant case law at that time.
Noxious Weeds	
- Need to define the nature of partnership with the Tribes on noxious weeds.	Oahe project will continue working with partners within the tribal government, BIA, and local governments to control or suppress noxious weeds on all Corps land.
High Pool and Low Pool Operating Conditions	
- As part of the AOP, the Corps should provide a list of cultural sites that will be impacted at the projected pool levels, as it has done with recreation sites.	This issue is outside of this master plan and has been forwarded to district archeologists for follow-up.
Municipal Intakes	
- The tribes need more clarification as to what type of technical assistance could be offered if issues arise concerning water intakes.	Planning Assistance to States and Tribes (PAST) is a study authority. It is a 50% Federal, 50% non-Federal cost share agreement. The tribes would need to help define their goal, approve the scope and budget and provide either cash or in-kind labor for their portion of the cost share. Unfortunately, PAST does not enable the Corps to step in during an emergency situation and render assistance. Additional information about the PAST program has been sent to SRST.
- An emergency plan needs to be created with more options than trucking water into the Reservations.	PL 84-99 allows for the emergency transport of water into an area. There are no provisions to supply a continuous non-emergency water supply under this public law.
Recreation Development	
- SRST is interested in development of recreational areas within the Reservation. What steps are necessary to make this happen?	Chapter 6 has identified potential future recreation areas on both the SRST and the CRST Reservations. At this time, these areas are not slated for development by the Corps because of budgetary constraints. However, they are available for lease and development by others after the potential lessee completes a marketing study, feasibility study, NEPA and environmental compliance documentation, and real estate documents are executed and the proposed development has been approved by the District Engineer.



Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 23 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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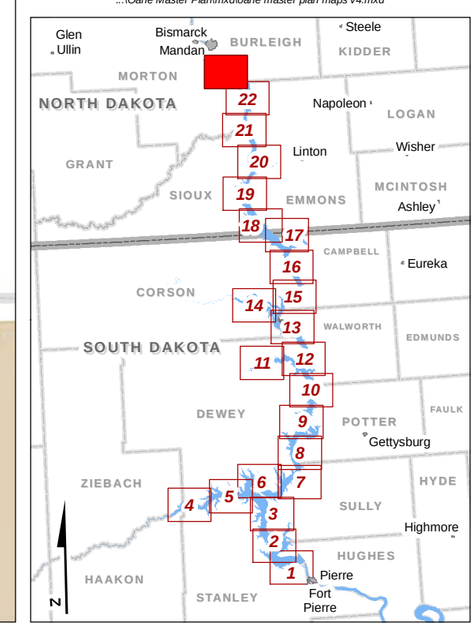

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

EMMONS COUNTY

MORTON COUNTY

Lake Oahe

Rice Creek

Badger Creek

62 65 66 56 55 66 55 55 66 55 54 66 67 53 52 68 52

1804 1806 1804 34

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
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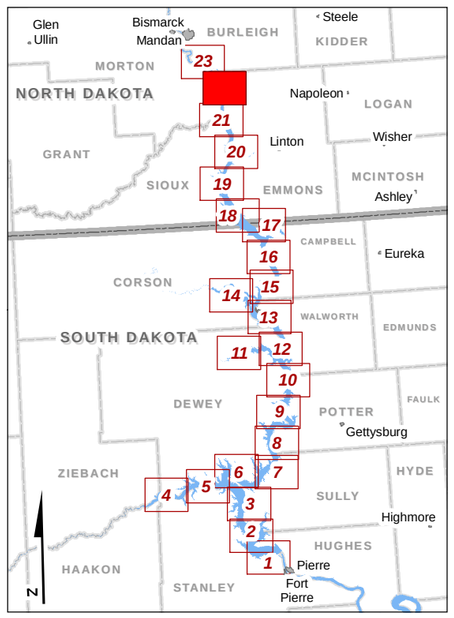

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 21 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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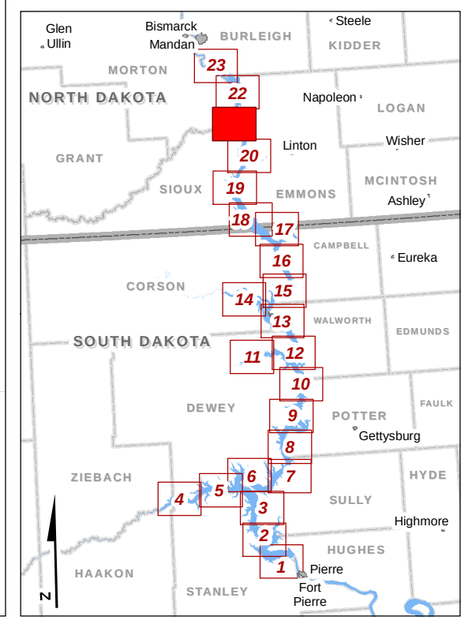

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

SIOUX COUNTY

EMMONS COUNTY

STANDING ROCK SIOUX RESERVATION

Lake Oahe

Beaver Creek

Beaver Holes Creek

Fool Bear Creek

Bone Creek

Little Beaver Creek

69 52 70 51 50 49 48 71 1804 24 13

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 20 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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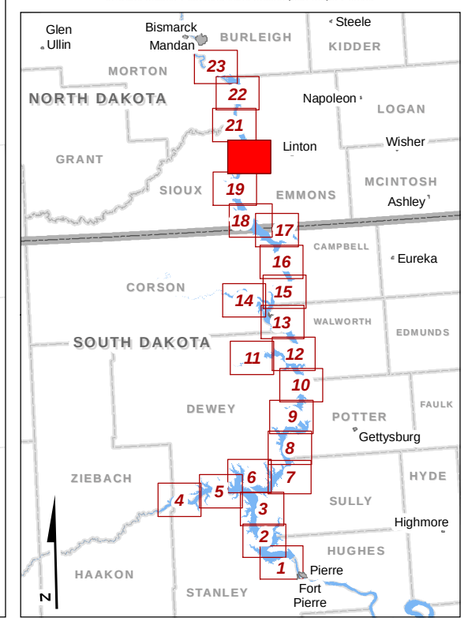

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

STANDING ROCK SIOUX RESERVATION

SIOUX COUNTY

EMMONS COUNTY

Lake Oahe

Battle Creek

Porcupine Creek

Sitting Bull Bay

Cattail Bay

71 48 24 1804 47 72 74 73 75 76 45 46

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 19 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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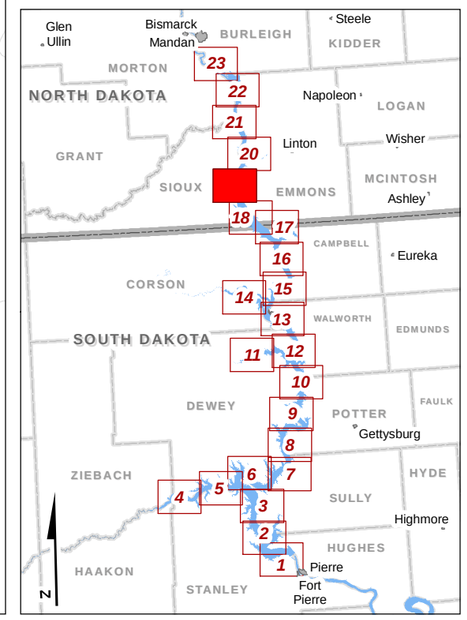


Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

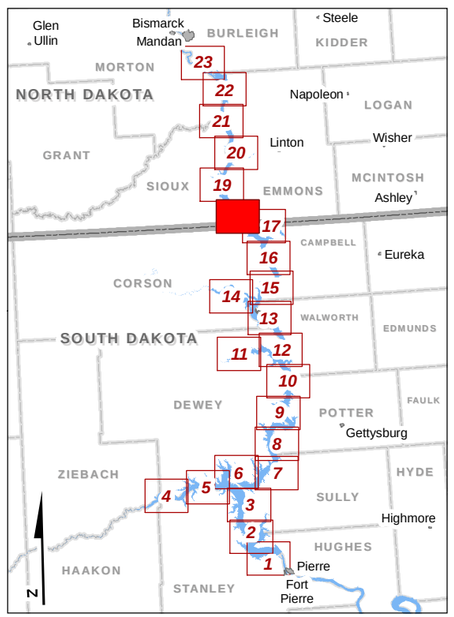
- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 18 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
...\Oahe Master Plan\mxd\oahe master plan maps v4.mxd



Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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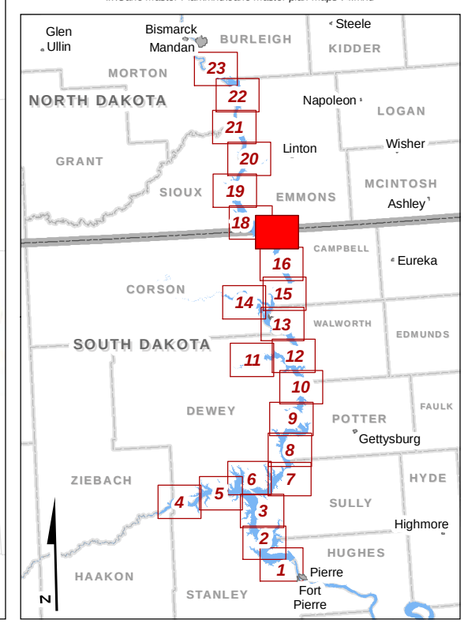
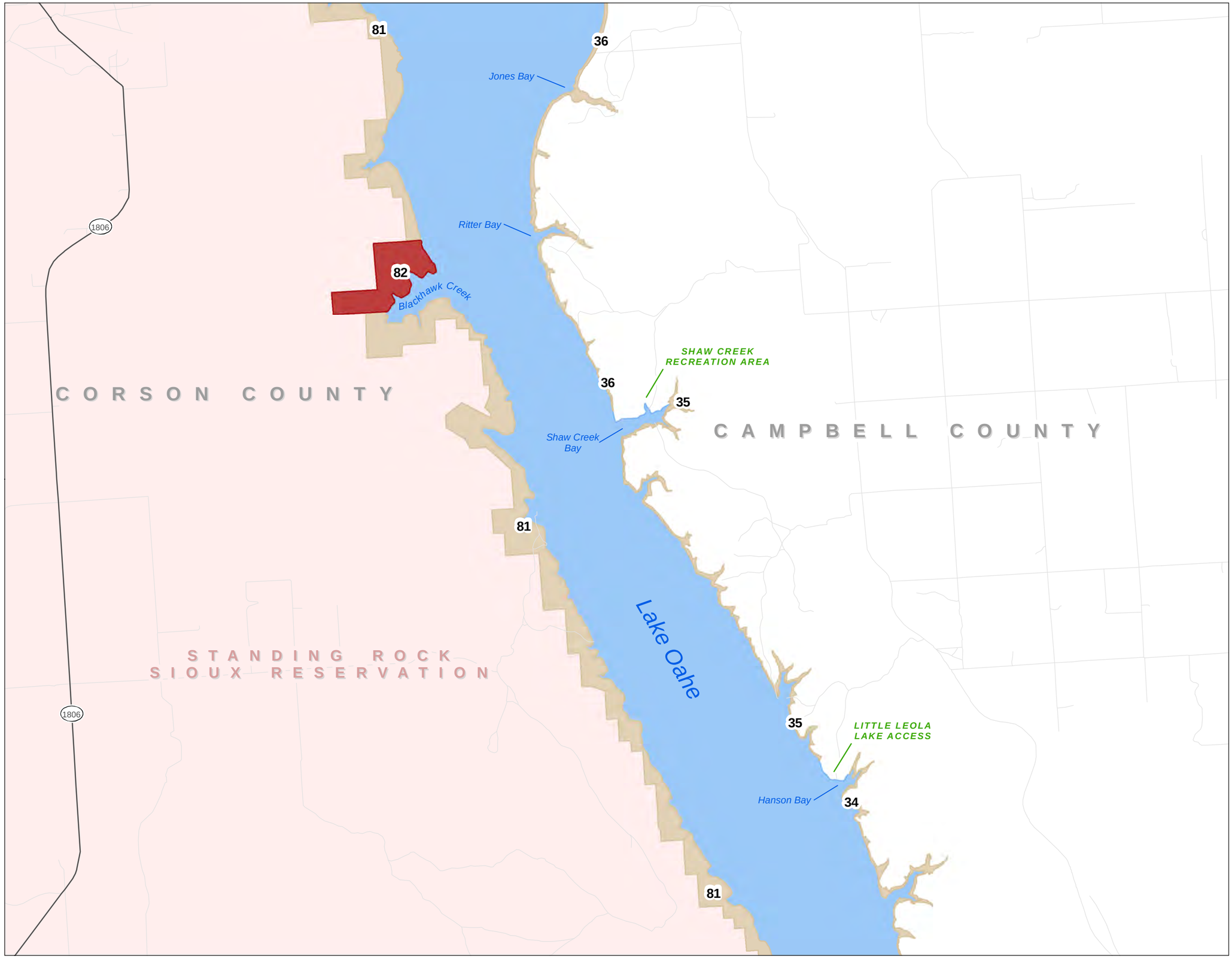


Master Plan

Oahe Project / Lake Oahe

Current Land Classification



Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 16 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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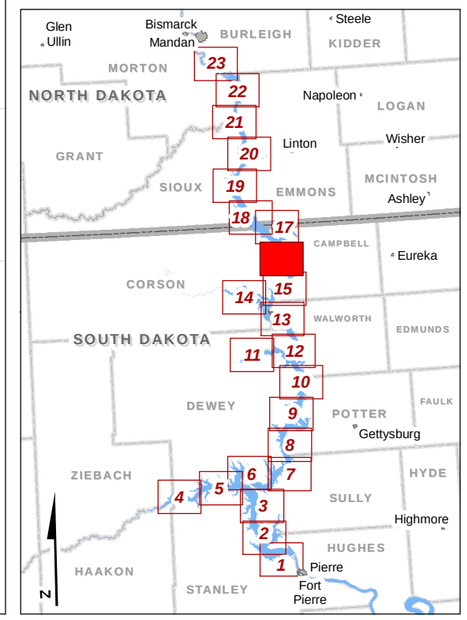

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

CORSON COUNTY

STANDING ROCK SIOUX RESERVATION

CAMPBELL COUNTY

WALWORTH COUNTY

Lake Oahe

Locke Creek

Mad Bear Creek

Leavenworth Creek

Galaway Bay

Cuthead Creek

Oak Creek

81

34

32

33

83

1804

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 15 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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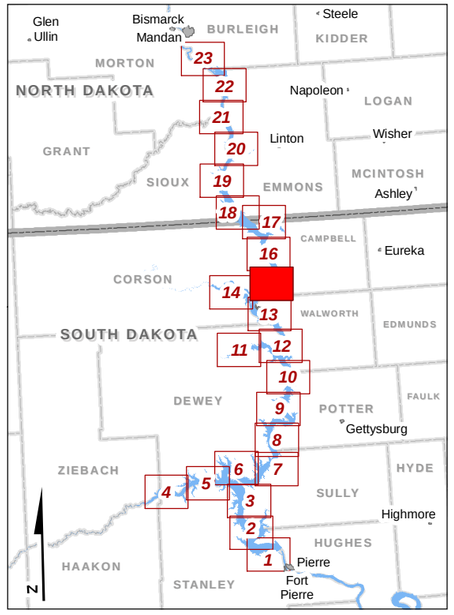

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 14 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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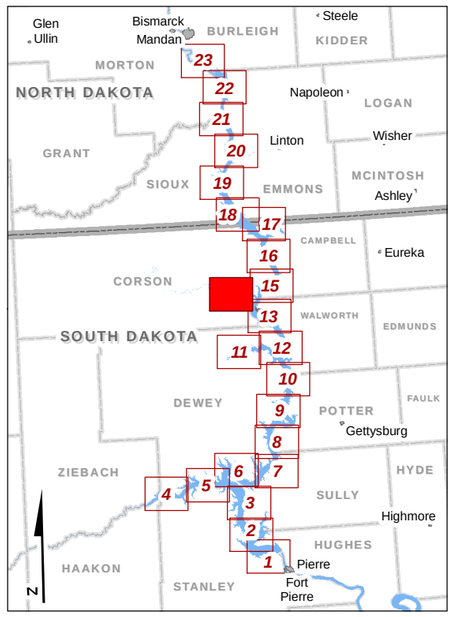

STANDING ROCK SIOUX RESERVATION

CORSON COUNTY

Grand River

Wakpala

High Bank Creek

Snake Creek

Lake Oahe

Oak Creek

Claymore Creek

Smith Bay

85 86 83 84 87 88 12 20 1806

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 13 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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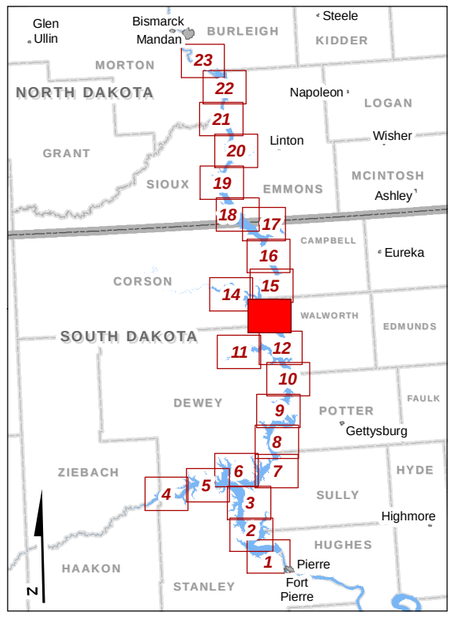
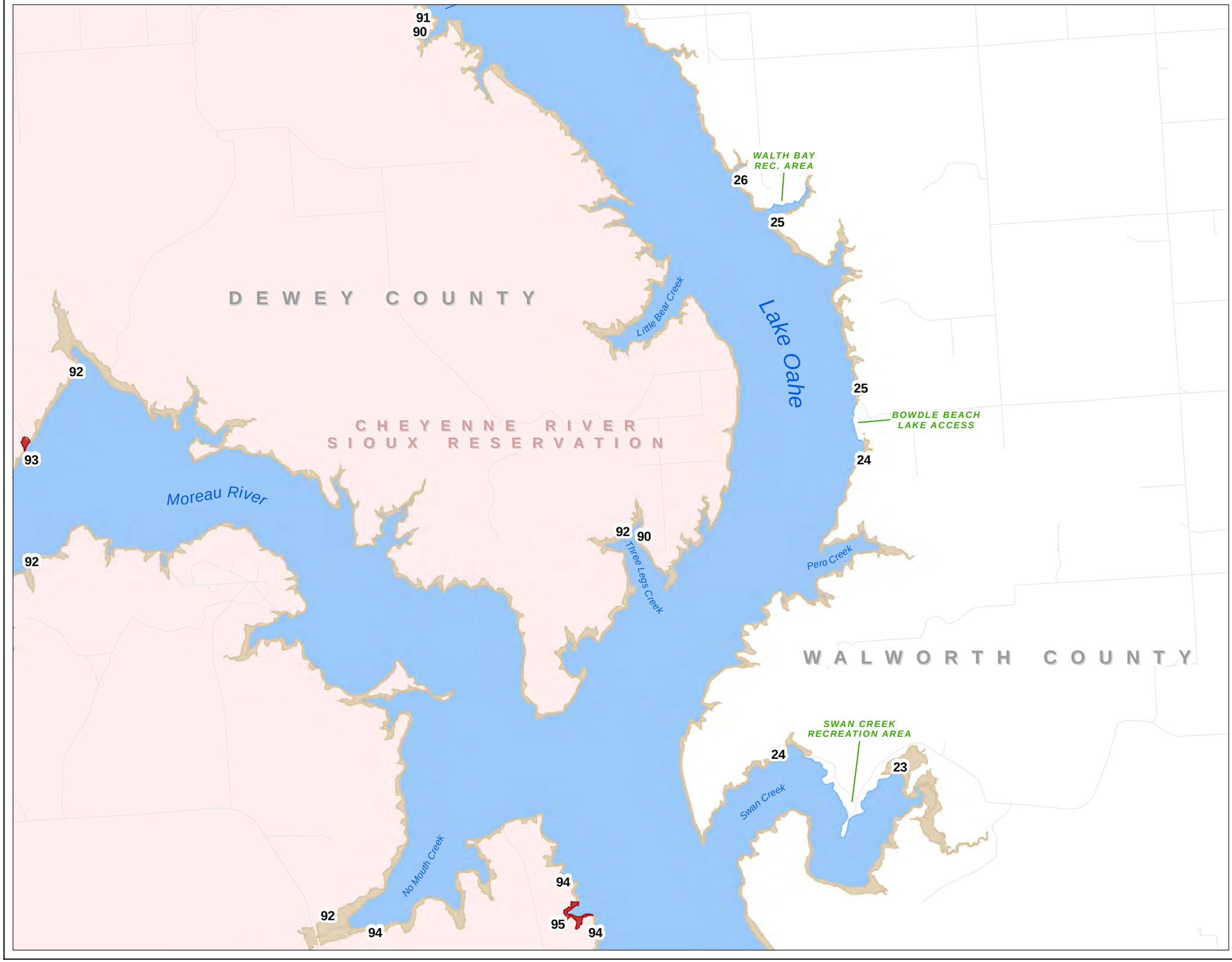


Master Plan

Oahe Project / Lake Oahe

Current Land Classification



Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 12 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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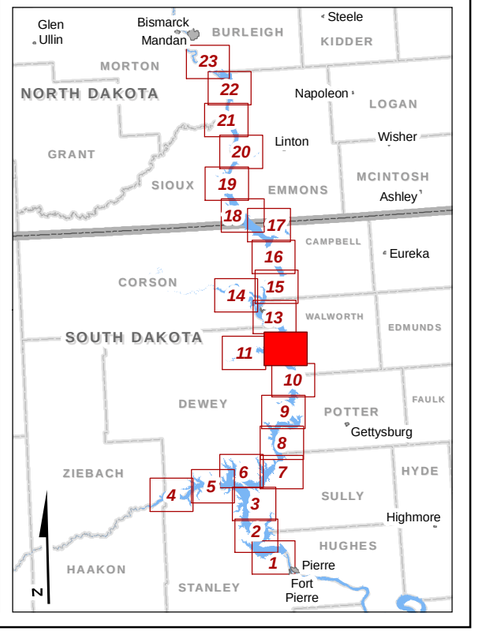

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

DEWEY COUNTY

CHEYENNE RIVER SIOUX RESERVATION

Lake Oahe

Moreau River

Beaver Creek

92

93

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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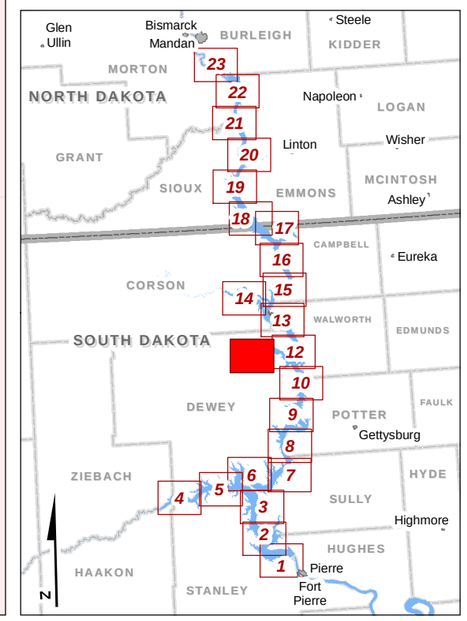
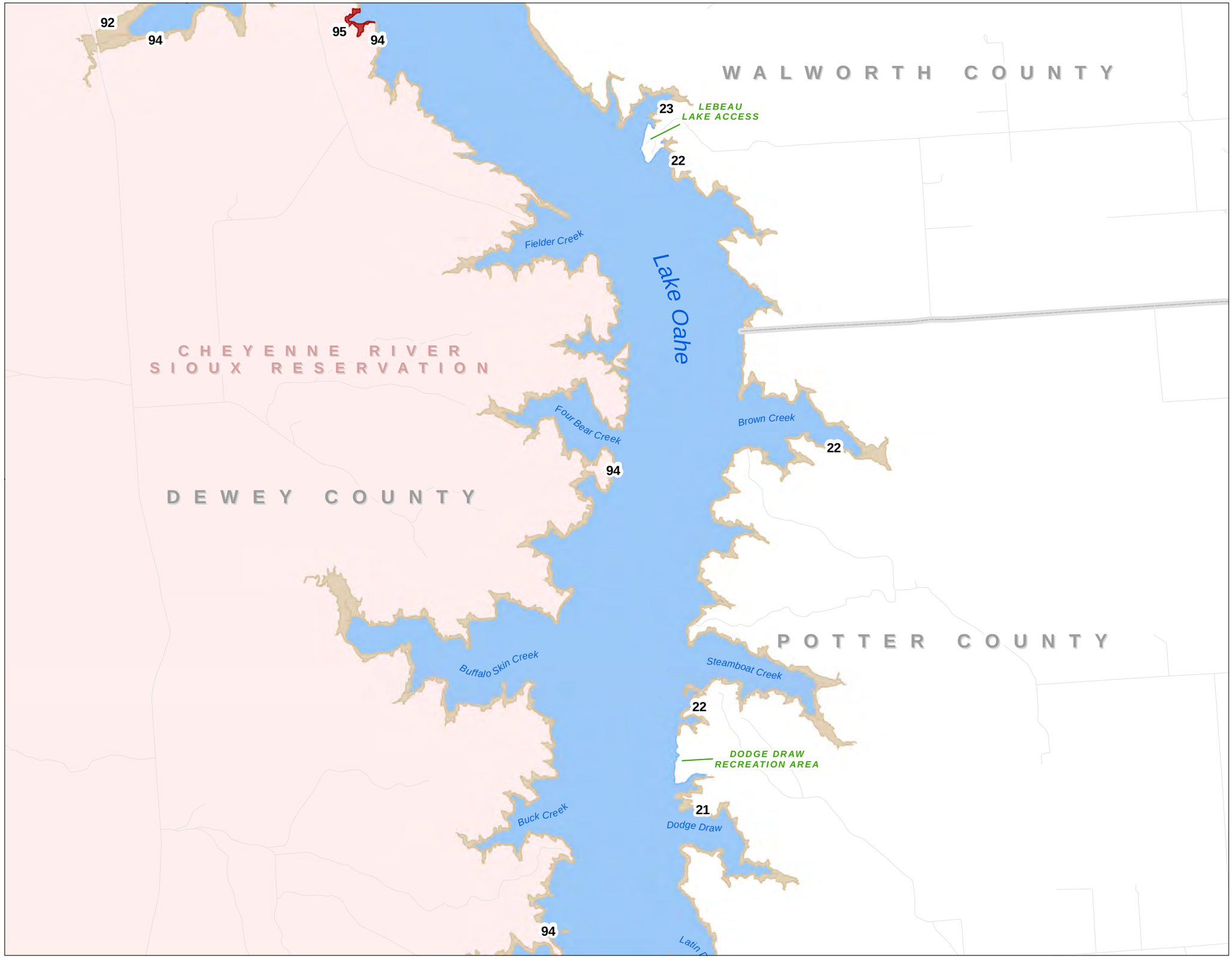


Master Plan

Oahe Project / Lake Oahe

Current Land Classification



Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 10 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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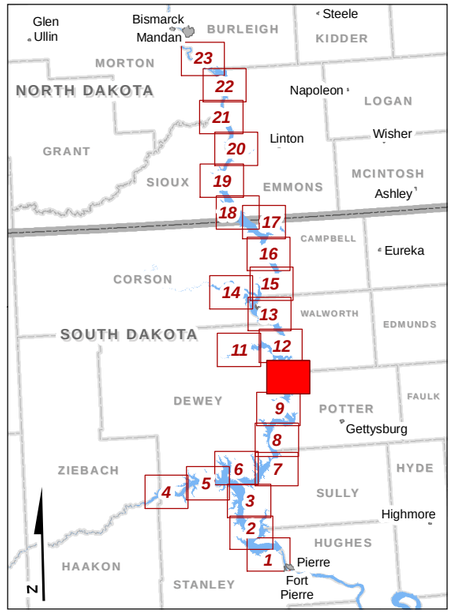

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 9 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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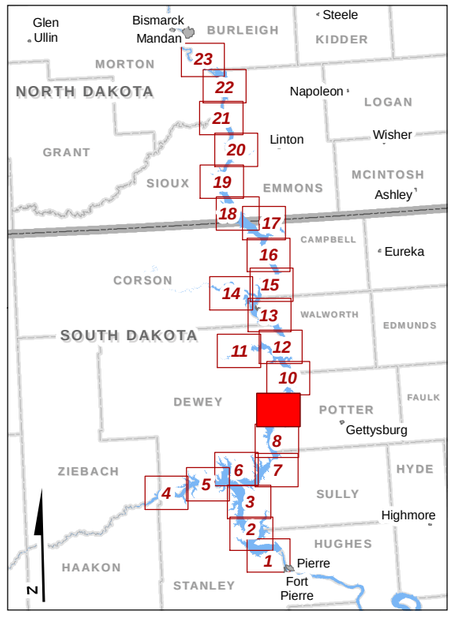


DEWEY COUNTY

POTTER COUNTY

CHEYENNE RIVER SIOUX RESERVATION

Lake Oahe

Swift Bird Creek

Swede's Draw

Latin Draw

Cheyenne Creek

Stove Creek

WEST WHITLOCKS REC. AREA

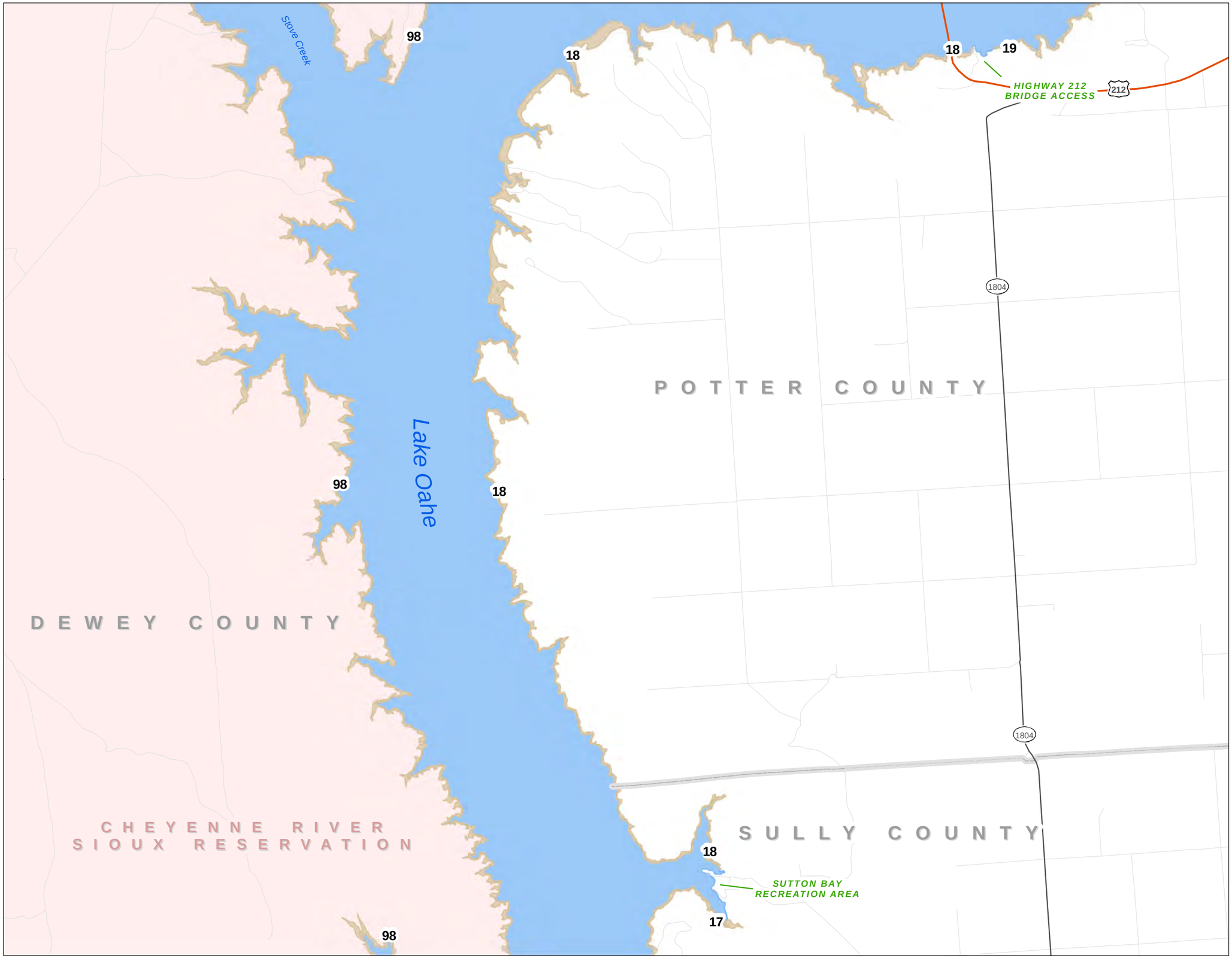
EAST WHITLOCKS REC. AREA

212

Master Plan

Oahe Project / Lake Oahe

Current Land Classification



Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 8 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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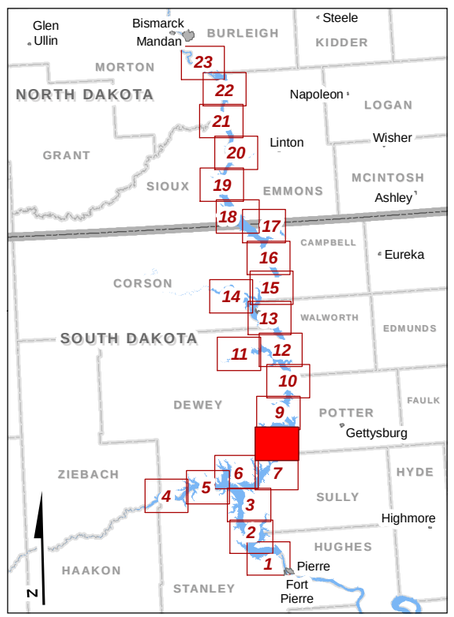

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

CHEYENNE RIVER SIOUX RESERVATION

DEWEY COUNTY

SULLY COUNTY

Lake Oahe

Alberts Creek

Bull Creek

Willow Creek

Fairbank Creek

SUTTON BAY RECREATION AREA

BUSH'S LANDING RECREATION AREA

1804

18 17 98 99 99 17 16 16 99 16 15

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 7 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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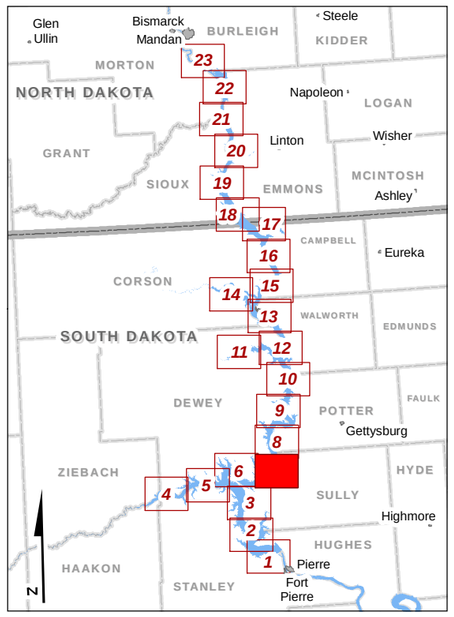
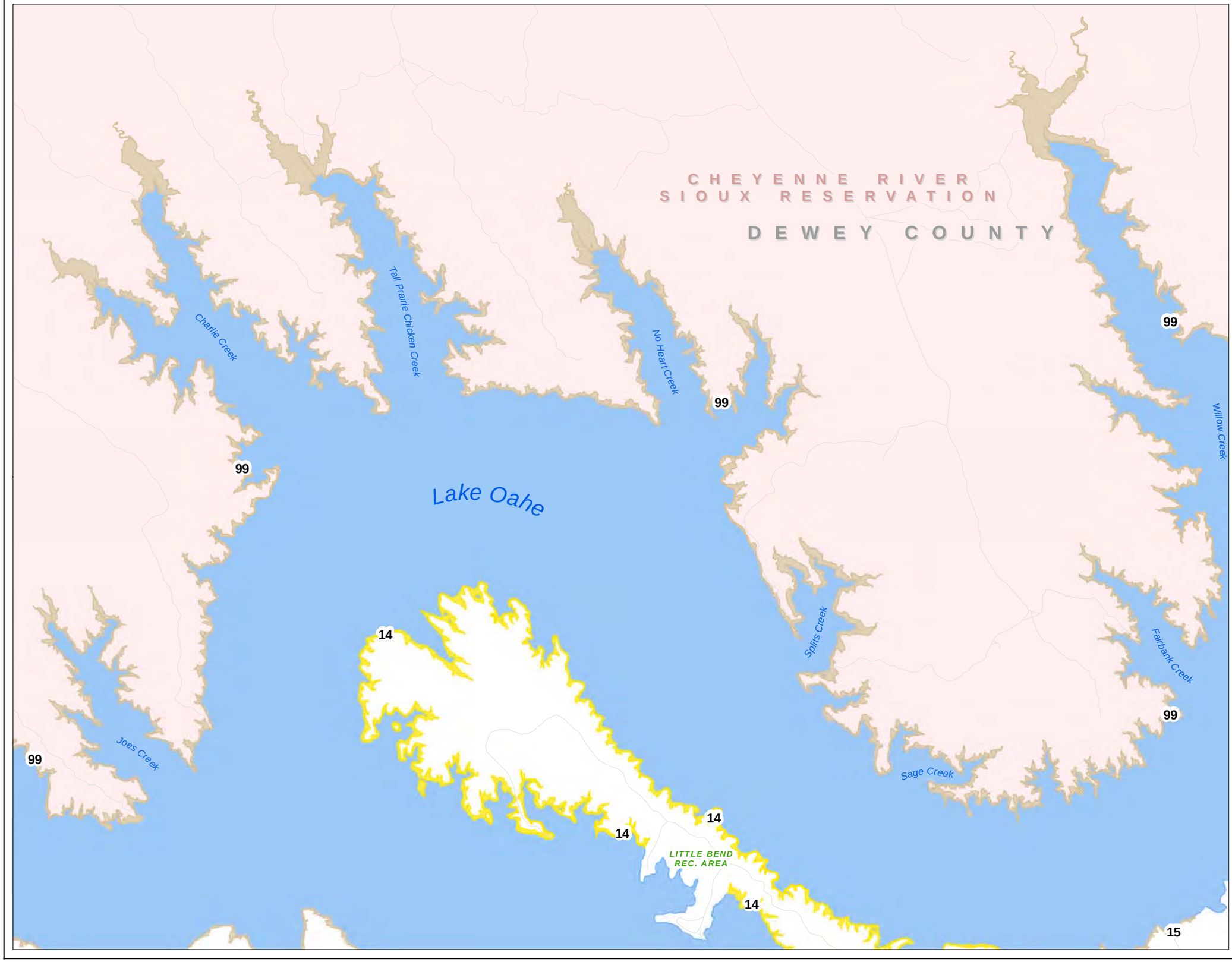


Master Plan

Oahe Project / Lake Oahe

Current Land Classification



Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 6 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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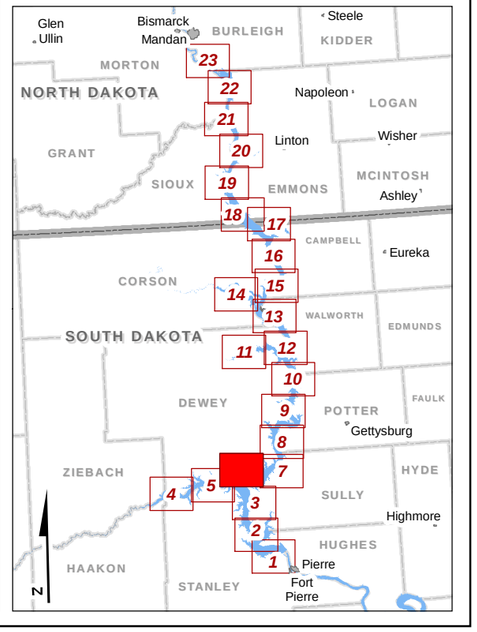

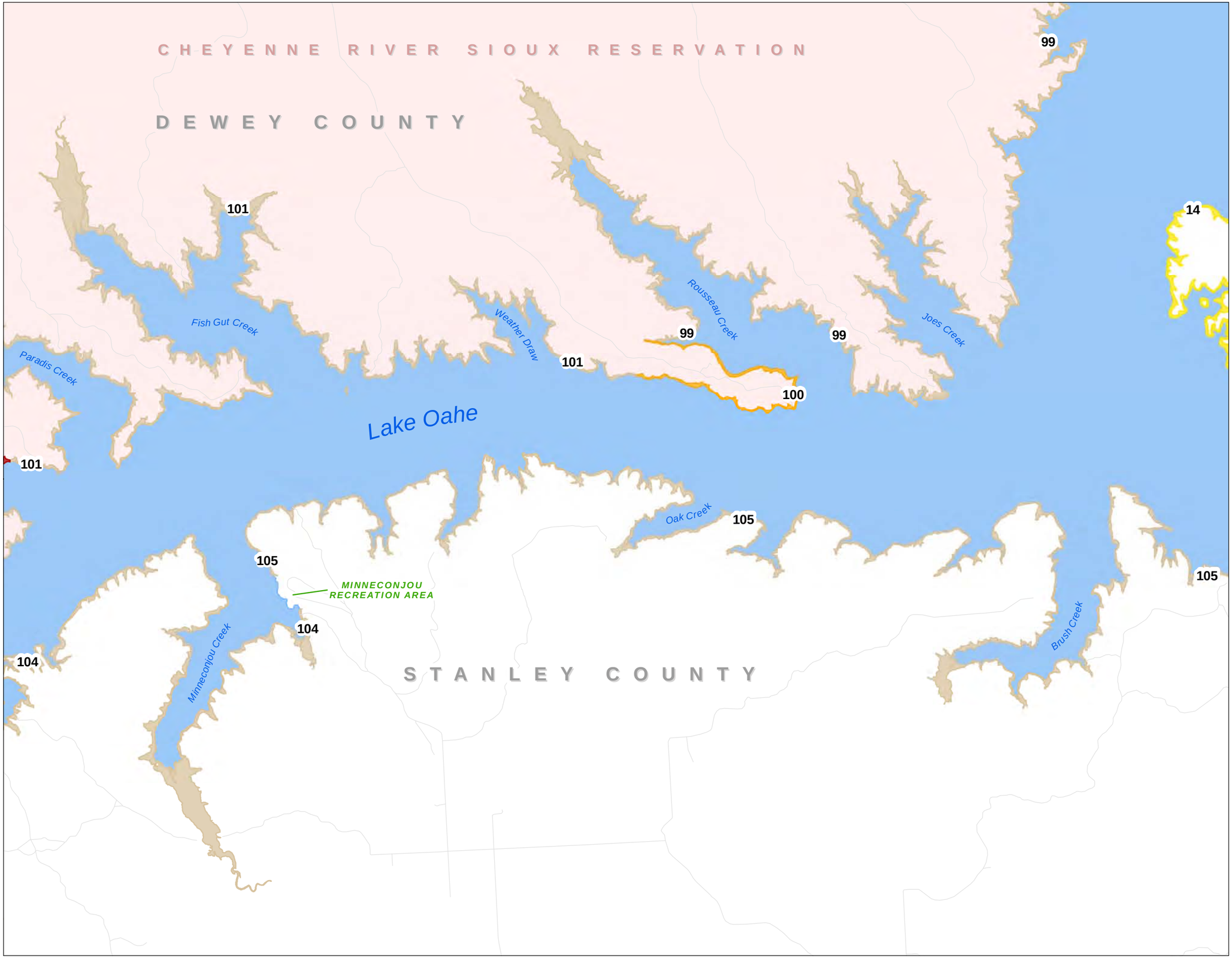

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 5 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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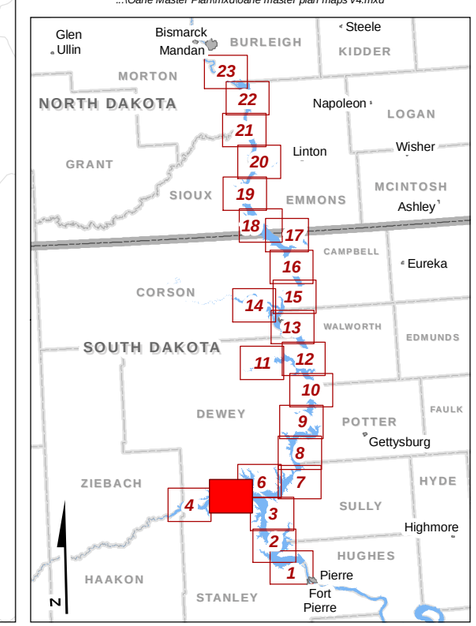
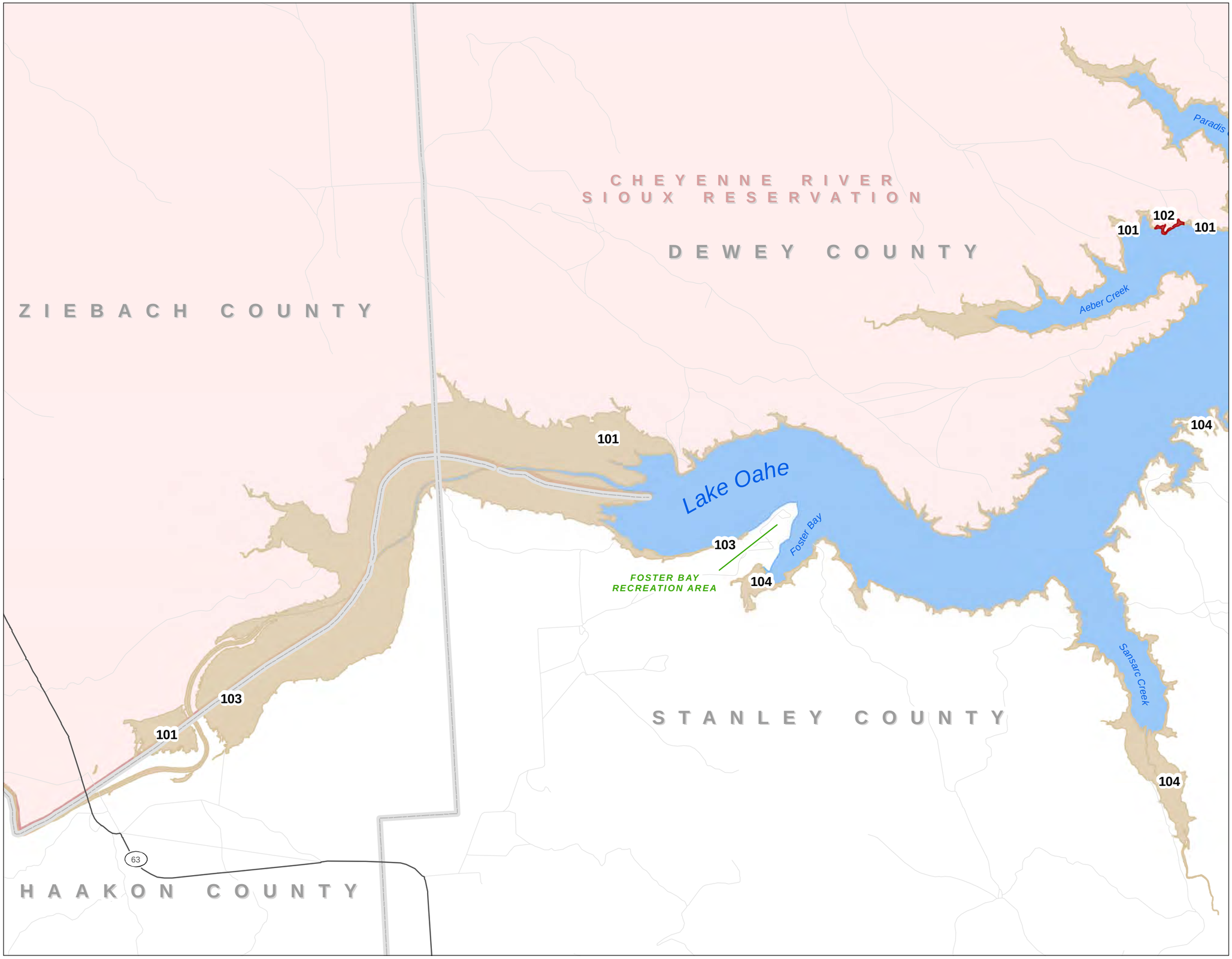


Master Plan

Oahe Project / Lake Oahe

Current Land Classification



Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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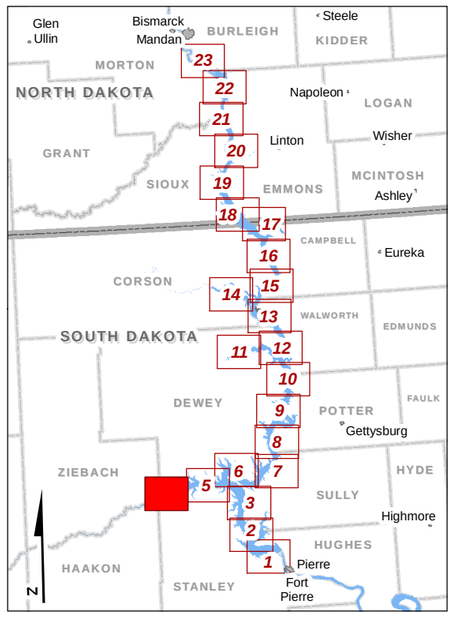

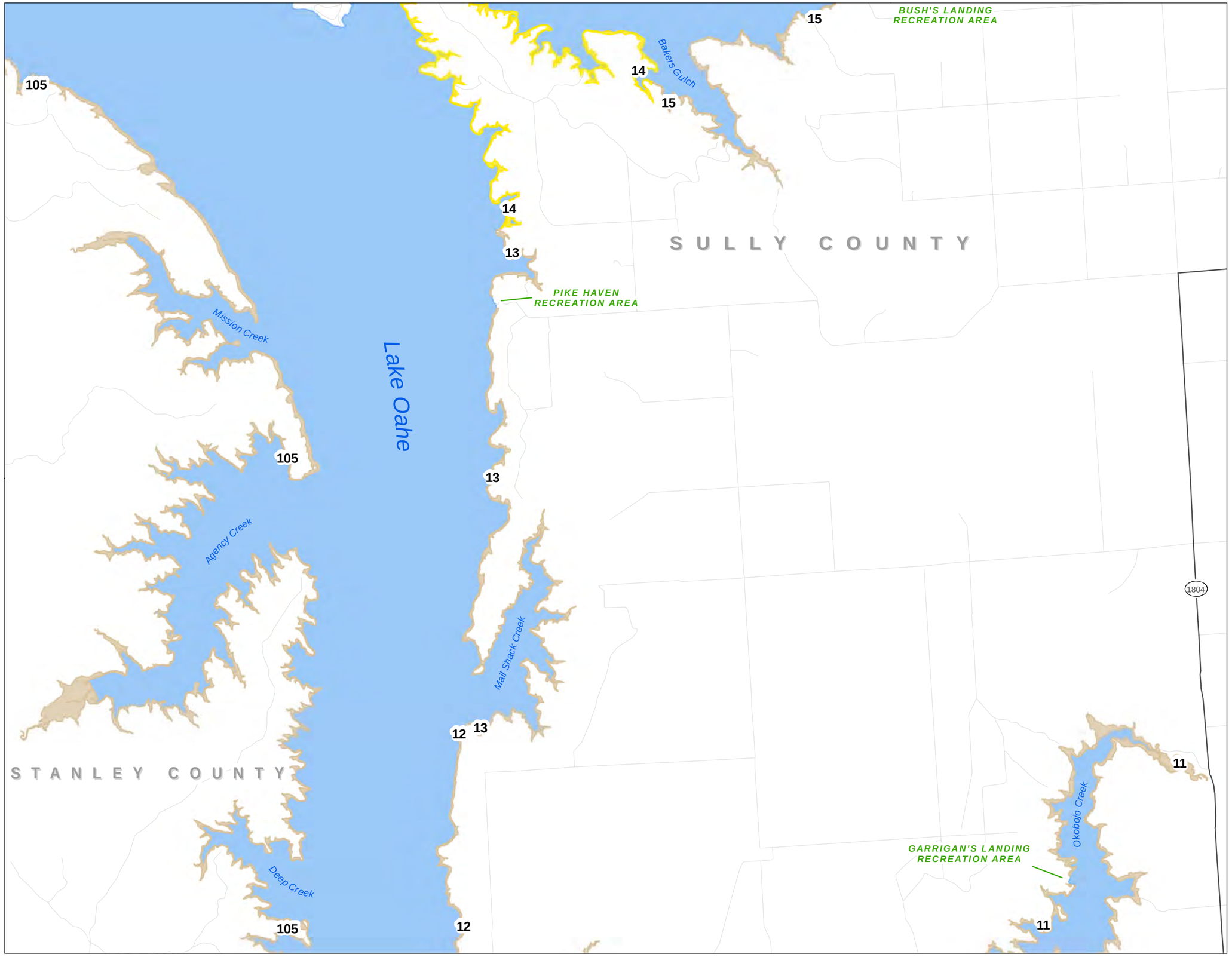

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 3 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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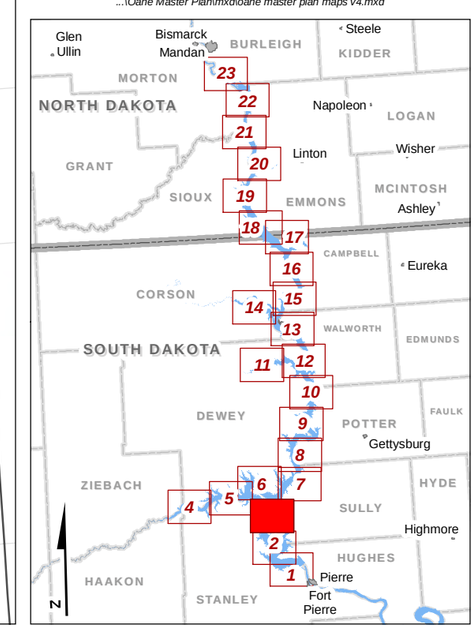

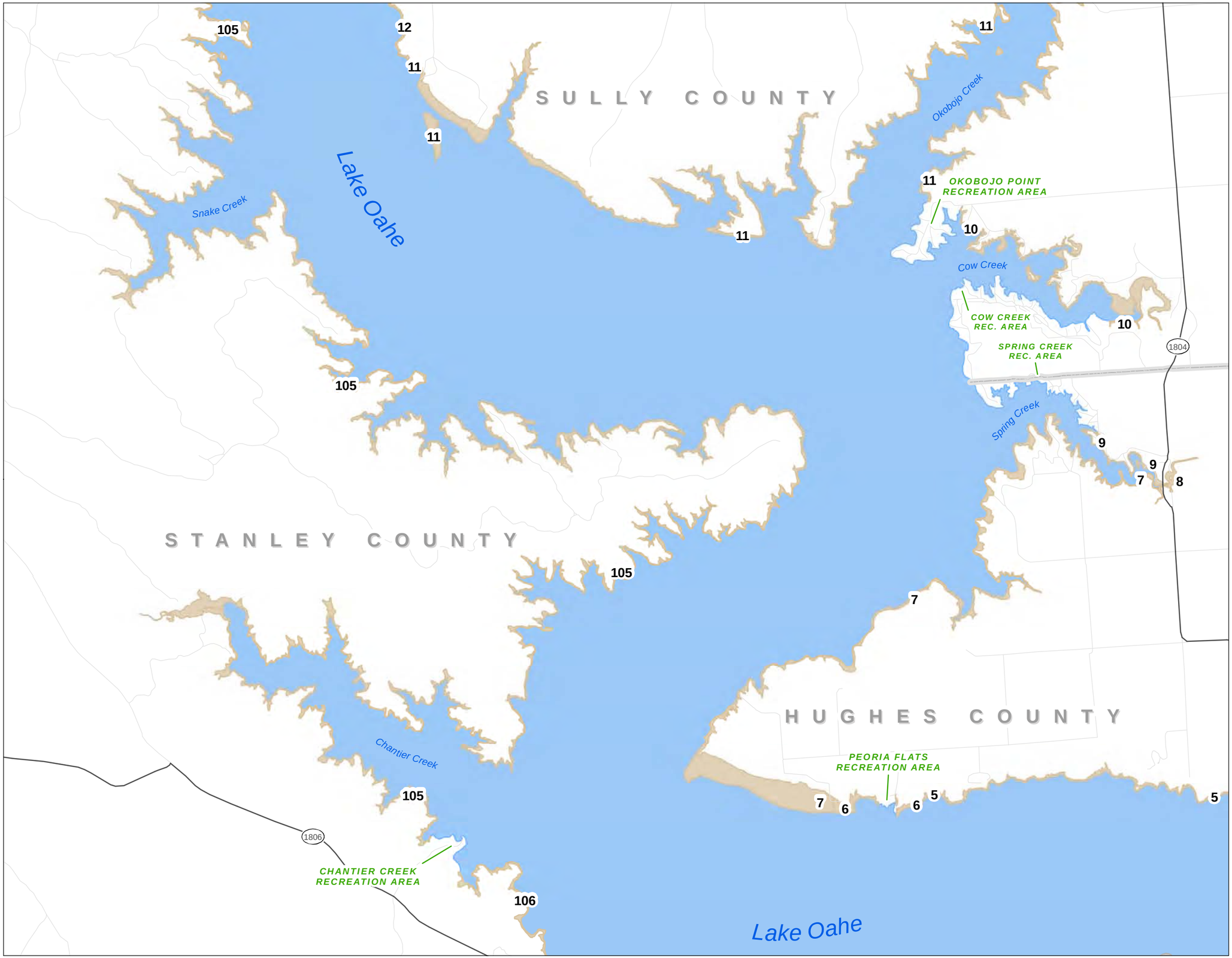

Master Plan

Oahe Project / Lake Oahe

Current Land Classification

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 2 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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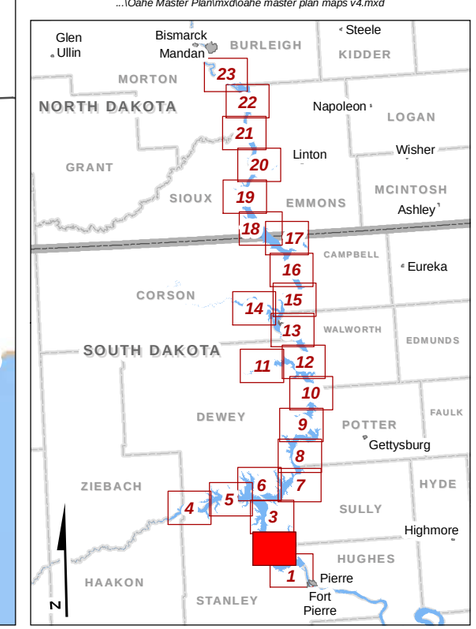


Master Plan

Oahe Project / Lake Oahe

Current Land Classification

HUGHES COUNTY

STANLEY COUNTY

Lake Oahe

PEORIA FLATS RECREATION AREA

Pierre

Fort Pierre

1804

1806

14

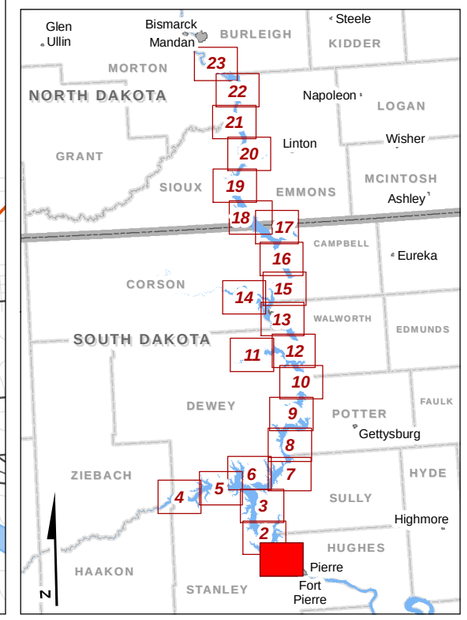
83

Land Classification

- Project Operations
- Perpetual Lease
- Recreation - Intensive Use
- Recreation - Low Density Use
- Recreation - Future Use
- Wildlife Management
- Environmentally Sensitive
- Water
- Flowage Easement

Plate 1 of 23

0 0.5 1 2 Miles

1 Inch = 1 Mile

U.S. Army Corps of Engineers / Omaha District - Omaha, Nebraska
Operations - Natural Resources Section (J. Cowman | 24 Aug 10)
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