10-L-51

STAFF SUMMARY SHEET

	TO	ACTION	SIGNATURE (Surname), GRADE AND DATE		TO	ACTION	SIGNATURE (Surname), GRADE AND DATE
1	CES/CD	Coord	Klepper OCT 0 1 2003	6	MSG/CC	Coord	Jones 28 OCT
2	CES/CC	Coord	20oct03	7	RQW/CCEA	Review	28 Oct
3	RQW/JA	Coord	16Oct03	8	RQW/CCS	Review	Rommer 29 OCT
4	RQW/SE	Coord	MAJ Christopher A. Schwartz 20OCT03	9	RQW/CCE	Review	Maj 31 Oct
5	RQW/PA	Coord	Capt 30Oct03	10	RQW/CV	Sign	

SURNAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S INITIALS	SUSPENSE DATE
Lee, GS-12	CES/CEVA	7-5881	gwl	

SUBJECT: Approval of Release of Draft Environmental Documents -- Expanded Bird-Aircraft Strike Hazard (BASH) Program -- for Public Review

DATE: 29 Sep 03

SUMMARY

1. Tab 1 is the Draft Finding of No Significant Impact (FONSI) for the Expanded Bird-Aircraft Strike Hazard (BASH) Program. Tab 2 is the Draft Environmental Assessment (EA) for the same project. Tab 3 is the news release for the same project.

2. As per 32 Code of Federal Regulations (CFR) 989, The Environmental Impact Analysis Process, the Staff Judge Advocate and the Public Affairs Office should review the attached Environmental Impact Analysis Process (EIAP) documents for legal sufficiency and public affairs issues.

3. As per 32 CFR 989, a public review period, including notification of local governments and the Georgia State Clearinghouse and consultation with appropriate state and federal agencies, must be conducted on all draft FONSIs and EAs. All comments received during this review period must be addressed in the final EA for the project.

4. As per 32 CFR 989, the release of environmental documents for review by the public and the approval of final environmental documents by the Chairman of the Environmental Protection Committee does not obligate the Air Force in any way to conduct the proposed action or any of the alternatives. The purpose of the EA and FONSI is merely to document that environment impacts were considered prior to implementation of any federal action.

5. As per 32 CFR 989, RQW/CV is authorized, as Chairman of the Environmental Protection Committee, to authorize the release of the draft unsigned FONSI and EA for public review and comment.

6. RECOMMENDATION: RQW/CV approve the release of the draft FONSI and EA for public review and comment by signing SSS where indicated.

JOHN B. MITCHELL
Environmental Flight Chief

Tabs
1. Finding of No Significant Impact (FONSI)
2. Environmental Assessment (EA)
3. News Release

AF FORM 1768, SEP 84 (EF-V4) (FORM FLO2) PREVIOUS EDITION WILL BE USED.

Report Documentation Page

Form Approved
OMB No. 0704-0188

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SEP 2003		**00-00-2003 to 00-00-2003**

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	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **347th Civil Engineer Squadron (347 CES/CEVA),3485 Georgia Street,Moody AFB,GA,31699**	8. PERFORMING ORGANIZATION REPORT NUMBER
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13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**113**	

IMPLEMENTATION OF EXPANDED BIRD - AIRCRAFT STRIKE HAZARD (BASH) PROGRAM FOR MOODY AFB AND PRIVATE AND PUBLIC LANDS SURROUNDING MOODY AIR FORCE BASE, GEORGIA
FINDING OF NO SIGNIFICANT IMPACT

1.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

1.1 Proposed Action

A Bird-Aircraft Strike Hazard (BASH) exists at and around Moody AFB and its vicinity because of the presence of resident and migratory birds and other wildlife species (i.e. white-tailed deer, alligators, coyotes, foxes). During the past 10 fiscal years, Moody AFB aircraft have been involved in an average of 23.5 birdstrikes annually, with a range from 12 to 35 strikes. While an on-base BASH program has been in existence for several years, it has been determined that an off-base BASH program needs to be implemented within a five-mile radius of the Moody AFB airfield to reduce risks to pilots and aircraft from three target species: cattle egrets, black vultures, and turkey vultures. In support of the military mission, Moody Air Force Base (AFB) has prepared an off-base BASH plan and proposes to implement a program designed to minimize aircraft exposure to these three target species within the 5-mile radius region of influence (ROI). These activities would include both non-lethal and lethal strategies and techniques specifically designed to minimize BASH risks for Moody AFB pilots. These activities would be implemented on private and public lands, as approved by the landowners or managers, and in accordance with all applicable legal and real estate requirements. As part of this action, Moody AFB has also proposed adding the turkey vulture (*Cathartes aura*) and black vulture (*Coragypus atratus*) to the list of species authorized to be lethally controlled within the boundaries of the installation and to increase the number of cattle egrets (*Bubulcus ibis*) authorized to be lethally controlled on the installation as required to protect human health and safety.

The proposed action includes:

A. Non-lethal Strategies and Techniques:

1) Prediction of bird occurrence in the Moody AFB airspace by utilizing bird avoidance models (BAMs) specifically prepared for Moody AFB.

2) Forage reduction through mowing and removal of carrion and dead livestock within the ROI.

3) Wildlife dispersal techniques (or harassment) will occur using bioacoustics, pyrotechnics, propane gas cannons, and visual dispersal (i.e. vehicle harassment; use of remote-controlled planes; use of mylar type, laser, eye spot balloons; and effigies).

4) Nest destruction of cattle egret nests will occur prior to the laying of eggs. This action will take place only in known cattle egret rookeries, including the Grand Bay Wildlife Management Area (WMA). It is anticipated that up to 1,000 nests could be destroyed annually to discourage nesting by cattle egrets.

B. Lethal Strategies and Techniques:

1) Addling, destruction, and oiling of cattle egret eggs would occur in known cattle egret rookeries to prevent the hatching of cattle egrets. It is anticipated that a maximum of 6,000 eggs would be prevented from hatching annually under this technique.

2) Shooting and/or trapping and euthanasia would be used as a last resort to reinforce harassment techniques and to discourage congregation and nesting by target species. A maximum of 20 black vultures, 40 turkey vultures, and 400 cattle egrets could be killed annually within the ROI.

1.2 Alternatives

The three alternatives to the proposed action that were evaluated in the environmental assessment were: 1) sole implementation of non-lethal strategies and techniques; 2) sole implementation of lethal strategies and techniques; and, 3) the no action alternative.

The following alternatives were rejected because they were not feasible, were impracticable or were deemed to be ineffective based on literature reviews of efficacy: 1) lethal removal of all bird species in known roosts; 2) removal of aircraft from Moody AFB; 3) use of chemical repellents; 4) use of ultrasonic devices; 5) sole implementation of environmental management (habitat modification); and, 6) live trapping and relocation of cattle egrets and vultures. The environmental impacts of these alternatives were not evaluated in the environmental assessment.

2.0 SUMMARY OF ENVIRONMENTAL IMPACTS

There would not be any significant impacts to the environment as a result of implementation of the proposed action or any of the evaluated alternatives. Also, there were no significant cumulative effects noted that would occur as a result of implementation of the proposed action or any of the evaluated alternatives.

3.0 CONCLUSION:

The attached EA was prepared and evaluated pursuant to the National Environmental Policy Act (Public Law 91-190, 42 U.S.C. 4321 *et seq.*) and according to 32 Code of Federal Regulations 989, *The Environmental Impact Analysis Process.* I have concluded that the proposed project titled, "Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program for Moody Air Force Base and Private and Public Lands Surrounding Moody Air Force Base, Georgia" does not constitute a "major Federal action significantly affecting the quality of the human environment" when considered individually or cumulatively in the context of the referenced act, including both direct and indirect impacts. Therefore, no further study is required, and a Finding of No Significant Impact is thus warranted.

Howard Short

HOWARD SHORT, Colonel, USAF
Chairperson, 347 RQW Environmental Protection Committee

2 APR 04
Date

UNITED STATES DEPARTMENT OF DEFENSE
DEPARTMENT OF AIR FORCE
MOODY AIR FORCE BASE

ENVIRONMENTAL ASSESSMENT

for

Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program
for Moody Air Force Base and
Private and Public Lands Surrounding Moody Air Force Base, Georgia

In Cooperation With:

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

September 2003

TABLE OF CONTENTS

ACRONYMS

ADC	Animal Damage Control
AFB	Air Force Base
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BDM	Bird Damage Management
CFR	Code of Federal Regulations
DOD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FY	Fiscal Year
Georgia DNR	Georgia Department of Natural Resources
IWDM	Integrated Wildlife Damage Management
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
SOP	Standard Operating Procedure
ROI	Region of Influence
RTE	Rare, Threatened, and Endangered Species
USAF	United States Air Force
USGS	United States Geological Survey
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WMA	Wildlife Management Area
WS	Wildlife Services

BIRD DAMAGE MANAGEMENT ON PRIVATE AND PUBLIC LANDS SURROUNDING MOODY AIR FORCE BASE, GEORGIA

ENVIRONMENTAL ASSESSMENT

1.0 BACKGROUND, PURPOSE, AND NEED FOR THE PROPOSED ACTION

1.1 Background

A bird-aircraft strike hazard (BASH) exists at Moody Air Force Base (AFB) (Figure 1) and its vicinity because of the presence of resident and migratory birds and other wildlife species (i.e. white-tailed deer, alligators, coyotes, foxes) in and around the airfield environment and in the Moody AFB operational airspace. During the past 10 fiscal years, Moody AFB aircraft have been involved in an average of 23.5 birdstrikes annually, with a range from 12 to 35 strikes. In support of the military mission, Moody AFB has implemented a BASH management program designed to minimize aircraft exposure to potentially hazardous wildlife strikes, especially birds, within the boundaries of the installation.

The Moody AFB BASH management program is implemented using an integrated approach to wildlife damage management (or control) termed "Integrated Wildlife Damage Management (IWDM)." Under this approach, the installation uses a variety of wildlife damage management techniques and practices, ranging from environmental management (habitat modification), monitoring of wildlife in the vicinity of the installation, wildlife dispersal techniques (harassment), and lethal and non-lethal control of high-risk individual animals. Additionally, Moody AFB has agreements (i.e. easements or licenses) with local landowners which are designed to reduce the attractiveness of agricultural areas adjacent to the base to birds and other wildlife species. For example, livestock owners are required to remove dead livestock with 24 hours after discovery.

Currently, activities associated with the BASH management program are limited to areas within the control of Moody AFB, including areas regulated under easements or license agreements. However, based on monitoring data and an operational risk management (ORM) plan developed for the Moody AFB operating environment, it was determined that installation-specific activities have not been effective at reducing risk from some species, especially large birds that have been documented to roost and/or nest outside and immediately adjacent to the installation boundary. Therefore, Moody AFB has proposed expanding the current BASH management program by developing and implementing a plan to resolve conflicts with bird species affecting Moody AFB aircraft within a five-mile radius of the installation. These activities would be implemented on private and public lands, as approved by the landowners or managers, and in accordance with all

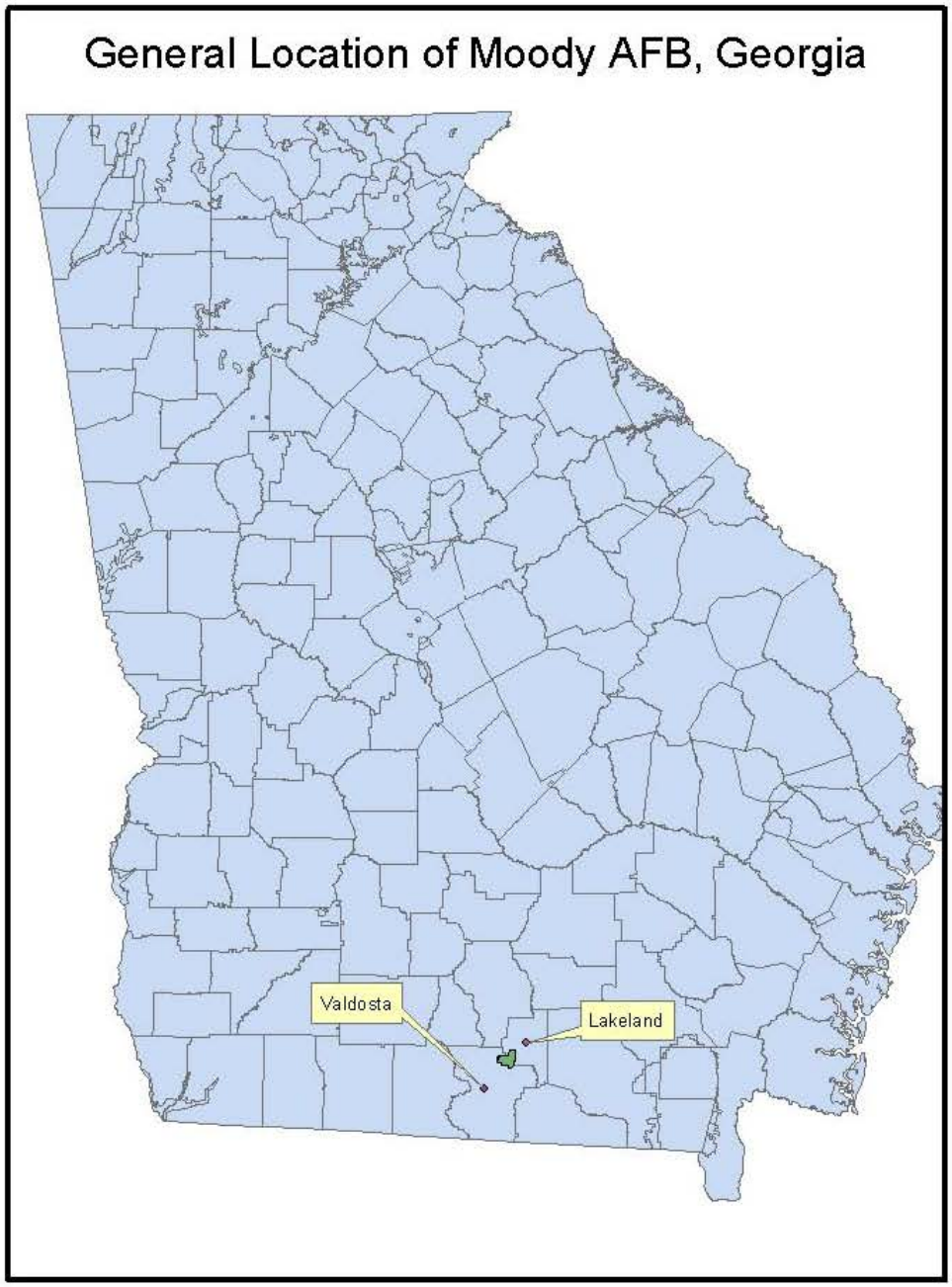


Figure 1

applicable legal and real estate requirements. As part of this action, Moody AFB has also proposed adding the turkey vulture (*Cathartes aura*) and black vulture (*Coragypus atratus*) to the list of species authorized to be lethally controlled within the boundaries of the installation and to increase the number of cattle egrets (*Bubulcus ibis*) authorized to be lethally controlled on the installation as required to protect human health and safety.

1.2 Purpose

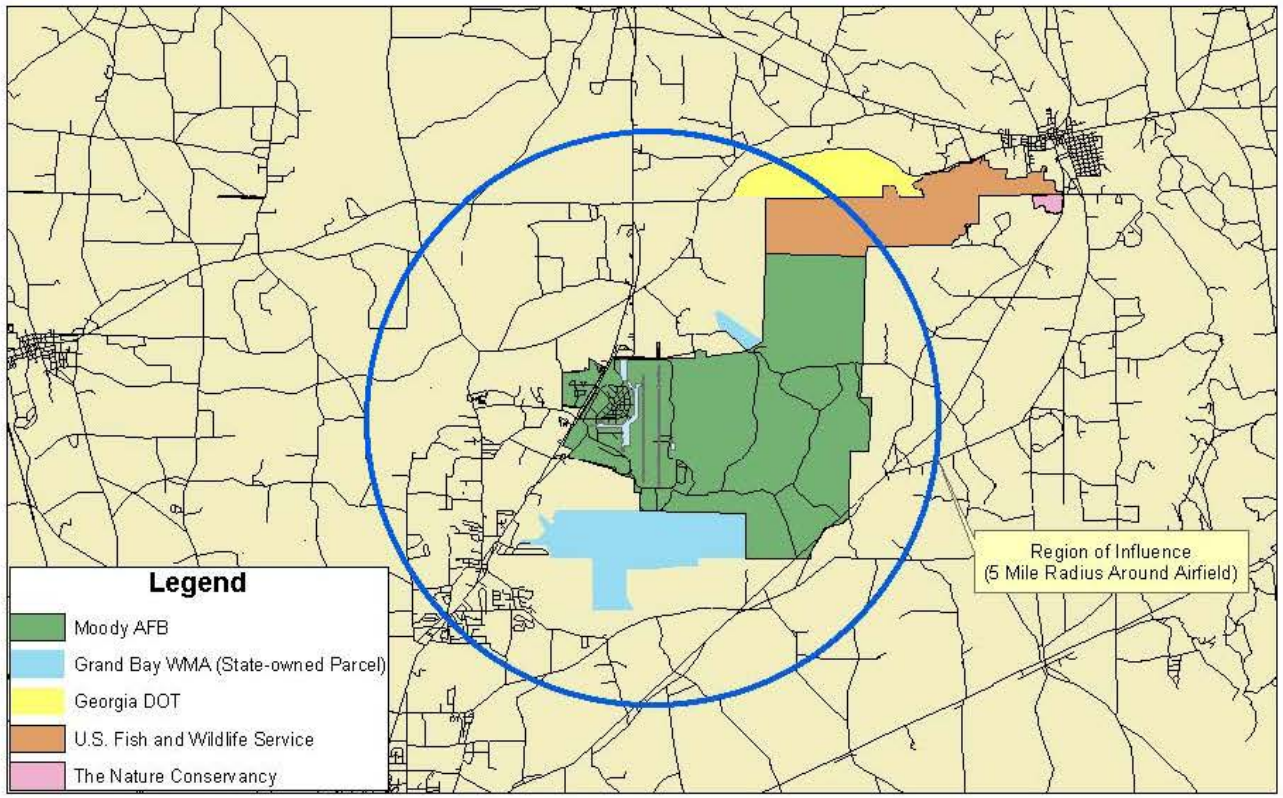
The purpose of this environmental assessment (EA) is to analyze and document the environmental effects associated with implementing the proposed action in accordance with the National Environmental Policy Act (NEPA) and the U.S. Air Force (USAF) implementing regulations, 32 Code of Federal Regulations (CFR) 989, *The Environmental Impact Analysis Process*. The draft EA and draft finding of no significant impact (FONSI) were made available to the public, interested parties, and state and federal agencies for review and comment prior to finalization and implementation of the proposed action or any of the analyzed alternatives.

This EA will remain valid until the USAF determines that new requirements for action or new alternatives having different environmental effects must be analyzed or new scientific research results change the original analyses. At that time, this analysis and document would be reviewed and revised as necessary. This EA will be reviewed each year to ensure that it is complete and still appropriate to the scope of the Moody AFB BASH management program activities.

1.3 Need for Action

1.3.1 Summary of the Proposed Action

The proposed action primarily concerns the development and implementation of a BASH management program on private and public lands within a five-mile radius of Moody AFB to protect property, human health, and human safety from risks associated with bird-aircraft strikes. This area is referred to throughout the document as the "Region of Influence" (ROI) (Figure 2). Additionally, this action includes adding the turkey vulture and black vulture to the list of species authorized to be lethally controlled within the boundaries of the installation and increasing the number of cattle egrets authorized to be lethally controlled on the installation. Similar to the currently approved Moody AFB BASH management program, the proposed action involves an integrated approach to minimize the risk of bird-aircraft strikes, allowing the use of any legal technique or method, used singly or in combination, to obtain the desired result (i.e., minimize risk to property, human health, and human safety from birds). Generally, non-lethal methods would be implemented first, followed by lethal control methods after habituation or non-response to non-lethal methods occurs; however, the use of any technique may be implemented at the discretion of the Moody AFB BASH team. Non-lethal methods proposed for implementation include prediction of bird occurrence in airspace



Region of Influence
Proposed Off-Base BASH Management Program
Moody AFB, Georgia

Figure 2

(avoidance), forage reduction, habitat modification, nest destruction, and wildlife dispersal techniques (harassment). Lethal control methods proposed for implementation include shooting, euthanasia following live capture, and egg destruction through addling or oiling. All activities proposed for implementation outside of the installation boundary would be contingent upon the permission of the landowner or manager and the acquisition of all appropriate legal and real estate documents, including federal and state permits. All management activities would comply with appropriate federal, state, and local laws and regulations. A detailed explanation of the proposed action is located at 3.2 below.

1.3.2 Objectives of the Proposed Action

The main objectives of the proposed BASH management program are to reduce the risk of damaging bird strikes and near misses to low-level training aircraft within the Moody AFB operating environment and to maintain runways and airfields below Bird Watch Condition Severe (Table 1-1). A secondary objective of the proposed BASH management program is to accomplish the main objectives without significantly impacting non-target avian populations or ecological functions within the proposed project area. Other objectives of the proposed action are to reduce the number of vultures using the roost at Grand Bay WMA by 50% by encouraging them to relocate their roost to another location outside the ROI, and to reduce the number of cattle egrets currently using the Grand Bay WMA rookery by at least 50% from current population levels.

1.3.3 Justification for Proposed Action

Wildlife creates a variety of problems at airports that can compromise safe aircraft operations. The most noteworthy are the thousands of collisions that occur annually between wildlife and aircraft (Cleary et al., 1999). These strikes can damage or destroy aircraft and result in millions of dollars in direct and indirect damages. More importantly, wildlife strikes can cause serious injury and death to pilots and other personnel. One of the worst incidents occurred in Boston in 1960 when 62 people were killed after an airliner collided with a flock of starlings (*Sturnus vulgaris*) and crashed (Terres, 1980). From 1986 through 1997, wildlife strikes with Air Force aircraft resulted in $500 million in damage and 33 fatalities (Lovell, 1997). Fortunately, wildlife strikes involving Moody AFB aircraft have not resulted in catastrophic accidents involving the loss of human life since 1987. However, the potential is clearly present, and such accidents are occurring with increasing frequency nationwide (Cleary et al., 1999; Dolbeer, 2000). This increase in birdstrike frequency has been attributed to the synergistic interactions of three
predominant factors: 1) populations of many species hazardous to aviation have increased and adapted to urban environments, including airports; 2) air traffic in the United States has increased over the past 20 years; and, 3) modern two-engine turbojet and turbofan aircraft are "generally less apparent to birds because these aircraft are faster and quieter than older aircraft" (Dolbeer, 2000). Since 1991, Moody AFB aircraft have

been involved in an average of 23.5 bird strikes annually, with a range from 12 to 35 strikes.
Table 1-2 shows the current bird strike rate per 1000 sorties (a sortie consists of a single military aircraft flight from initial takeoff through final landing) for different Moody AFB aircraft during the past three fiscal years (1 October through 30 September). Caution should be used in interpretation of strike reports because bird strikes tend to be under-reported. Single strikes involving small birds may not be noticed by aircrews, especially those flying larger-frame aircraft such as the HC-130. In some instances, bird strikes are only discovered when bird remains (e.g. blood, feathers, etc.) are noted on the aircraft during post-flight inspections, which makes it impossible to determine where and when the strike occurred. Therefore, the annual average number of bird strikes reported and the bird strike rate per 1000 sorties is a conservative measure of bird strikes; the actual number of strikes may be significantly greater.

The geographic distribution of known bird strike locations involving Moody AFB aircraft is presented in Figure 3. Moody AFB aircraft routinely strike a variety of bird species, including vultures, egrets, herons, raptors, and passerines (USAF, 2001a). See Figures 4 and 5 for the geographic distribution of reported avian strikes at known locations involving Moody AFB aircraft from 1990 through 2003. Most of the bird strikes involving Moody AFB aircraft consist of single passerines and are not catastrophic in nature. However, even though the probability of a catastrophic event is low, the Air Force is committed to reducing the probability of a catastrophic strike by implementing new programs and techniques to protect both pilots and aircraft. For example, designers constantly work on improving canopies, shields, and aircraft parts to enable them to withstand strikes while at the same time scientific research is conducted to develop new and more effective techniques to minimize the presence of birds in the airfield environment.

Table 1-1 Description of Bird Condition Codes

Bird Condition Code	Description
LOW	Normal bird activity on and above the airfield with a low probability of hazard. Upon extended normal bird activity no bird watch condition need be declared.
MODERATE	Concentrations of birds observable in locations that represent a probable hazard to safe flying operations. This condition requires increased vigilance by all agencies and extreme caution by aircrews. For example: 10-30 small birds on the airfield environment but not near the runway or approach/departure paths may constitute condition moderate. Similarly, one or two raptors or vultures flying near the runway may constitute bird watch condition MODERATE.
SEVERE	Heavy concentration of birds on or immediately above the active runway or other specific locations that represent an immediate hazard to safe flying operations. Aircrews must thoroughly evaluate mission need before operating in areas under condition SEVERE. The area declared severe shall be open only by specific pilot request to 347 Rescue Wing Supervisor of Flying upon being advised of the bird watch condition. For example: 20-40 small birds congregating on approach may warrant condition severe.

Table 1-2 -- Bird Strike Rate per 1000 Sorties

Aircraft	FY 2001	FY 2002	FY 2003
HH-60 (Helicopter)	5.1	5.0	11.0
C-130 (Cargo)	21.6	10.5	16.6
T-38 (Fighter Trainer)	--[1]	0.6	1.0
T-6A (Prop Trainer)	--[1]	1.1	2.9

[1]T-38 and T-6A aircraft were not used at Moody AFB until FY 2002

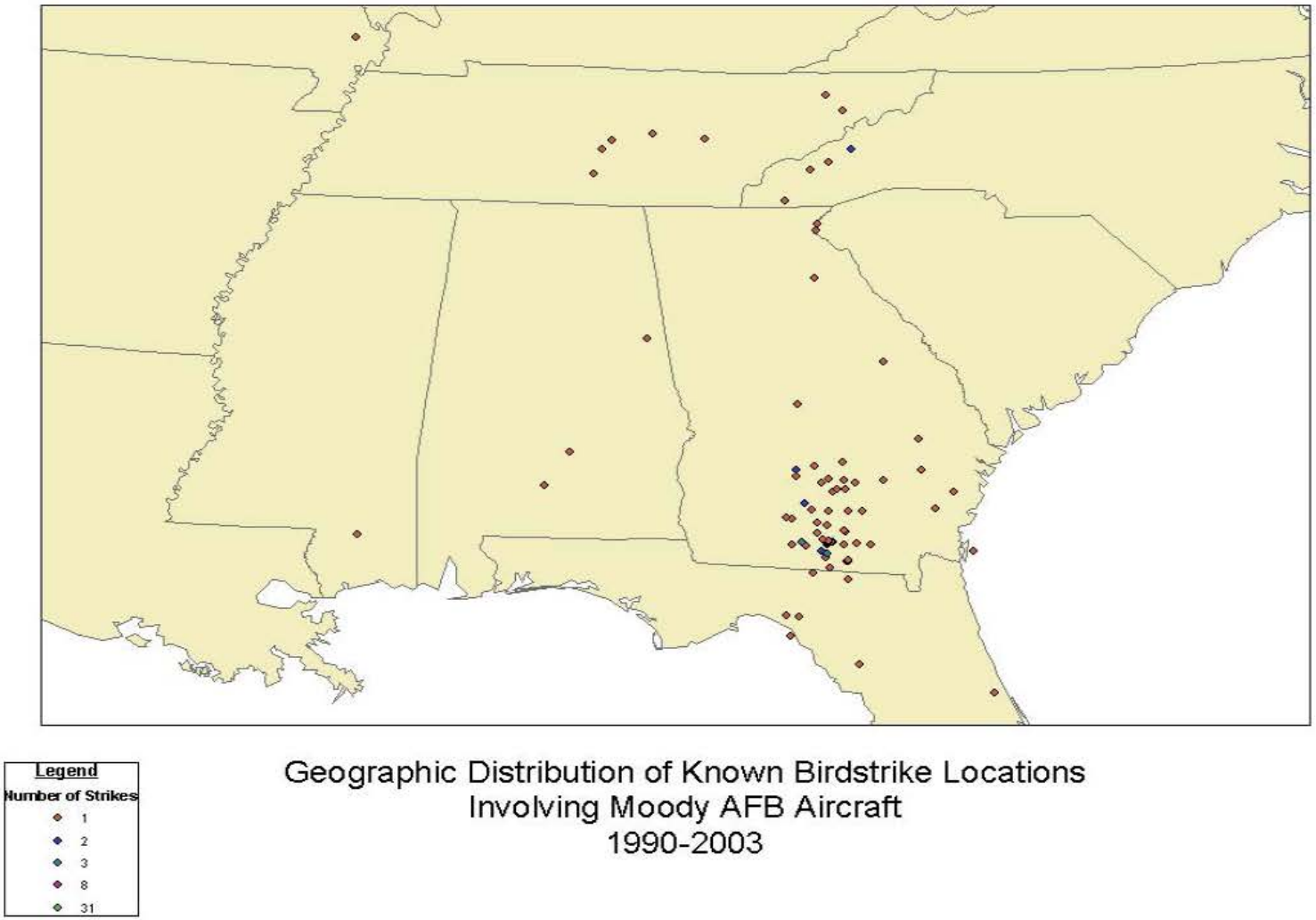
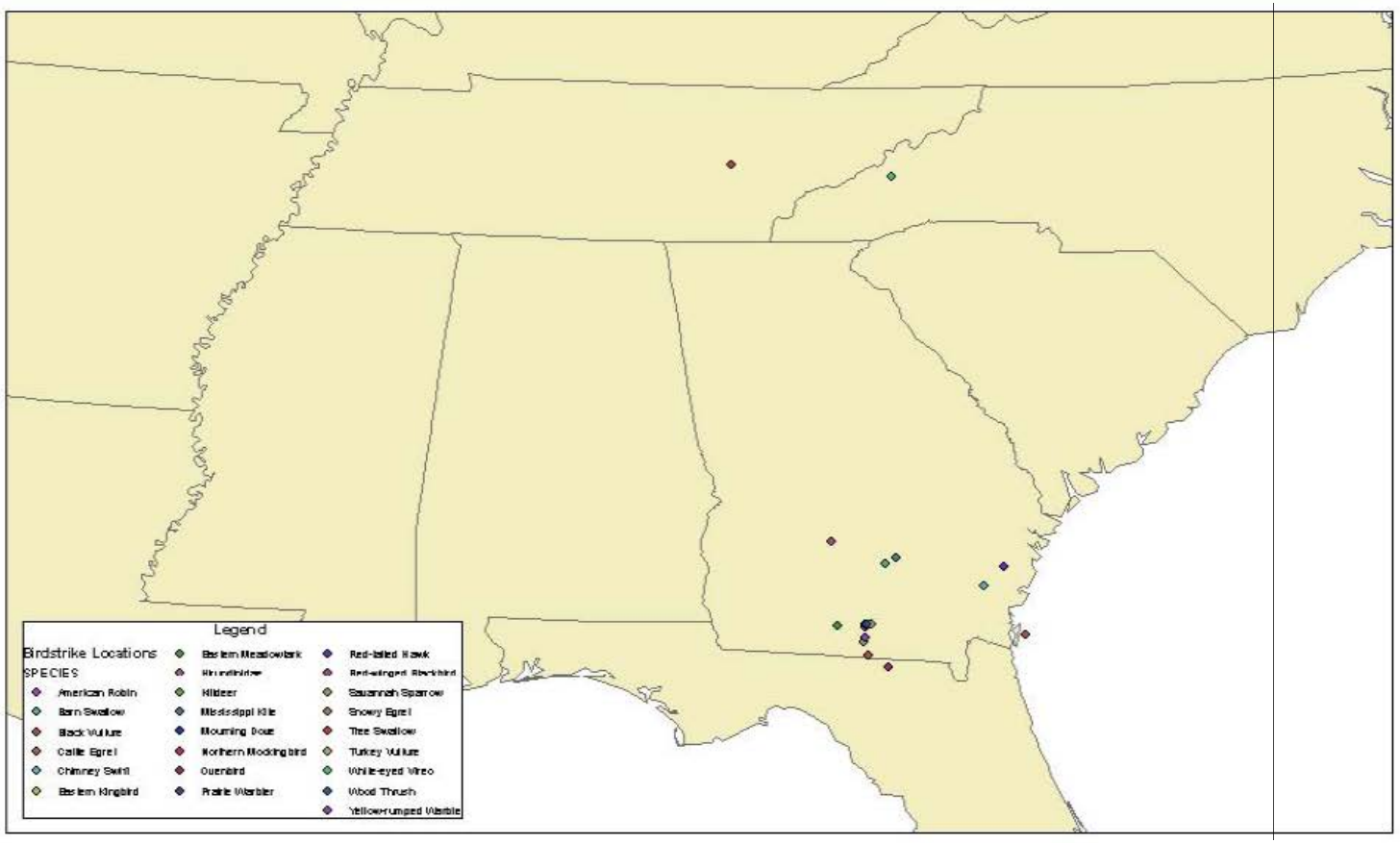
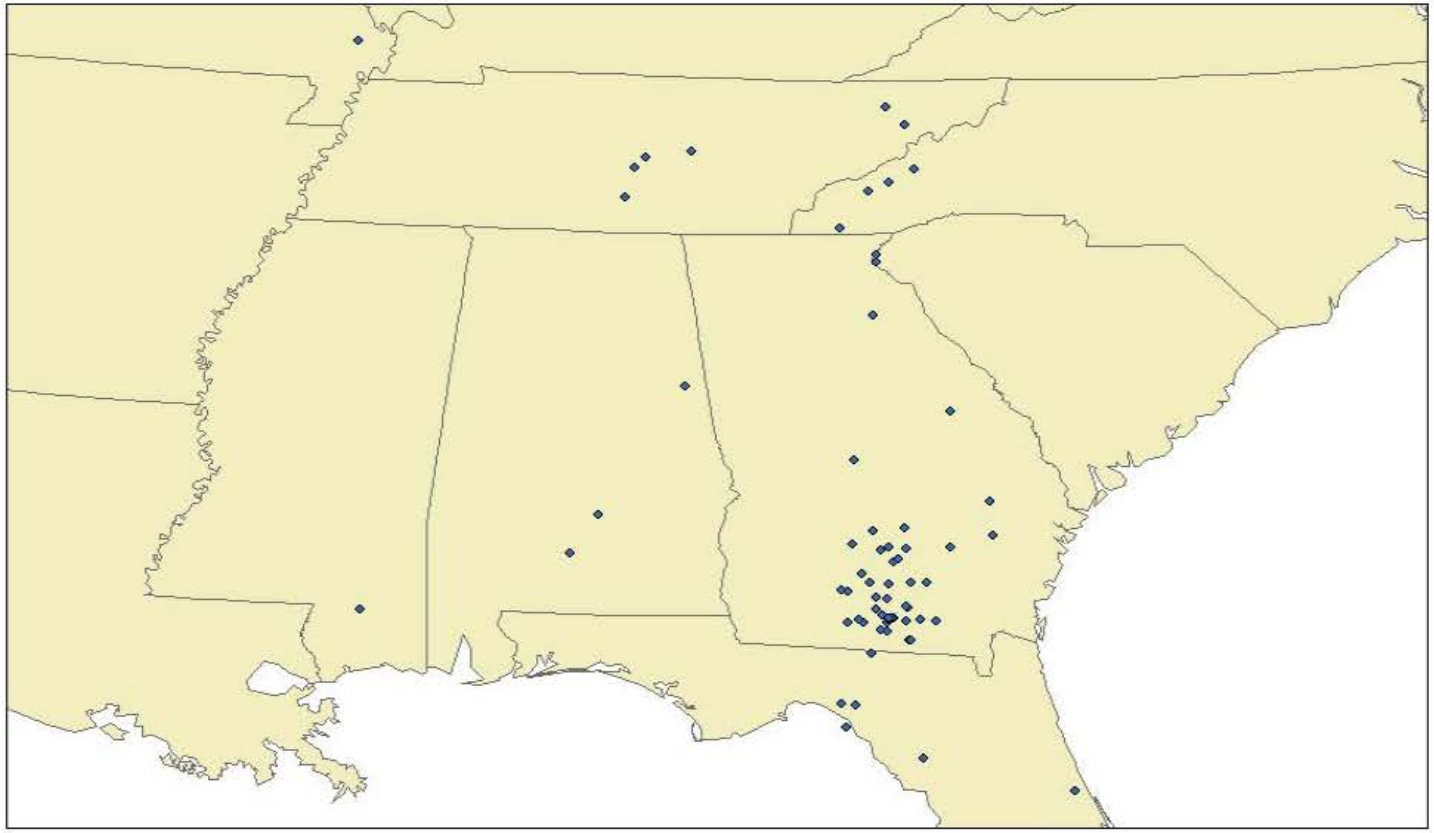

Legend
Number of Strikes
1
2
3
8
31
Geographic Distribution of Known Birdstrike Locations
Involving Moody AFB Aircraft
1990-2003

Figure 3



Known Avian Species Involved in Birdstrikes
With Moody AFB Aircraft
1990-2003

Figure 4



Birdstrikes Involving Unidentified Avian Species
Moody AFB Aircraft
1990-2003

Figure 5

Birds are a continuous threat to aircraft for the simple fact that they are highly mobile and often prefer the habitat represented by an airfield. With this in mind and following the basic laws of physics that no two items can occupy the same space at the same time, proactive management should be taken in order to reduce these threats. Proactive management strives to prevent catastrophic strikes before they happen rather than waiting to react after a pilot is killed or an aircraft is destroyed. An example where proactive management would have saved lives was in September, 1995. An USAF Airborne Warning and Control System (AWAC) aircraft crashed immediately after take-off at Elmendorf Air Force Base, Alaska, killing all 24 personnel on board (USDA, 1998). The plane struck a flock of Canada geese (*Branta canadensis*) that had been seen on a field adjacent to the airfield by an air traffic controller; unfortunately, neither the aircrew nor the Airfield Management office was notified so proactive actions could be taken to minimize the risk. If a functional BASH management plan had been in place and these birds had been dispersed prior to the AWAC aircraft take-off, there is a good potential that the strikes would not have occurred and the 24 personnel would not have been killed.

There are two main factors that influence the risk or potential for damage from a bird-aircraft strike: 1) the probability of a strike relative to the number of aircraft or birds in the operating environment; and, 2) the mass (size) of the bird involved in the strike. The risk of a bird-aircraft strike increases with bird occurrence within the aircraft operating environment, especially on the airfield or near the approach and departure paths (USAF, 2001; USAF, 2002). In other words, the more time spent at altitudes commonly frequented by birds, the greater the chance of a bird-aircraft encounter. Seventy-one percent of bird strikes occur below 500 feet altitude above the ground (AGL) (Cleary et al., 2000), which is essentially during takeoff and landing. While the location of most strikes involving Moody AFB aircraft is unknown, the majority of known strikes occur during low-level flights. Figures 6-9 show a breakdown of strikes based on phase of flight for Moody AFB aircraft, including the training aircraft (T-6A and T-38) and the search and rescue aircraft (HH-60G helicopter and HC-130).

In 2000, Moody AFB acquired two new missions involving the introduction of two training aircraft. The Initial Fighter Fundamentals (IFF) course mission introduced the T-38 Talon, a twin-engine, high-altitude, supersonic jet trainer. The Joint Primary Aircraft Training System (JPATS) mission introduced the T-6A Texan II, a single-engine, stepped tandem, two-seat primary trainer aircraft. As a result of the addition of two training missions to Moody AFB, there has been a significant increase in overall numbers of low-level flights and an increase in inexperienced pilots. Additionally, both training missions require a significant amount of training time be spent practicing takeoffs/landings or performing touch-and-go's at altitudes of less than 500 feet. Therefore, the risk of a catastrophic bird strike has increased, as evidenced by fact that approximately $115,000 in damage to training aircraft has occurred since April 2001. One of these incidents

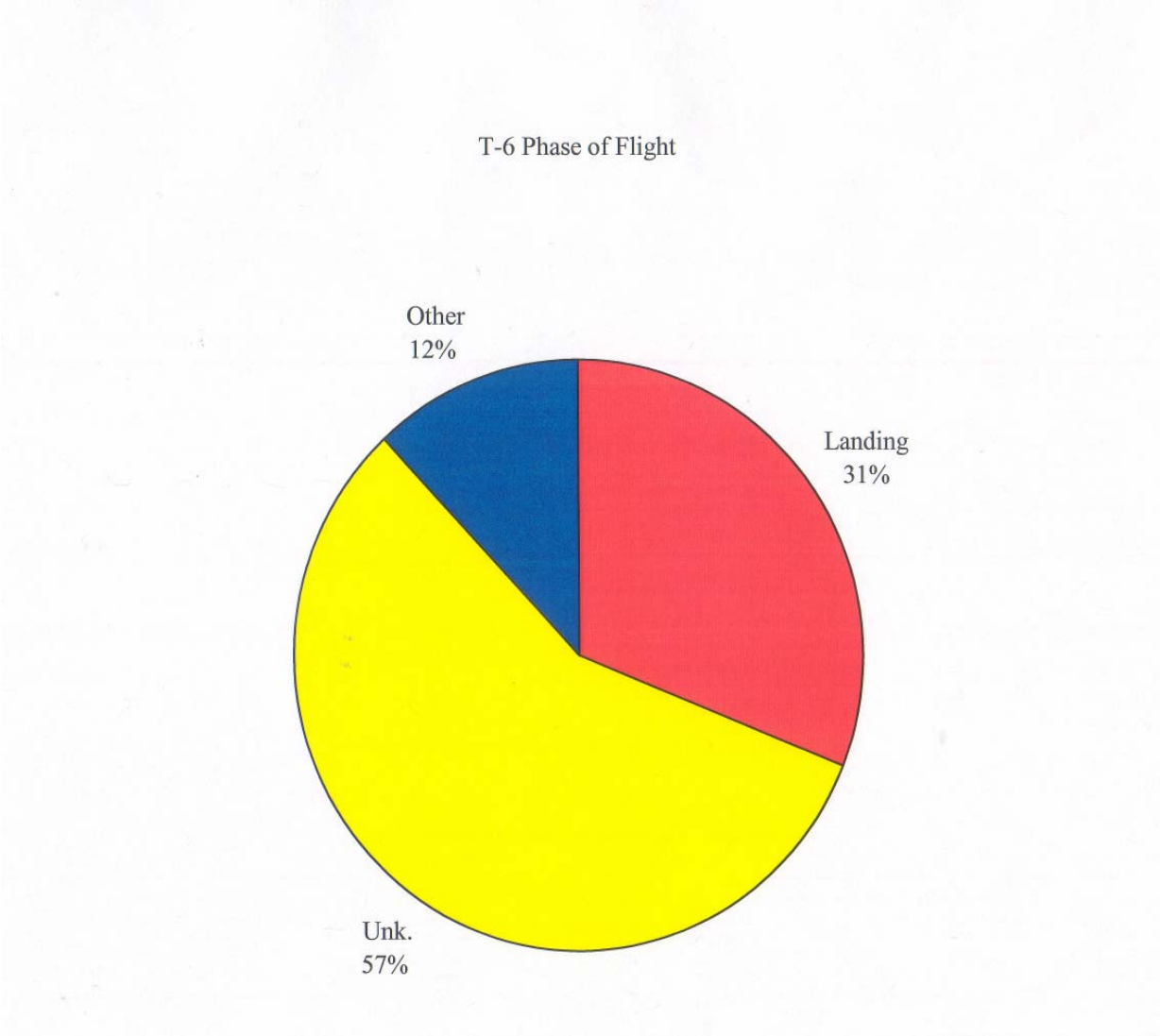


Figure 6

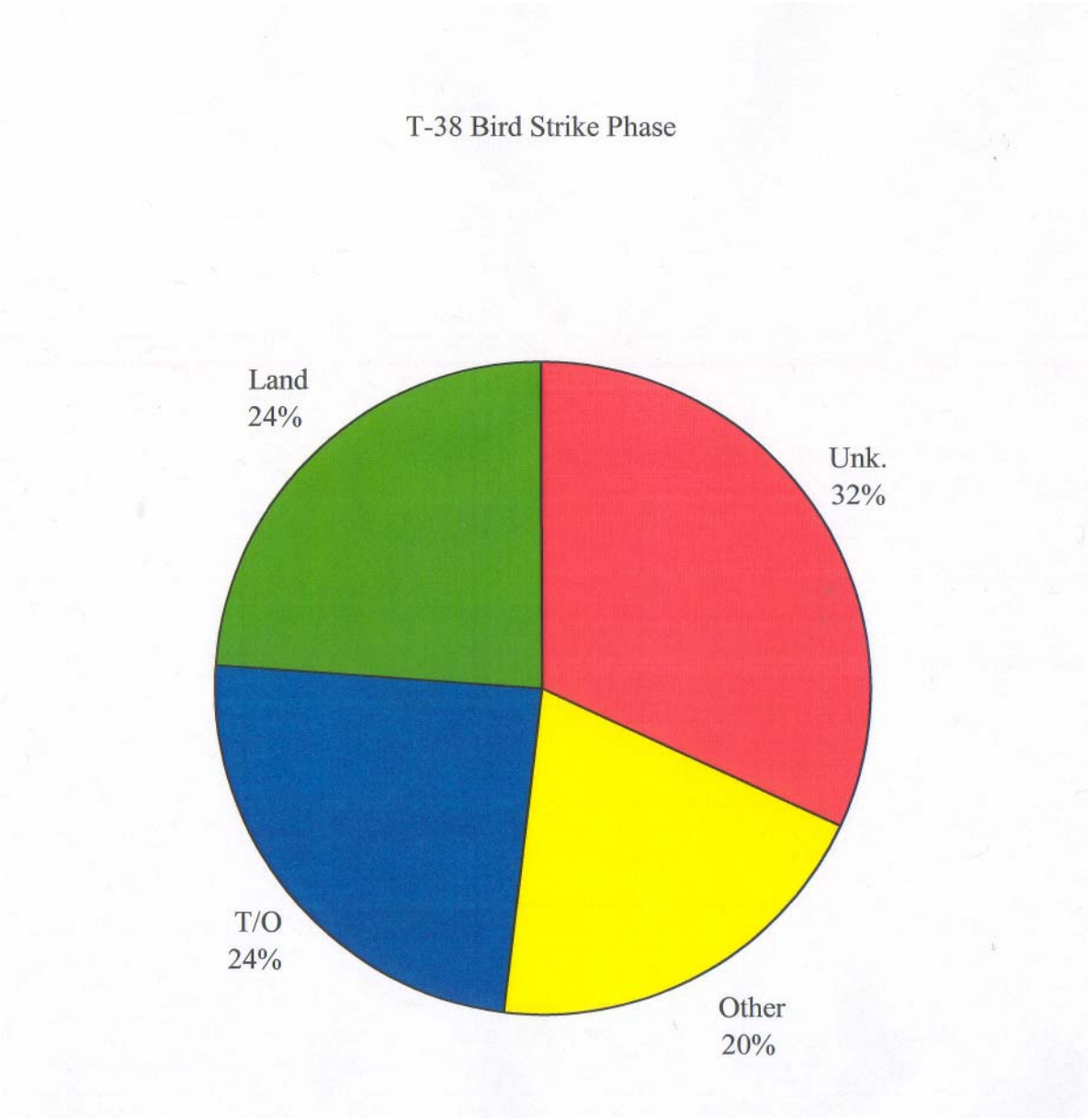


Figure 7

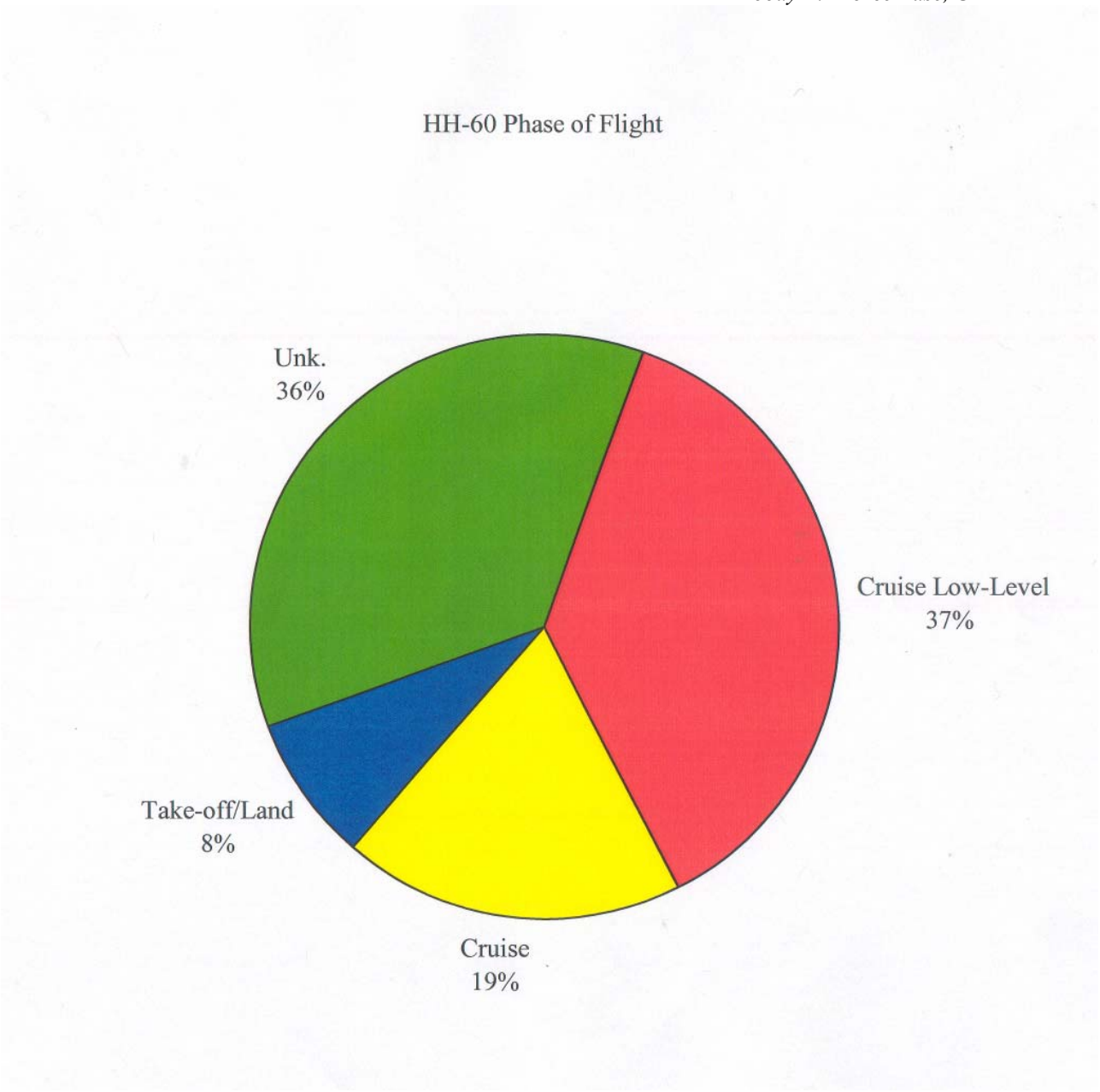

HH-60 Phase of Flight
Unk.
36%
Cruise Low-Level
37%
Take-off/Land
8%
Cruise
19%

Figure 8

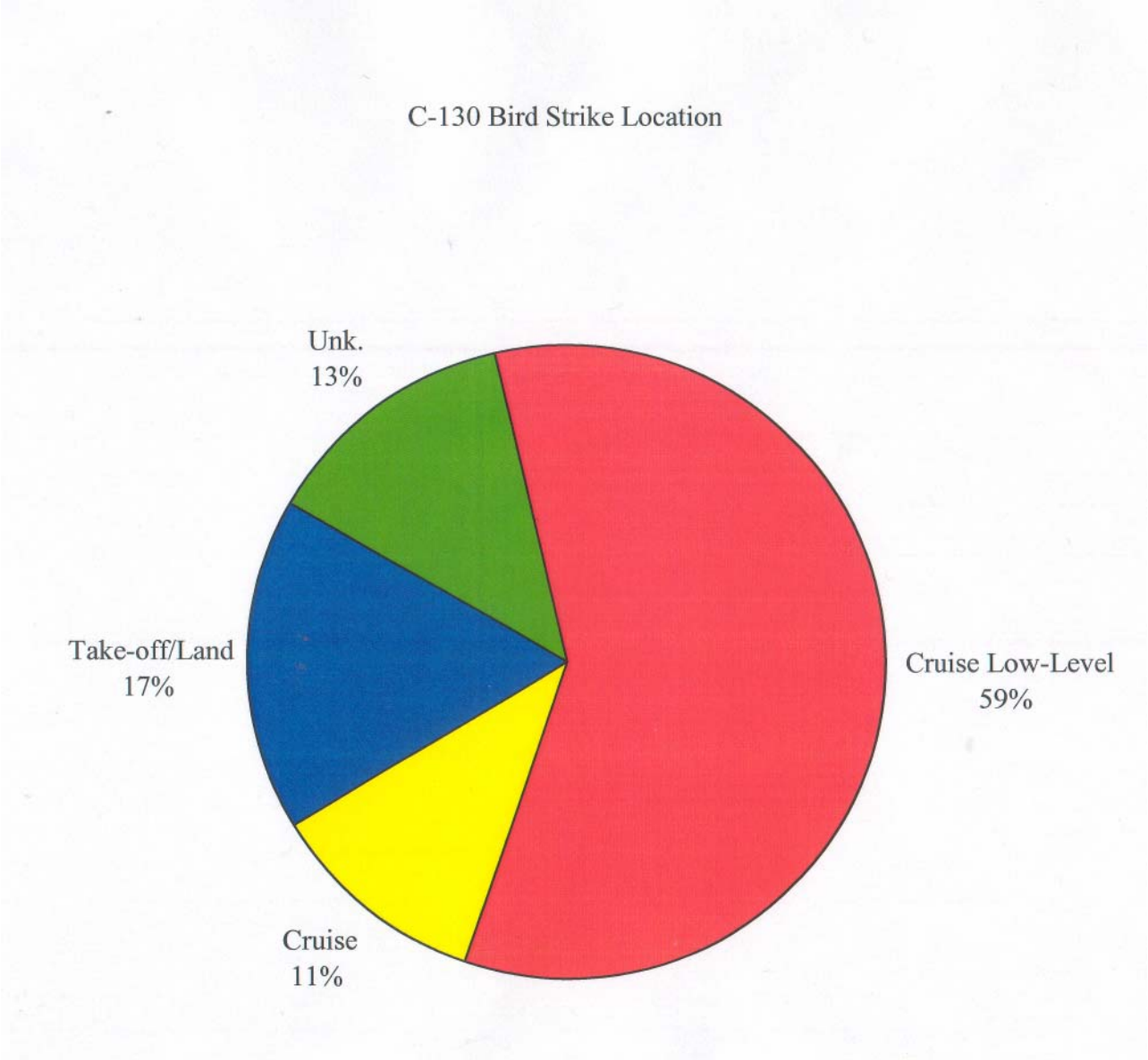

C-130 Bird Strike Location
Unk.
13%
Take-off/Land
17%
Cruise Low-Level
59%
Cruise
11%

Figure 9

would have resulted in the total loss of an aircraft if the plane had been flying five knots slower when the strike occurred. In this incident, which occurrred at 11:00 am on April 18th, 2001, an AT-38B fighter trainer aircraft was on final landing approach to Runway 36R on Moody AFB. Just before the plane made it to the paved overrun at the end of the runway, a great blue heron flew into the path of the plane and was ingested into the left engine of the aircraft. Fortunately, the pilot did not have to eject and was able to safely land the damaged aircraft following emergency engine shut-down. This single incident resulted in about $49,000 in damage to the aircraft. It is obvious that changes to the military mission at Moody AFB have increased the risk to pilots and aircraft operating in the Moody AFB airfield environment. Because of the increased risk to pilots resulting from the mission changes, there is a need for a comprehensive proactive BASH management program that seeks to reduce risk to pilots and aircraft both inside and outside the installation boundaries.

The proposed action, as described in Section 3.2 below, is designed to reduce the risk associated with the largest birds of concern in the Moody AFB environment, namely, vultures (black and turkey) and cattle egrets. These birds, especially the black vulture and cattle egret, congregate seasonally in large numbers on or near the flight path for Moody AFB aircraft. Additionally, they possess such great body mass that a direct hit with any of the three species could result in a catastrophic event, including the total destruction of an aircraft or the death of a pilot. The smaller passerines that are more often struck and the much larger sandhill cranes would be of concern only when they congregate in large numbers, such as during migration, and procedures are in place to minimize flying activities during periods of peak migration. Other large birds, such as red-tailed hawks, red-shouldered hawks, great egrets, little blue herons, white ibis, and great blue herons generally do not congregate in large numbers (except during migration) and have different foraging patterns than vultures and cattle egrets. These differences make the risk of a catastrophic event with these species much less likely than the probability of a strike with vultures or cattle egrets. Additional information on the three species of concern (black vultures, turkey vultures, and cattle egrets), including historical strike information pertinent to Moody AFB aircraft, is provided at 1.3.4. below.

1.3.4. Primary Birds of Concern

Vultures

Both turkey and black vultures are year-round residents in southern Georgia. However, vulture populations vary throughout the year as a result of migration and overwintering. According to population estimates provided by the Georgia Department of Natural Resources (DNR), local vulture populations in the Grand Bay Wildlife Management Area (WMA) south of Moody AFB consist of about 200-300 individuals. During the fall migration period, this population increases steadily until peak numbers of about 600-800 birds are reached.

As part of the development of a Bird Avoidance Model (USAF, 1998) for Moody AFB, USAF contractors tracked vulture movements throughout the Moody AFB environment through the use of radio telemetry and surveillance, vertical and conical scan radars. Based on information from this study and from information provided by the Georgia DNR, it was determined that vultures generally roost in tall trees at Grand Bay WMA at night and begin their flight activity one to two hours after sunrise. According to the Moody AFB study, the majority of vulture flights, both black and turkey, occur at low elevations (<500 feet above ground level (AGL)) during the morning, but increase in elevation after the development of thermal currents. Large concentrations (kettles) of vultures with up to 50 individuals are frequently observed during the winter, soaring over the south end of the airfield at heights up to 20,000 ft AGL. During approaches and departures to the runway, Moody AFB aircraft operate at the same elevations as these birds.

Vultures are the second most hazardous bird for aircraft to strike (Dolbeer et al., 2000). Dolbeer et al. (2000) determined the relative hazard of wildlife to aircraft based on the percentage of strikes causing damage (vultures = 67%), affecting flight (vultures = 40%), and the number of reports estimating damage. The impact resistance of current and future generations of aircraft canopies cannot prevent penetration by species the size of a vulture. Additionally, impacts by vultures will nearly always cause significant damage to an aircraft airframe and/or engine (USAF, 1998). The military has recorded several cases of catastrophic strikes involving vultures. In one instance, a F-16C struck a turkey vulture while on a low level flight and the bird penetrated the canopy. The pilot was forced to eject from the damaged aircraft and the plane crashed, resulting in a total loss (Merritt, 1989). In 1986, an F-4 from Moody AFB struck a vulture while on a low level route, killing the pilot. Since 1990, there have been 15 reported aircraft-vulture strikes at Moody AFB. The majority of these strikes (73%) have involved turkey vultures, which leads to the conclusion that there is a greater risk of turkey vulture-aircraft interactions than black vulture-aircraft interactions. This difference, which has not been scientifically substantiated, may be a result of differences in foraging and flying habits (see 2.2.1 below). Because of the frequency of strikes involving vulture, it is understood that vultures, especially turkey vultures, are a safety concern for military pilots flying at low levels around the Moody AFB environs.

Cattle Egrets

The ubiquitous cattle egret is a non-native species that became introduced (probably non-anthropogenically) into south Florida in the 1800's and quickly spread throughout the country. Cattle egrets now outnumber the combined populations of all native herons and egrets in North America (Ivory, 2000), and can be considered a part of the normally occurring avifauna within the ROI. Cattle egrets nest and roost immediately south of Moody AFB in the Grand Bay WMA and are common in southern Georgia from late spring through early fall. Spring and summer sightings of over 2000 birds dispersing from their rookery in the Grand Bay WMA are not uncommon, and cattle egrets are commonly seen on the Moody AFB airfield during this same time period. Without

proactive dispersal actions as part of the installation BASH management program, cattle egret numbers on the airfield range up to 200 individuals (Whitesell, 1983).

Cattle egrets are commonly found in pastures and other grassy areas, where they feed on insects flushed from the grass by tractors, domestic animals, or themselves. Cattle egrets typically leave their rookery in Grand Bay WMA just after daylight and disperse to the west and the north in small flocks ranging from 2-30 birds. Egrets typically forage until mid-morning, return to the rookery, and then disperse again to forage in late afternoon. When young are present in the nests, foraging forays are shorter and more frequent. Most foraging and return flights occur at extremely low elevations (<250 feet AGL).

The impact resistance of all current generation canopies prevents penetration by a bird this size; however, cattle egrets are large enough to cause significant damage to any part of an aircraft's structure or engine (USAF, 1998). This species is most hazardous to aircraft under weak thermal conditions when birds are concentrated at low elevations (USAF, 1998). Historical records from Moody AFB indicate that cattle egrets have been considered a BASH hazard since before 1983 (USAF, 2001a). In 1996, there were five reported strikes involving cattle egrets and Moody AFB aircraft. However, there have been no reported strikes involving cattle egrets since that time, which may be attributable to the proactive on-base BASH management efforts. Even though strikes with Moody AFB aircraft are infrequent, the presence of a large cattle egret rookery within the ROI is of great concern and leads to increased risk for Moody AFB pilots and aircraft.

1.4 Decision to be Made

Based on the scope of this EA, the decisions to be made are:

- Should the proposed action be implemented by the USAF on private and public lands within a five-miles radius of Moody AFB to protect property, human health, and safety from bird damage, and

- Should the proposed action include the lethal control of black and turkey vultures within the boundaries of Moody AFB, and

- Should the proposed action include an increase in the number of cattle egrets authorized to be lethally controlled within the boundaries of Moody AFB?

- If not, should Moody AFB attempt to implement any of the alternatives as described in the EA?

- Would the proposed action or any of the analyzed alternatives have significant impacts on the quality of the human environment requiring preparation of an EIS?

Per 32 CFR 989, the decision-maker for this action is the Chairman of the Moody AFB Environmental Protection Committee (EPC).

1.5 Location of the Proposed Action

Moody AFB is located about 9 miles northeast of Valdosta, GA, in the south-central region of the state in Lowndes and Lanier counties. Refer to Figures 1 and 2 for the general location of Moody AFB. Moody AFB is bisected by two state highways, Bemiss Road (Georgia Highway 125) and the Lakeland Highway (Georgia Highway 221). The primary land ownership within a five-mile radius of Moody AFB is private, consisting of agriculture, timberland, and rural residential properties. Additionally, the Georgia DNR owns property immediately south of the installation (Grand Bay WMA), and the U.S. Fish and Wildlife Service (USFWS) owns property along the northeast boundary of the installation (Banks Lake National Wildlife Refuge (NWR)). Both the Georgia DNR and the USFWS properties are managed for multiple-use objectives, including wildlife conservation, endangered species protection, and outdoor recreation.

1.6 Associated Environmental Documents

USAF Moody AFB Bird-Aircraft Strike (BASH) Program EA. The USAF has completed an EA and Finding of No Significant Impact (FONSI) on the BASH management program at Moody AFB (USAF, 2001a). Pertinent information available in the EA has been incorporated by reference into this EA.

USAF Moody AFB Pest Management Program EA. The USAF has completed an EA and FONSI on the pest management program at Moody AFB (USAF, 2002). This EA includes information about bird species that may impact air base operations. Pertinent information available in the EA has been incorporated by reference into this EA.

APHIS ADC (Animal Damage Control) Programmatic EIS. USDA, Animal Plant Health Inspection Service, Wildlife Services (APHIS/WS) has issued a Final Environmental Impact Statement (FEIS) on the national APHIS/WS program (USDA, 1997). Pertinent information available in the FEIS has been incorporated by reference into this EA.

1.7 Applicable Regulatory Requirements

The command at Moody AFB has the responsibility to ensure that all projects comply with federal and state regulations as well as applicable Department of Defense (DOD) and Department of Air Force (AF) Regulations. In regards to the proposed action, the following regulations, at a minimum, apply: National Environmental Policy Act (NEPA) and the Air Force implementing regulations (32 CFR 989, *The Environmental Impact Analysis Process*), Endangered Species Act, Clean Water Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Fish and Wildlife Coordination Act,

Executive Order 11990 -- *Protection of Wetlands*, Executive Order 13112 -- *Invasive Species*, Air Force Instruction (AFI) 32-7064 (Integrated Natural Resources Management), AFPAM 91-212 (Bird Aircraft Strike Hazard Management Techniques), AFI 91-202 (US Air Force Mishap Prevention Program), AFI 91-204 (Safety Investigations and Reports), and 347 WG Plan 91-202 (Bird Aircraft Strike Hazard Plan, Moody AFB, GA).

1.8 Non-applicable Regulations

During the initial scoping process, the following regulations were identified as possibly applying to the proposed action. However, an analysis of the intent of these regulations in relation to the predicted environmental effects of the proposed action and alternatives resulted in the determination that these regulations were not applicable to this action.

1.8.1 National Historic Preservation Act (NHPA) of 1966, as amended

The National Historic Preservation Act (NHPA) of 1966, and its implementing regulations (36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian Tribes to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings. The activities as described under the proposed action would not cause ground disturbances nor would they otherwise have the potential to significantly affect visual, audible, or atmospheric elements of historic properties and are thus not undertakings as defined by the NHPA. Moody AFB has determined that BASH management program actions are not undertakings as defined by the NHPA because such actions do not have the potential to result in changes in the character or use of historic properties.

1.8.2 Executive Order 12898 -- *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*

Executive Order 12898, entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Environmental justice is the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Executive Order 12898 requires Federal agencies to make environmental justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. It is not anticipated

that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations since only legal, effective, and environmentally safe wildlife damage management methods, tools, and approaches would be used. Additionally, neither Lanier nor Lowndes counties are considered areas of concentrated minority population or poverty areas as defined by the U.S. Census Bureau (USCB, 2001; 1995).

1.8.3 Executive Order 13045 -- *Protection of Children from Environmental Health and Safety Risks*

Children may suffer disproportionately from environmental health and safety risks for many reasons. Bird damage management activities, as proposed in this EA, would only involve legally available and approved damage management methods in situations or under circumstances where it is highly unlikely that children would be adversely affected. Therefore, implementation of the proposed action would not increase environmental health or safety risks to children.

2.0 ISSUES AND CONCERNS

This section contains a discussion of the issues and concerns related to implementation of the proposed action and alternatives. The environmental impacts associated with these issues and concerns will be evaluated in this document.

2.1 Affected Environment

The affected area or Region of Influence (ROI) includes all private and public lands located within a 5-mile radius of Moody AFB. Moody AFB is located in Lowndes and Lanier counties in south-central Georgia. Nearby cities include Valdosta, about 9 miles to the southwest, and Lakeland, about 6 miles to the northeast. The primary land ownership around Moody AFB is private, consisting of agriculture, timberland, and rural residential properties. As indicated in 1.5 above, the Georgia DNR owns property immediately south of the installation, and the USFWS owns property along the northeast boundary of the installation. Both the Georgia DNR and the USFWS properties are managed for multiple-use objectives, including wildlife conservation, endangered species protection, and outdoor recreation.

Habitat features within the affected area are dominated by the Grand Bay-Banks Lake ecosystem, a series of interconnected Carolina bays characterized by pine flatwoods, cypress domes, scrub-shrub swamps, black gum/maple swamps, shallow ponds, and wetland depressions. The remaining habitat features consist of natural and planted upland pines, mixed hardwood forests, agricultural land (pasture and row crop), and rural residential areas, including several small subdivisions and mobile home parks. Additional habitat information for Moody AFB is available in the Moody AFB Integrated Natural Resources Management Plan (USAF, 2001b) and in the EA entitled, "Bird-Aircraft Strike Hazard (BASH) Program at Moody AFB" (USAF, 2001a); these documents are available for review in the offices of the Environmental Flight, Moody AFB. Figures 3 and 4 show the proposed project area, including major landholders.

None of the analyzed alternatives would have adverse impacts to areas of critical environmental concern, prime or unique farmlands, coastal zones, wilderness areas, flood plains, wild or scenic rivers, hazardous waste or contaminated sites (including Environmental Restoration Program (ERP) sites), critical habitat for endangered species, archaeological remains, historic sites, or sites of Native American religious concern.

2.2 Issues and Concerns Addressed in the Analysis of Alternatives

2.2.1 Effects on Target Bird Species Populations

A common concern among members of the public is whether wildlife damage management actions adversely affect the viability of target bird species populations. The target species selected for analysis in this EA are black vultures, turkey vultures, and

cattle egrets. A minimal number of individuals are likely to be killed by the proposed action in any one year.

Biology and ecology of vultures and cattle egrets

Turkey and Black Vultures

Turkey vultures are large dark brown birds with wing spans up to six feet and a weight of about four pounds. Turkey vultures can be distinguished from other vultures by the adult's bright red head, the leading edge on the underside of the wing being black while the trailing edge is gray, and the long tail extending well beyond the body when in flight (Peterson, 1980). Turkey vultures have been reported to live up to16 years of age (Henny, 1990). In contrast, black vultures have less than a five foot wing span and average 4.6 pounds in weight (Peterson, 1980). Adult and juvenile black vultures have dark grey heads, the body is black, the underside of the wings are dark grey to blackish with white splotches at the end of the wing, and the tail is relatively short (Peterson, 1980). Black vultures have been reported to live to 25 years of age (Henny, 1990). The mode of flight between black and turkey vultures differ due to different wing lengths supporting about the same body weight (Rabenhold and Decker, 1989). Turkey vultures flap the wings a few times and glide when at low altitudes, whereas black vultures must flap constantly interspersed with brief glides when at low altitudes unless a strong wind blows. At high altitudes both vultures fly primarily by gliding and riding thermal wind currents. Overall, black vultures typically forage at higher altitudes than turkey vultures (Heintzelman, 2002).

Neither the black nor turkey vulture construct nests. Eggs are typically laid on the ground in upland locations such as under a brush pile, in a thicket, or under or in a log (Heintzelman, 2002). In coastal Georgia, turkey vulture nests have been located underneath saw palmetto (*Serenoa repens*) thickets within a mixed pine/hardwood forest (Lee, personal communication). Black and turkey vultures generally lay 2 eggs, which are incubated for approximately 40 days (McHargue, 1981). The young are fed and cared for by the adults for two to three months before fledging (Jackson, 1983). A post fledgling dependency period where adults lead young to food may exist for vultures (Jackson, 1983; Rabenhold, 1987). It is believed that vultures nest annually.

Turkey and black vultures are obligate scavengers (Rea, 1983; Coleman and Fraser, 1987). Their diet typically consists of carrion, fish, and invertebrates (Rea, 1983; Coleman and Fraser, 1987; Rabenhold, 1987). Black vultures have been documented to predate other animals, however, these isolated incidents may reflect aberrant behavior and may not be indicative of the general foraging habits of the species as a whole (Roads, 1936; McIhenny, 1939; Sprunt,1946; Lovell, 1947; Lovell, 1952; Parmalee, 1954; Mrovsovsky, 1971; Lowney, 1999). Turkey vultures occurred equally frequently at carcasses of all sizes, but black vultures primarily feed on large carcasses (>5 kg) (Buckley, 1996). At very large carcasses (i.e., those greater than 100 kg), black vultures always outnumbered turkey vultures during studies conducted in Texas (Buckley, 1996).

Black vultures apparently forage by visually looking for carrion, other food items, and congregations of other vultures and not by olfactory clues (Heintzelman, 2002). For this reason, greater numbers of black vultures are typically observed feeding on carcasses at the same time than turkey vultures. Turkey vultures, on the other hand, appear to be more solitary in foraging, and rely both on visual and olfactory clues to locate food (Stager, 1964; Snyder and Snyder, 1991). Studies conducted in Texas indicate that turkey vultures were able to locate hidden carrion while black vultures could not (Snyder and Snyder, 1991). Turkey vultures are documented to locate carcasses first, but they are often displaced by the later-arriving black vultures (Buckley, 1996).

Vultures roost in communal roosts, especially during late fall through early spring since this behavior enhances the ability to find food. Roosts may number as few as 15 birds to over 1,000 (Prather et al., 1976). Winter roosts in southern Pennsylvania, northern Maryland, and northeastern Virginia were characterized by large conifers (>56 centimeters diameter measured at 4.5 feet above the ground (dbh) and >21 meters tall) near habitat features that contribute to air currents (Thompson et al., 1990; Wright et al., 1986). Presumably, these winter roost sites were selected to maximize thermoregulation during the colder northern winters. The roosting locations within the ROI at Moody AFB are characterized by tall trees, primarily cypress, blackgum, and maple, existing in a Carolina bay. Literature suggests that turkey vultures leave the roost earlier in the morning than black vultures (Wright et al., 1986). Studies are currently underway within the ROI to determine differences in roosting and foraging behavior between black and turkey vultures.

In North America, black vultures occur in the southeastern United States, Texas, Mexico, and parts of Arizona (Wilbur, 1983). Black vultures have been expanding their range northward in the eastern United States (Wilbur, 1983; Rabenhold and Decker, 1989). Black vultures are considered locally resident (Parmalee and Parmalee, 1967; Raben and Decker, 1989); however, some populations will migrate (Eisenmann, 1963 cited from Wilbur, 1983). Turkey vultures occur in all of Mexico, most of the United States, and in the southern tier of Canada (Wilbur, 1983; Rabenhold and Decker, 1989). Northern populations of turkey vultures migrate from summer to more southern wintering areas (Stewart, 1977). Because the number of vultures utilizing the roost at Grand Bay WMA increases during the winter, it is assumed that the majority of the birds present during the winter are northern migrants. Studies are currently underway within the ROI to determine migration dynamics within the system (e.g. extent of migration and source of migrants). Vultures have very large home ranges. Studies in southern Pennsylvania and northern Maryland reported mean home ranges of 36,771 acres and 91,606 acres for black vultures and turkey vultures, respectively (Coleman and Fraser, 1989). The home range for vultures in south Georgia is currently unknown.

Two commonly used surveys to track bird population trends are the Breeding Bird Survey, administered by the U.S. Fish and Wildlife Service in spring and summer, and

the Christmas Bird Count, administered by the Audubon Society in early winter. Breeding Bird Survey trend data from 1966-2000 indicate that turkey vulture populations have been increasing throughout the United States, the southeast region, and Georgia (Sauer et al., 2001). However, there are no significant trends reported for black vultures during this same time period. Buckley (1999) cites several studies that indicate that black vulture populations declined in the southeastern U.S. during the 1970's and 1980's, especially in Georgia and the Carolinas. One detailed study in North Carolina documented a significant decline in breeding success between 1980 and 1990, probably due to a loss of nesting sites (Buckley, 1999). Christmas Bird Count data from 1959-1988 shows a slight decline in Georgia for black vultures and an increasing trend in turkey vultures for Georgia (Sauer, 1996). However, as Bergstrom (2002, personal communication) points out, CBC data are useful for describing geographic distributions of birds in early winter, but they are not designed to allow accurate inference of population trends. According to Moody AFB wildlife sighting reports and conversations with the Georgia DNR, both black vulture and turkey vulture populations within the ROI seem to be increasing, especially the over-wintering population using the Grand Bay-Banks Lake ecosystem for roosting; however, actual quantifiable data on population levels are lacking for the ROI. Studies are currently being conducted in the ROI by the AF to determine the status of the population.

Cattle Egrets

Cattle egrets are an all white bird with orange-buff plumes on the crown of their heads during the spring and summer breeding season. During the non-breeding season, both sexes of cattle egret are white with yellow bill and legs. They are a medium-sized bird measuring between 19 and 21 inches in length with a wing span of between 36 and 38 inches and weighing up to 12 ounces (Terres, 1991).

Cattle egrets are an immigrant from the Old World and are now established in the United States (Terres, 1991). As a result of increasing deforestation and increasing cattle farming, the range of the cattle egret has increased, moving north and west from its introduction points in Florida and Texas. Cattle egrets are not federally or state listed as rare, threatened, or endangered.

Cattle egrets are commonly found in pastures and other grassy areas, where they feed on insects flushed from the grass by tractors, domestic animals, or themselves. They typically feed on insects and small vertebrate animals disturbed by cattle or horses or found in recently mowed fields. Cattle egrets are often seen perching on the backs of cattle and horses (Whitesell, 1986; Terres, 1991). At Moody AFB, cattle egrets are frequent visitors to the airfield, where they follow mowers and other equipment in flocks of up to 200 birds. Based on Moody AFB surveys, cattle egrets typically leave their rookery in Grand Bay WMA just after daylight and disperse to the west and the north in small flocks ranging from 2-30 birds. Egrets typically forage until mid-morning, return to the rookery, and then disperse again to forage in late afternoon. When young are

present in the nests, foraging forays are shorter and more frequent. Most foraging and return flights occur at extremely low elevations (<250 feet AGL).

Cattle egrets are communal nesters, and are either found in single species rookeries or mixed with other herons and egrets (Terres, 1991). Cattle egrets are known to nest in the state of Georgia (Scott, 1996; Sauer et al., 2001); there is currently a large cattle egret rookery located south of Moody AFB in the Grand Bay Wildlife Management Area (WMA) (Hon, personal communication). Cattle egrets can aggressively dominate portions of a rookery, increasing levels of interspecific competition with other nesting herons, egrets, and waterfowl (e.g., tri-colored herons, anhingas, snowy egrets, etc.) and reducing the diversity of birds utilizing the rookery (Hon, personal communication). As a result of their aggressive nature, cattle egrets have reportedly prevented white ibis and other birds in communal rookeries from renesting (USAF, 1998). Nests are made of twigs and branches and are typically located 5 to 12 feet above the ground in trees and shrubs. Cattle egrets typically nest from April through May with clutch sizes of 2 to 6 eggs. The incubation period for cattle egrets is 21 to 24 days (Terres, 1991).

Breeding Bird Survey trend data from 1966-2000 indicate that cattle egrets have been stable to slightly increasing throughout the United States, the southeast region, and Georgia (Sauer et al., 2001). This species is not reported from Christmas Bird Counts because it migrates to more southern regions during the winter. Cattle egrets normally emigrate into the Moody AFB area in early spring (April) and immigrate out of south Georgia by mid- to late October, depending on weather conditions and other environmental factors.

2.2.2 Effects on Non-target Species Populations, including Rare, Threatened, and Endangered (RTE) Species

A common concern among members of the public and wildlife professionals, including USAF personnel, is the impact of damage control methods and activities on non-target species, particularly RTE species. A list of potentially occurring RTE species within the proposed project area was obtained from the USFWS, the Georgia DNR, and surveys conducted at Moody AFB. This list is presented in Table 2-1.

2.2.3 Effects on Damage to Property from Bird Strikes

A major concern of the USAF is the economic impact of bird damage to aircraft and other property. As noted in 1.3.3, Justification for Proposed Action, birds have been documented to cause catastrophic losses to aircraft and other property as a result of strikes. The USAF is concerned as to whether the proposed action or any of the alternatives would reduce such damage to more acceptable levels.

2.2.4 Effects on Human Health and Safety

The proposed action includes the use of firearms, traps, and pyrotechnic scaring devices in addition to other techniques and tactics. Concerns have been raised that the use of these items could result in injuries to humans. Additionally, concerns have been raised that the use of pyrotechnics could result in wildfires that have the potential to harm humans.

A major concern of the USAF is the risk of personnel injury and/or death as a result of bird and wildlife strikes with aircraft. As noted in 1.3.3, Justification for Proposed Action, birds have been documented to cause catastrophic losses to aircraft and other property as a result of strikes, and several strikes have resulted in injury and death. The USAF is concerned as to whether the proposed action or any of the alternatives would reduce such damage to more acceptable levels.

The concern stated here is that the absence of an adequate BDM plan would result in adverse effects on human health and safety, because bird strikes on aircraft would not be curtailed or reduced to the minimum levels possible and practical. The potential impacts of not conducting such work could lead to increased incidence of injuries or loss of human lives from bird strikes to aircraft.

2.2.5 Effects on Human Affectionate-Bonds with Individual Animals and on Aesthetic Values of Wildlife Species

Wildlife populations provide a range of social and economic benefits to humans (Decker and Goff, 1987). These include direct benefits related to consumptive and non-consumptive use (e.g., wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (e.g., reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to the stability of natural ecosystems (e.g., ecological, existence, bequest values) (Bishop, 1987). Included in this range of social and economic benefits are aesthetic values related to the appreciation of the beauty of nature and human affectionate-bonds with wild animals.

Table 2-1 RTE Species from Lowndes and Lanier Counties, Georgia

Class	Common Name	Scientific Name	Federal Status[a]	State Status[b]
Plants	Green-fly Orchid	*Epidendrum conopseum*	None	U
	Hooded Pitcher Plant	*Sarracenia minor*	None	U
Birds	Bachman's Sparrow	*Aimophila aestivalis*	None	R
	Wood Stork	*Mycteria americana*	E	E
	Southern Bald Eagle	*Haliaeetus leucocephalus leucocephalus*	T	E
Mammals	Round-tailed Muskrat	*Neofiber alleni*	None	T
Reptiles	American Alligator	*Alligator mississippiensis*	T (S/A)	None
	Eastern Indigo Snake	*Drymarchon corais couperi*	T	T
	Gopher Tortoise	*Gopherus polyphemus*	None	T
	Alligator Snapping Turtle	*Macroclemys temminckii*	None	T

[a]**FEDERAL STATUS**
E = Endangered. A species that may become extinct or disappear from a significant part of its range if not immediately protected
T = Threatened. A species that may become endangered if not protected.
S/A = Similarity of Appearance.

[b]**STATE STATUS**
E = Endangered. A species which is in danger of extinction throughout all or part of its range in Georgia.
T = Threatened. A species which is likely to become an endangered species in the foreseeable future throughout all or part of its range in Georgia.
R = Rare. A species which may not be endangered or threatened but which should be protected because of its scarcity.
U = Unusual. A species deserving of special consideration and plants subjected to commercial exploitation.

The benefit of aesthetics is difficult to quantify, because aesthetics are subjective and vary from person to person. In other words, what one person appreciates or finds beautiful about nature may or may not be the same as another person. For some people, just the fact that wildlife exists near them provides aesthetic benefits. Others experience aesthetics through direct observation of animals in their natural settings. On the other hand, the human attraction to animals, wild and domesticated, has been well documented throughout history. Because of our attraction to animals, a large percentage of households have pets and a large percentage of Americans participate in wildlife feeding and wildlife watching activities. Additionally, because some individual animals or groups of wildlife species habituate and learn to live in close proximity to humans, some people develop emotional bonds with them similar to those experienced by domestic animal owners.

Because of the numerous different philosophical, aesthetic and personal attitudes, values, and opinions about nature and wildlife, the views of the public about wildlife damage management and the best ways to manage wildlife/human conflict are not consistent. Some individuals who have been negatively affected by wildlife damage are more prone to support active wildlife damage management to reduce future conflicts, while some who have not been directly affected oppose any wildlife damage management activities. Concerns on both side of the spectrum are equally valid and should be respected and analyzed.

Specifically in regard to the proposed action and the alternatives, concerns have been raised that the implementation of these actions would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Of primary concern is the potential reduction in opportunities to view wildlife species in their natural habitat. The USAF recognizes the validity of this concern, and will address this issue in this environmental assessment.

2.2.6 Humaneness and Animal Welfare Concerns of Lethal Methods Used

The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if "the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."

Suffering is described as a highly unpleasant emotional response usually associated with pain and distress. However, as the AVMA (1987) points out, suffering can occur without pain and pain can occur without suffering (AVMA, 1987). Because the concept of suffering traditionally carries with it the implication of a time frame, a case could be made that there is little or no suffering in situations where death comes immediately (CDFG, 1991).

Defining pain as a component in humaneness of wildlife damage management methods appears to be a greater challenge than that of suffering. Pain obviously occurs in animals, as evidenced by altered physiology and behavior in those animals demonstrating a pain response. It has been theorized that the causes for pain in animals could be approximated by identifying the causes that elicit pain responses in humans (AVMA, 1987). However, scientific research into the phenomena of pain has shown varying ranges of pain when considered intraspecifically (among individuals of the same species) and interspecifically (differences between species) (CDFG, 1991).

Pain and suffering, as it relates to wildlife damage management methods, has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since neither medical nor veterinary curricula explicitly address suffering or its relief (CDFG, 1991).

Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering within the constraints imposed by current technology and funding.

Scientists have improved the selectivity and humaneness of management techniques through research and development, and research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some BDM methods are used in situations where non-lethal damage management methods are not practical or effective.

3.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

3.1 Minimum Selection Criteria

The Air Force considered several alternatives to the Proposed Action. In the initial screening of these alternatives, the Air Force took into consideration minimum selection criteria. Only those alternatives that met these criteria were considered suitable for detailed analysis. The selection criteria were: 1) conformance to existing laws and Air Combat Command (ACC), Department of Air Force (AF), and Department of Defense (DoD) policy; 2) techniques that have been scientifically proven to reduce the risk associated with cattle egrets and vultures; and, 3) techniques that were acceptable from a logistical and financial standpoint, including techniques that could reasonably be implemented on non-AF owned property.

3.2 Alternative 1 – Proposed Action

The proposed action primarily concerns the development and implementation of a BASH management program on private and public lands within a five-mile radius of Moody AFB (also referred to as the Region of Influence (ROI)) to protect property, human health, and human safety from risks associated with bird-aircraft strikes. However, this action also includes adding the turkey vulture and black vulture to the list of species authorized to be lethally controlled within the boundaries of the installation and increasing the number of cattle egrets authorized to be lethally controlled on the installation. Similar to the currently approved Moody AFB BASH management program, the proposed action involves an integrated approach to minimize the risk of bird-aircraft strikes, allowing the use of any legal technique or method, used singly or in combination, to obtain the desired result (i.e., minimize risk to property, human health, and human safety from birds). All activities proposed for implementation outside of the installation boundary would be contingent upon the permission of the landowner or manager and the acquisition of all appropriate legal and real estate documents, including Migratory Bird Treaty Act (MBTA) permits. All management activities would comply with appropriate federal, state, and local laws and regulations. Specific actions that could be implemented in an integrated approach are listed below in order of anticipated application. In other words, the proposed action involves the application of non-lethal techniques before the implementation of lethal strategies and techniques. However, any of the strategies or techniques listed below could be implemented under this action.

3.2.1 Non-lethal Strategies and Techniques

Prediction of Bird Occurrence in Airspace (Avoidance). Potential bird hazards are identified in advance in two main ways. Wildlife observations are taken daily during operating hours by Moody AFB personnel, including Airfield Management, Flying Safety, and the Environmental Flight. Additional information is obtained from off-base birders. Wildlife observation reports are analyzed by the Flying Safety Office to identify

trends and are reported at the quarterly Bird Hazard Working Group (BHWG) meeting for dissemination to the flying community. Additionally, as part of the Moody AFB BASH management program, Moody AFB has implemented the use of a site-specific Bird Avoidance Model (BAM) to identify potential bird hazards based on historical bird sightings from Moody AFB personnel, Breeding Bird Surveys (BBSs), and Christmas Bird Counts (CBCs) and from a two-year radar and telemetry study of vultures and sandhill cranes conducted at Moody AFB. The Moody AFB BAM provides risk information for the Moody AFB airspace forecast for two-week periods throughout the year for heights ranging from ground level to 8000 feet AGL. This model is used as the first line of defense by military pilots and schedulers to forecast potential hazards and to plan future flying activities.

While the Moody AFB BAM has proven to be an extremely useful tool it does not:

a. provide specific information on hazardous species such as Turkey Vultures and Red-tailed Hawks; these birds accounted for 27% of identified strikes and 53% of the risk (probability of damage) to aircraft flying low-level missions;

b. bring together data on the dynamic conditions that bring soaring birds into contact with aircraft, e.g., information on weather conditions is needed because weather is one of the key factors that creates the circumstances for strikes, e.g., the depth of thermals used by soaring vultures;

c. account for the fact that at any given time during the day or night and at all times throughout the year some species of bird is active. As a result, it is not possible to avoid all birds; the key is to be able to avoid the most hazardous species

To address this need, the Avian Hazard Advisory System (AHAS) was developed by the USAF BASH Team to extend the capacity of BAM. AHAS is designed to link BAM's historical data on bird activity, weather conditions and their relationships to bird activity, and strike rates for specific bird species. In addition, AHAS now incorporates data on bird activity gathered by Next-Generation Weather Radar (NEXRAD), making it possible to provide information on bird strike risk levels that can be updated every 20 to 35 minutes. Currently AHAS covers two-thirds of the lower 48 states. While still not real-time information, it does provide pilots and schedulers with better information that can be used to minimize risk to aircraft within the Moody AFB operating environment.

Forage Reduction. Forage reduction activities are currently implemented within the boundaries of Moody AFB, and will be continued as part of this action. Insects, the primary food item for cattle egrets, are controlled on the airfield through the use of pesticides applied through the Pest Management Program. Mowing frequency on the airfield has been reduced to remove additional attractants for cattle egrets. Carrion, the primary food item for both species of vultures, is removed from all installation roads and improved areas the same day it is discovered. Additionally, hunters are not allowed to field dress harvested animals, and must dispose of viscera off-base to keep vultures from

being attracted to the installation. Within the clear zone of the airfield, existing easements with private and state landowners have been enacted that restrict activities that might attract birds. One of these restrictions requires adjacent landowners to remove deceased livestock when discovered to prevent the attraction of vultures to the site.

Similar carrion-removal practices are carried out within the ROI by Lowndes County personnel. Dead animals are removed from the roads and rights-of-way and are disposed of in accordance with state regulations. Under the proposed action, verbal agreements similar to those existing in clear-zone easements will be sought with farmers and land owners within the ROI. These agreements will encourage farmers and land owners to quickly dispose of livestock carcasses in accordance with state regulations to reduce attractiveness to vultures.

Wildlife Dispersal Techniques (Harassment). Dispersal techniques would be employed to discourage vulture and cattle egret roosting within the proposed project area. These would primarily consist of a combination of bioacoustics, pyrotechnics, and propane gas cannons and visual dispersal (i.e. vehicle harassment; use of remote-controlled planes; use of mylar tape, lasers, eye-spot balloons, and effigies) by Moody AFB personnel (Harris and Davis, 1998; Loud, 2000). Bioacoustics consist of taped distress or alarm calls of birds designed to scare birds from roosts and other locations (Arhart, 1972; Rossbach, 1975; Shirota et al., 1983; Schmidt and Johnson, 1984; Mott 1985; Bomford, 1990; Cleary and Dolbeer, 1999). These may be broadcast from a vehicle or from a stationary object designed for this purpose. Pyrotechnics consist of 15-millimeter and 12-gauge scare cartridges that produce a secondary effect (explosion or whistle) to scare birds from the area. The scare cartridges are launched from either a shotgun or pyrotechnic pistol designed for this purpose. Approximately 300 rounds of 15-mm and 30 rounds of 12-gauge pyrotechnics would be fired monthly to disperse vultures and cattle egrets. Additionally, up to 25 propane gas cannons may be used to help disperse large concentrations of vultures and cattle egrets. These cannons would be periodically moved to discourage habituation and to target areas with higher concentrations of wildlife. Pyrotechnics would not be used within the state-owned portion of the Grand Bay Wildlife Management Area (WMA) to prevent disturbance to non-target species.

Since vultures do not respond well to pyrotechnics, remote-controlled planes may be used by trained personnel to harass these birds and to move them out of the project area. Remote-controlled planes would be flown directly toward the target bird to simulate an attack by a larger raptor. Studies at other airfields, including military airfields, have shown that remote-controlled planes can be used effectively to disperse vultures and other birds when used in conjunction with other BASH techniques. Visual techniques such as use of mylar tape (highly reflective surface produces flashes of light that startles birds), eye-spot balloons (the large eyes supposedly gives birds a visual cue that a large predator is present), flags, and effigies (scarecrows) sometimes are effective in reducing bird damage. Mylar tape has produced mixed results in its effectiveness to frighten birds

(Dolbeer et al., 1986; Tobin et al., 1998; Cleary and Dolbeer, 1999). Research has indicated that birds habituate quite quickly to visual scare tactics.

Vulture effigies can be used to disperse vulture roosts and protect property (Avery et al., 2002; Tilman et al., 2002). Effigies can be dead vultures, taxidermy vultures, or modified plastic goose decoys painted to resemble vultures (Humphrey et al., 2001; Avery et al., 2002; Tillman et al., 2002). Effigies are hung upside down as high as possible in roost trees or from specially constructed masts to disperse vultures (Humphrey et al., 2001; Tillman et al., 2002). In December 2001 through January 2002, vulture effigies were used effectively to disperse a 250-bird vulture roost near Eglin AFB, Florida. One taxidermic vulture effigy was suspended from a prominent tree within the 125-ha roost area, and was supplemented by the use of a laser. After 5 days, only 5 birds were observed in the roost; and 2 weeks later, no birds were using the roost (USDA, 2002). A migratory bird permit is required from the USFWS before a vulture may be taken to use as an effigy or to salvage a dead vulture (e.g., road killed bird) to use as an effigy. Vultures killed as part of this action may be used to create effigies for future use.

Lasers are a non-lethal technique recently evaluated by the USDA/APHIS/WS, National Wildlife Research Center (NWRC) to disperse double-crested cormorant roosts (Glahn et al., 2000). For best results and to disperse numerous birds from a roost, the laser is most effectively used in periods of low light, such as after sunset and before sunrise. In the daytime, the laser can also be used during overcast conditions or in shaded areas to move individual and small numbers of birds, although the effective range of the laser is much diminished. Moving the laser light through the tree branches rather than touching birds with the laser light elicited an avoidance response from cormorants (Glahn et al., 2000). During pen trials with lasers the cormorants were inconsistent in their response with some birds showing no response to the laser (Glahn et al., 2000). The lack of overt response by cormorants to lasers is not clearly understood, but suggests laser light is not a highly aversive agent (Glahn et al., 2000). Blackwell et al. (2002) tested lasers on several bird species and observed varied results among species. Lasers were ineffective at dispersing pigeons and mallard with birds habituating in approximately 5 minutes and 20 minutes, respectively (Blackwell et al., 2002). Canada geese reacted to the laser displaying neophobic avoidance to the approaching laser beam.

Vultures respond readily to lasers. In Florida, a roost of over 250 vultures in a residential neighborhood was dispersed after a laser was used there during 4 consecutive evenings. No habituation to the laser was noted. However, the birds returned 2 days later after laser harassment had ceased (M. Avery, NWRC, personal communication). At three other roosts, similar short-term responses were observed. It appears that lasers can provide short-term vulture control, but their long-term effectiveness remains to be determined.

Nest destruction. Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction is generally only applied when

dealing with a relatively small number of birds. Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high populations. Under the proposed action, nest destruction of cattle egret nests would occur in both established and new rookeries within the proposed project area. It is anticipated that up to 1,000 cattle egret nests (based on current, known nesting population levels near Moody AFB) may be destroyed annually as part of this action.

3.2.2 Lethal Strategies and Techniques

Based on current population levels and wildlife observation reports, it is anticipated that up to 10 black vultures, 20 turkey vultures, and 150 cattle egrets (currently authorized to take up to 50 cattle egrets annually -- action is to increase depredation by 100 on base) could be killed within the boundaries of Moody AFB annually through shooting or trapping and euthanasia. Additionally, up to 10 black vultures, 20 turkey vultures, and 250 cattle egrets could be killed within a five-mile radius on public and private lands surrounding Moody AFB annually through shooting or trapping and euthanasia. Therefore, the proposed action includes the potential depredation of no more than 20 black vultures, 40 turkey vultures, and 400 cattle egrets within the ROI. Depredation activities would take place year-round. It is anticipated that a maximum of 6,000 cattle egret eggs in approximately 1,000 nests (based on current, known nesting population levels near Moody AFB) would be prevented from hatching. The proposed lethal strategies and techniques that would be implemented under this action to meet these numbers are listed below:

Egg addling, destruction, and oiling. Included under this category of lethal control are methods of suppressing reproduction in local bird populations by destroying egg embryos prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid which covers the entire egg and prevents the egg from obtaining oxygen. Typically, egg oiling involves the spraying of a small quantity of food grade corn oil on eggs in nests. The oil prevents exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability (Pochop, 1998; Pochop et al., 1998). Egg addling or oiling is usually more effective than egg destruction because nesting birds generally continue incubation and do not re-nest. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. To be most effective, the oil would be applied anytime between the fifth day after the laying of the last egg in a nest and at least five days before anticipated hatching. A major advantage of this technique is that it can be applied solely to the target species with little or no impact to non-target animals. It is anticipated that a maximum of 6,000 cattle egret eggs in approximately 1,000 nests (based on current,

known nesting population levels near Moody AFB) would be treated in this manner on an annual basis.

Shooting. Shooting is not used to reduce population numbers. Shooting serves primarily to reinforce harassment techniques by associating a harmful event with the loud noises resulting from pyrotechnics for residual animals (Dolbeer, 1998). For example, a few cattle egrets or vultures could be shot from a flock to make the remainder of the birds more wary and to help reinforce non-lethal methods, including the use of effigies. However, shooting can be an effective method to remove select individuals. Normally shooting is conducted with shotguns, rifles, or air rifles, depending on the target species, and may be used in conjunction with spotlights, decoys, and calling. In the event individuals in rookeries are targeted for removal, shooters would use canoes or other silent watercraft to access the areas to minimize disturbance to non-target species. Shooting can be relatively expensive because of the staff hours sometimes required (USDA, 1997). An advantage of this technique is that the birds are killed as quickly and humanely as possible. The USAF would follow all firearm safety precautions and all laws and regulations governing the lawful use of firearms.

Trapping and Euthanasia. Trapping of cattle egrets and vultures followed by euthanasia may be conducted as part of the proposed action. This technique involves the capture of individual or several individuals of the target species through the use of mist nets, rocket or cannon nets, hand nets (at night), net guns, or baited traps. Mist nets are fine, black, silk or nylon nets available in different mesh sizes depending on the target species. Nets are hung from rigid poles and are placed in locations where target species are known to fly. When the birds hit the net, they fall into the net pocket and become entangled in the fine mesh. Non-target species are then released unharmed. This technique has proven extremely effective to capture cattle egrets in rookeries (Lee, personal communication).

Rocket or cannon nets are projectile-type net traps comprised of 3 to 5 rockets or cannons and a large net (Dill and Thornberry, 1950; Cox and Afton, 1994; Eriksen et al., undated). The net is folded upon itself or set inside a net box (Eriksen et al., undated). The rear of the net is anchored to 5 or 10 pound weights or staked to the ground. Bait is often placed in front of the net to attract the target species. The rockets or projectiles in the cannons are propelled by a smokeless powder charge or black powder charge, which is ignited with an electric squib inside the charge. This type of net can be effective in capturing birds, which are typically shy to other types of capture. This technique was used to capture the federally endangered California condor, a species closely related to turkey and black vultures. Net guns are similar in function to rocket or cannon nets, with the difference being that the nets are smaller and are mounted in a basket on the end of a firearm frame. The net is propelled out of the basket and over the target animal by using shotshell charges.

Hand nets are simply nets on the end of a long pole. For the proposed action, hand nets may be used to capture cattle egrets and vultures at night in roost locations. Following identification of the roost, USAF personnel would enter the area at night, locate the target animals with a light, and then capture them in the net. Decoy traps are similar in design to the Australian crow trap as reported by Johnson and Glahn (1994) and McCracken (1972). Baited traps would be monitored daily, or as appropriate, to remove and euthanize trapped birds and to replenish bait and water. Baited traps and other cage/live traps, as applied and used by the USAF, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed. Under the proposed action, baited traps could be used to trap vultures.

All non-target species captured would be immediately released at the trap site. Following capture, target birds would be humanely euthanized using either cervical dislocation or asphyxiation with carbon dioxide. With cervical dislocation, the bird is stretched and the neck is hyper-extended and dorsally twisted to separate the first cervical vertebrae from the skull. The American Veterinary Medical Association (AVMA) approves this technique as humane method of euthanasia and states that cervical dislocation when properly executed is a humane technique for euthanasia of small rodents, poultry and other small birds (Beaver et al., 2001). Cervical dislocation is a technique that may induce rapid unconsciousness, does not chemically contaminate tissue, and is rapidly accomplished (Beaver et al., 2001). With asphyxiation live birds are placed in a container and sealed shut. Carbon dioxide gas is released into the container and birds quickly die after inhaling the gas. This method is approved as a euthanizing agent by the AVMA (Beaver et al., 2001). Carbon dioxide gas is a byproduct of animal respiration, is common in the atmosphere, and is required by plants for photosynthesis. It is used to carbonate beverages for human consumption and is also the gas released by dry ice. The use of CO_2 for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by society.

The environmental effects of implementation of this alternative will be evaluated further in this document. It should be noted once again that this alternative involves the integration of all of the preceding BASH techniques, beginning with the non-lethal techniques and then progressing through the lethal techniques as needed. The best case scenario would be the control of bird risk through non-lethal techniques alone; however, because birds habituate to non-lethal harassment techniques, lethal techniques will probably have to be implemented to reinforce the non-lethal strategies and techniques.

3.3 Alternative 2 - Sole Implementation of Non-lethal Strategies and Techniques

This alternative would require the USAF to use only non-lethal strategies and techniques to reduce BASH risks on private and public lands within a 5-mile radius of Moody AFB. Additionally, this alternative would not allow the lethal control of black or turkey vultures on the installation or an increase in the number of cattle egrets currently

authorized for depredation. The non-lethal methods proposed for implementation under this alternative are described in 3.2.1 above. The environmental effects of this alternative will be evaluated further in this document.

3.4 Alternative 3 - Sole Implementation of Lethal Strategies and Techniques

This alternative would require the USAF to use only lethal strategies and techniques to reduce BASH risks on private and public lands within a 5-mile radius of Moody AFB. Additionally, this alternative would allow the lethal control of black and turkey vultures within the boundaries of Moody AFB, and would increase the allowed take of cattle egrets from 50 to 150 annually on the installation. The lethal methods proposed for implementation under this alternative are described in 3.2.2 above. However, since the implementation of this alternative would rely solely on the removal of problem individuals and species from the proposed project area, it is anticipated that a greater number of vultures and cattle egrets would have to be removed to accomplish the required objectives. Therefore, up to 75 black vultures, 100 turkey vultures, and 150 cattle egrets (currently authorized to take up to 50 cattle egrets annually) could be killed within the boundaries of Moody AFB annually. Additionally, up to 150 black vultures, 200 turkey vultures, and 500 cattle egrets could be killed annually within a five-mile radius on public and private lands surrounding Moody AFB. Therefore, the maximum number of target species that could be depredated under this action would be: 225 black vultures, 300 turkey vultures, and 650 cattle egrets. Additionally, it is anticipated that a maximum of 6,000 cattle egret eggs in approximately 1,000 nests (based on current, known nesting population levels near Moody AFB) would be kept from hatching. The environmental effects of this alternative will be evaluated further in this document.

3.5 Alternative 4 - No Action Alternative

This alternative would mean that no BASH management program activities would occur outside of the Moody AFB installation boundary, and that all BASH management program activities implemented to protect property, human health, and safety would occur solely within the confines of the installation or on AF-controlled property (e.g. areas controlled through easements or license agreements). Additionally, this alternative would not increase the number of cattle egrets currently approved for depredation and would not allow the depredation of black or turkey vultures within the boundaries of the installation. The environmental effects of this alternative will be further evaluated in this document.

3.6 Alternatives Removed from Consideration

Based upon the minimum selection criteria identified in 3.1 above, the following alternatives were removed from consideration because it was determined that these alternatives were either: 1) not compatible with existing laws, regulations, or policies; 2) not effective at reducing risks associated with cattle egrets or vultures; or, 3) not feasible

because they would require modifications to habitat or management practices on non-AF owned property by non-AF entities.

3.6.1 Lethal Removal of All Bird Species in Known Roosts. This alternative involves the killing and removal of all bird species observed in established roosts within a 5-mile radius of the Moody AFB airfield. This alternative was rejected for several reasons: 1) this alternative might require the killing of species protected under the Endangered Species Act or the Bald and Golden Eagle Protection Act, which would not be in accordance with DoD, ACC, or AF policy or other federal laws; 2) this alternative has been shown to be unrealistic based upon scientific evaluation of similar programs, including feral rabbit and pig control in Australia; 3) this alternative would be cost prohibitive because it would require full-time employees or contractors to accomplish and it would necessitate the off-site disposal of carcasses; 4) this alternative is unnecessary because research has shown that some wildlife species are compatible with airfield and aircraft operations; and, 5) this alternative would not be acceptable to the general public.
Therefore, this alternative was removed from consideration and will not be analyzed any further in this document.

3.6.2 Removal of Aircraft from Moody AFB. This alternative would involve the closing of the airfield and the removal of aircraft from Moody AFB. This alternative was rejected because the DoD and the AF have committed to maintaining an active facility at Moody AFB for the flying of combat and training missions. Additionally, the removal of aircraft to reduce BASH risks would be cost prohibitive because these aircraft and military missions would have to be transferred to other installations, resulting in the loss of Government jobs and economic inputs from the south Georgia area. Therefore, this alternative was removed from consideration and will not be analyzed any further in this document.

3.6.3 Use of Chemical Repellents. This alternative would involve the use of chemical repellents, including natural repellents (i.e. predator urine), to discourage cattle egrets and vultures from using established roosts. Such chemicals would include tactile-response (i.e. touch) chemicals, taste-aversive chemicals, and olfactory-response (i.e. smell) chemicals. While highly touted in the popular literature, scientific studies have shown that these chemicals have little or no efficacy in the long-term dispersal of wildlife. Scientific studies have shown that chemical repellents, when initially effective in repelling wildlife, lose their effectiveness after about 2-4 weeks. Additionally, because of the high cost of these chemicals, it is recommended in the literature that they be primarily used on small acreages with discrete wildlife problems; for example, Canada geese feeding on golf course greens. Therefore, because of the questionable efficacy, limited applicability to the Moody AFB problem wildlife species, and the extremely high costs, this alternative was removed from further consideration and will not be analyzed any further in this document.

3.6.4 Use of Ultrasonic Devices. This alternative would involve the broadcasting of ultrasonic sound to dispel cattle egrets and vultures. Despite claims in the popular press, this technique has been proven to be ineffective in removing birds from airfields and other environs, primarily because most species of birds do not hear ultrasound and, therefore, are not impacted by its use. Therefore, this alternative was deleted from further consideration because of its ineffectiveness and will not be analyzed any further in this document.

3.6.5 Sole Implementation of Environmental Management (Habitat Modification). Environmental management consists of the implementation of vegetation management practices on private and public land within a five-mile radius of Moody AFB, including such techniques as installing spikes and other mechanical deterrents on structures and roost sites, the pruning and removal of trees and shrubs, and the removal of bird attractants, such as standing water and open drainage ditches. Under this alternative, pasture and hayfield grass heights would be kept between 7 and 14 inches in accordance with applicable Air Force regulations and published scientific literature. Studies in both Great Britain and the United States have shown that grass heights in this range discourage the use of the airfield by most wildlife species and especially for small flocking birds. However, this alternative was deemed unfeasible because the USAF does not have rights to conduct habitat modification or management on non-AF controlled areas, and because there is no legally approved mechanism to expend Government funds on non-Government lands to reduce BASH risks. Additionally, foraging by the target species for this action is not affected by grass height. Therefore, this alternative was deleted from further consideration and will not be analyzed any further in this document.

3.6.6 Live Trapping and Relocation of Cattle Egrets and Vultures. Under this alternative, cattle egrets and vultures would be captured at roost sites within a five-mile radius of Moody AFB and relocated to other areas. Scientific studies conducted on the feasibility of relocating nuisance vultures reported that vultures returned to the original trap site within eight months of capture (Humphrey et al., 2000). This study confirmed the general thesis that relocation of highly mobile, migratory birds, such as cattle egrets and vultures, is ineffective because these birds have the ability to easily return to the original trapping locations, even from long distances (Humphrey et al., 2000). Additionally, concerns have been raised over the ecological impact of adding additional egrets and vultures into habitats already fully stocked with these species and the possibility of creating bird damage problems at the release location. Humphrey et al. (2000) concluded that relocations of highly mobile bird species were ineffective unless extensive habitat modification at the original site and harassment of returning birds were implemented following capture. The end result is that relocation of damaging vultures and cattle egrets to other areas following live capture generally would not be effective in reducing overall long-term BASH risks to Moody AFB aircraft. Therefore, this alternative was deleted from further consideration and will not be analyzed any further in this document.

3.7 Tabular Summary of Evaluated Alternatives

Table 3-1 shows a summary of the different strategies and techniques proposed for implementation for each of the evaluated alternatives.

Table 3-1: Summary of Strategies in Evaluated Alternatives

		Alternative 1 Proposed Action	Alternative 2 Non-lethal Control Only	Alternative 3 Lethal Control Only	Alternative 4 No Action Alternative
I. Lethal Strategies					
	Black Vulture Depredation[1], MAFB[2]	10	--	75	--
	Black Vulture Depredation, Off-base[3]	10	--	150	--
	Turkey Vulture Depredation, MAFB	20	--	100	--
	Turkey Vulture Depredation, Off-base	20	--	200	--
	Cattle Egret Depredation, MAFB	150	--	150	50[6]
	Cattle Egret Depredation, Off-base	250	--	500	--
	Egg Addling/Destruction/Oiling	<6,000 Eggs	--	<6,000 Eggs	--
II. Non-lethal Strategies					
	Prediction of Bird Occurrence	X	X	X[6]	X[6]
	Forage Reduction	X	X	X[6]	X[6]
	Bioacoustics[4]	X	X	X[6]	X[6]
	Pyrotechnics/Propane Cannons[4,5]	X	X	X[6]	X[6]
	Remote-controlled Planes[4]	X	X	X[6]	X[6]
	Mylar Tape/Balloons[4]	X	X	X[6]	X[6]
	Effigies[4]	X	X	X[6]	X[6]
	Lasers[4]	X	X	X[6]	X[6]
	Nest Destruction	<1,000 Nests	<1,000 Nests	--	--

[1]Depredation may include shooting or trapping and euthanasia
[2]MAFB = Depredation activities within the boundaries of Moody AFB
[3]Off-base = Depredation activities conducted within the ROI outside the boundaries of Moody AFB
[4]Strategies and techniques classified as wildlife dispersal techniques
[5]Pyrotechnics/Propane Cannons will not be used with the state-owned portion of Grand Bay WMA to prevent unintentional disturbance of nesting non-target species
[6]Currently authorized within the boundaries of Moody AFB as part of the Moody AFB BASH Management Program. Will not be implemented outside Moody AFB within the ROI.

4.0 ENVIRONMENTAL EFFECTS

This section documents the predicted environmental effects of each analyzed alternative, including the proposed action. This information will be used by the decision-maker as part of this process for determining which alternative to implement to reduce the BASH risk for Moody AFB aircraft and pilots. The no action alternative serves as the baseline for the analysis and the comparison of anticipated effects on the identified issues and concerns among the alternatives. Cumulative impacts associated with the proposed action and the alternatives will also be addressed in this section. There are no irreversible or irretrievable commitments of resources anticipated under the proposed action and the alternatives.

Based upon the size and scope of the proposals, the following resource values are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, cultural resources, visual resources, air quality, prime and unique farmlands, aquatic resources, vegetative resources, and land use. The environmental impact of the alternatives on these resources will not be analyzed further in this document.

4.1 Effects on Target Bird Species Populations

4.1.1 Effects of Alternative 1 – Proposed Action

The target bird species for the proposed action are the black vulture, turkey vulture, and cattle egret. These species have been identified by Moody AFB as the current species of greatest risk and as those most likely to result in a catastrophic event in the case of a bird-aircraft collision at this time. The main objectives of the proposed action include: 1) maintaining the Moody AFB airfield and operating environs within the ROI at Bird Condition Code Low or Moderate (see Table 1-1); 2) to avoid significantly impacting non-target avian populations or ecological functions within the ROI; 3) to reduce the number of vultures using the roost at Grand Bay WMA by 50% by encouraging them to relocate their roost to another location outside the ROI; and, 4), to reduce the number of cattle egrets currently using the Grand Bay WMA rookery by at least 50% from current population levels.

Black vultures, turkey vultures, and cattle egrets are all non-game species identified under the MBTA. As such, the incidental and direct take of these species is managed by the USFWS under a permit system. Based on scientific studies, including the BBS and the CBC, the USFWS has determined the maximum level of take (threshold) that can be allowed without harming the continued viability of the residual population. The USFWS limits the number of annual depredation permits issued based on these threshold population levels. Regional population trend reports for these three species generally conflict, with some sources showing stable to increasing populations and others documenting declines in populations over the past 30 years. Local reports indicate a

greater number of vultures and cattle egrets within the ROI; however, these may be indicative of reporter-bias since these species may have been under-represented in earlier reports. Because of a lack of solid, scientific documentation of current population levels and population trends, the impact on regional and local populations will be deferred to the USFWS, which is the regulatory agency charged with the protection and maintenance of these species.

Under this alternative, a maximum of 20 black vultures, 40 turkey vultures, and 400 cattle egrets could be harvested annually to reinforce non-lethal BASH techniques (e.g., pyrotechnics, lasers, effigies, etc.) and to reduce large vulture concentrations within a five-mile radius of the Moody AFB airfield, including depredation within the installation boundaries. Also, a maximum of 1,000 cattle egret nests may be destroyed and 6,000 cattle egret eggs addled or oiled annually as part of this action. However, best estimates of local cattle egret populations point to a stable or increasing population, and since the rookery at Grand Bay WMA is not the sole source of cattle egret production, it is expected that any loss of reproduction in this ecosystem will be offset by reproduction in other areas. Long-term banding studies of black vultures in Louisiana indicates that adult vultures have very low mortality rates, are very long-lived, and are very productive over their lifetime (Parmalee and Parmalee, 1967). Declines in vulture populations have been attributed to a loss of nesting habitat and the influence of pesticides on eggshell thickness, rather than direct mortality events (GWF, 2003). The proposed action does not involve the destruction of nesting habitat, and the loss of a few individual vultures during the nesting season will not have a significant impact on overall vulture populations because it will be compensated for by low adult mortality rates and the inherent productivity of vultures in the region. Additionally, because of the restrictions on depredation imposed by the USFWS MBTA permit system, the removal of these individuals from the proposed project area should not have a significant effect on local, statewide, regional, or national populations.

Concerns have been raised about the potential impact of the proposed action on vulture populations outside the ROI relative to source-sink dynamics (Bergstrom, personal communication). Source-sink dynamics are used to characterize productivity flow within a metapopulation. Specifically, source areas as defined as areas where productivity is greater than mortality, and the population is characterized as increasing (Pulliam, 1988; Perkins et al., 2003). Sink areas are defined as areas where productivity is less than mortality, and they are maintained only through immigration from source areas (Pulliam, 1988; Perkins et al., 2003). During times of low reproduction, populations in these areas can be extirpated. Negative population impacts, including extirpation, can occur when source populations are destroyed and the remaining sink populations are incapable of producing enough young to maintain population levels (Pulliam, 1988; Perkins et al., 2003). However, as indicated above and in the description of the proposed action (see 3.2 above), no activities are proposed that will have a negative impact on nesting habitat or nesting individuals. Vultures do not rear young or nest in the roost at Grand Bay WMA, and since both male and female vultures attend at the nest and brood their young

through the fledging period, nesting vultures within the ROI would presumably be absent from the roost at Grand Bay WMA during the nesting period. It is possible that reproductive individuals from other populations outside the ROI may be removed during depredation activities, but the loss of a relatively few individuals would not have a significant impact on any source populations that may be contributing to the overall population levels at Grand Bay WMA or within the ROI.

Concerns have been raised over the impact of the proposed action on vulture carrying capacity (Bergstrom, personal communication). It is difficult to characterize the carrying capacity of an area for carrion-eaters and scavengers, such as vultures. The carrying capacity within the ROI has been drastically impacted through urbanization and the construction/widening of local highways and other roads. For instance, the recent widening of Bemiss Road (GA Highway 125) has apparently led to an increase in vehicle-killed carcasses (Lee, personal communication); however, these animals are generally not available as forage for vultures because they are removed from the roadways by Georgia DOT and Lowndes County maintenance workers. Additionally, while not investigated scientifically, personal observations of vulture foraging habits in the ROI indicate that vultures seem to utilize less-traveled roads for foraging purposes than the more heavily traveled roads within the ROI. Vultures tend to flush from feeding sites adjacent to roads when vehicles approach, leading to an energetic cost. Presumably, the heavy amount of traffic on some roads, such as Bemiss Road and local interstate highways, creates too large an energetic cost to vultures and precludes them from foraging in these areas except during periods of time when vehicle usage is low (weekends). Other activities are already occurring within the ROI that reduce the attractiveness of the area to vultures and other scavengers. For instance, local farmers and ranchers dispose of dead livestock through burning or burial instead of allowing scavengers to feed on them. Additionally, hunters on Moody AFB are not allowed to field dress harvested game animals and are required to dispose of viscera and other waste parts in sanitary landfills outside the ROI. The proposed action may lead to a decrease in the current carrying capacity for vultures by entering into agreements whereby farmers and ranchers in the ROI are required to remove dead livestock and other animals within 24 hours of discovery. Coleman and Fraser (1989) reported that black vultures have a home range of 36,771 acres and turkey vultures have a home range of 91,606 acres. Given the fact that the ROI is only 3,200 acres in size, it is obvious that the majority of foraging by the vultures roosting at the Grand Bay WMA occurs outside the ROI. Therefore, any reduction in carrying capacity is likely to have a minimal effect on vulture populations within the ROI without the implementation of other strategies and techniques.

Wildlife dispersal techniques, such as the use of pyrotechnics, effigies, lasers, and remote-controlled aircraft, would be used to discourage vultures and cattle egrets from utilizing areas within a five-mile radius of the airfield. These techniques, properly applied, have the potential to cause indirect effects on the target species. It has been long recognized that noise and other frightening events can affect an animal's behavior and

reproductive activity, with chronic noise stress resulting in long term effects on an animal's physiological system (i.e., increased heart rate, and altering of metabolism and hormone balance) (Radle, 2001). In recent years, numerous studies detailing the effects of such events on wildlife species have been published, often with conflicting results. For example, Kuck et al. (1985) noted that elk calves abandoned areas with high noise events resulting from simulated mine disturbances, while Krausman et al. (1998) reported no alteration of behavior or use of habitat by mountain sheep as a result of military aircraft overflights. Therefore, the frightening of birds foraging or roosting in the proposed project area might have minor effects on their energetic resources as they flush when frightened; however, when the bird relocates to a more suitable area for foraging and roosting away from the proposed project area, these resources would quickly be restored. Additionally, scientific studies concerning the effects of aircraft noise on wildlife species have generally concluded that wildlife species quickly habituate to aircraft noise, with no long-term negative behavioral, reproductive, or physiological impacts (Grubb and King, 1991; Weisenberger et al., 1996; Conomy et al., 1998; Krausman et al. 1998; Brown et al., 1999; Delaney et al., 1999; Doresky et al., 2001); the same would hold true for pyrotechnics, propane cannons, and the use of other wildlife dispersal techniques.

The overall goal for the proposed action is to reduce vulture and cattle egret usage of the Grand Bay WMA roost and rookery, respectively, by 50% to decrease the potential risk for Moody AFB pilots and aircraft in the ROI. While there may be some limited negative impacts on individual birds as a result of implementation of these techniques, there should not be an overall significant impact on vulture or cattle egret populations on a local, statewide, regional or continental level.

4.1.2 Effects of Alternative 2 - Sole Implementation of Non-lethal Strategies and Techniques

Under this alternative, wildlife dispersal techniques, such as the use of pyrotechnics, effigies, lasers, and remote-controlled aircraft, would be used to discourage vultures and cattle egrets from utilizing areas within a five-mile radius of the airfield. Additionally, this alternative would include the destruction of cattle egret nests (prior to egg laying) to discourage nesting within the proposed project area. As indicated in 4.1.1 and in the Moody AFB BASH Program EA for on-base actions (USAF, 2001a), there may be some limited negative impacts on individual birds as a result of implementation of these techniques, primarily as a result of physiological responses to noise and to other frightening events. However, since these physiological responses are reversed when the bird leaves the proposed project area, any indirect negative impacts should be temporary and should not have long-term implications on either the individual or population level. Therefore, there should be no significant impacts on vulture or cattle egret populations as a result of implementation of this alternative.

4.1.3 Effects of Alternative 3 - Sole Implementation of Lethal Strategies and Techniques

Under this alternative, a total of 225 black vultures, 300 turkey vultures, and 650 cattle egrets could be killed annually within a five-mile radius of the Moody AFB airfield, including those killed within the installation boundaries. Additionally, it is anticipated that a maximum of 6,000 cattle egret eggs in approximately 1,000 nests (based on current, known nesting population levels near Moody AFB) would be kept from hatching. As indicated in 4.1.1 above, the USFWS regulates direct take of these species through the MBTA permit system to prevent negative population effects. However, it is unknown if the USFWS would permit the removal of vultures and cattle egrets at this magnitude. Given this level of depredation, it is expected that there would be negative impacts on reproductive levels for all three species on a local level; however, these losses would probably be compensated for at the statewide and regional levels. Some migrating individuals might be killed as a result of implementation of this alternative, but because migrants are transient and quickly pass through the area, there should not be any long-term effects on migratory populations of any of the three target species, and it is not anticipated that there would be any effects on vulture reproduction outside of the ROI. Therefore, even though there might be noticeable effects on local populations, overall there should not be any significant effects to vulture or cattle egret populations as a result of implementation of this alternative.

4.1.4 Effects of Alternative 4 - No Action Alternative

Under this alternative, there would not be any significant impacts on target species populations within the proposed project area.

4.2 Effects on Non-target Species Populations, including RTE Species.

4.2.1 Effects of Alternative 1 – Proposed Action

Non-target bird species and other wildlife species are usually not affected by BASH management methods, except for the occasional scaring from harassment devices. In these cases, migratory birds and other affected wildlife may temporarily leave the immediate vicinity of scaring, but would most likely return after conclusion of the action. While every precaution is taken to safeguard against taking non-target species, at times changes in local animal movement patterns and other unanticipated events could result in the incidental take of unintended species. These occurrences are rare and should not affect the overall populations of any species. Personnel conducting depredation activities will be trained in the field identification of target species, and will not intentionally harm or kill a non-target species during depredation activities. In an effort to minimize any potential negative impacts to non-target species (i.e. sandhill cranes, anhingas, great blue herons, great egrets, white ibis, etc.) utilizing the rookery at Grand Bay WMA, pyrotechnics will not be used at Grand Bay WMA during the nesting season.

Non-target bird species that could potentially be affected by cattle egret management actions include those colonial waterbirds that use similar habitat types as nesting cattle egrets. These bird species may include a variety of heron and egret species, including great egrets, tri-colored herons, little blue herons, and white ibis. Nest and egg removal and destruction activities may temporarily disturb colonial waterbirds nesting in the general vicinity of where this type of action takes place. Carney and Sydeman (1999) noted that nesting colonial waterbirds, when disturbed by humans, often flush from their nests, during which time nest contents can be spilled, exposed to predation, or harmed by exposure to the elements; nest abandonment may also occur. However, there is no evidence indicating that the proposed BASH management practices are a threat to the population viability of these non-target species of colonial waterbirds. As cattle egret numbers decrease in individual rookeries, the use of wildlife dispersal techniques will cease to minimize potential effects on non-target species.

Proposed actions may actually aid in shifting the nesting ecology from non-native cattle egrets to a more diverse rookery of native birds. Conversations with the Georgia DNR has indicated that the presence of cattle egrets in the Grand Bay WMA rookery has resulted in negative impacts to native species, primarily through discouraging renesting by these other species (Hon, personal communication). As cattle egret nesting populations are reduced in the proposed project area, there should be an increase in nesting attempts and success by native species.

The reduction of vulture populations within the ROI has the potential to result in population increases for other scavenger species, including both vertebrates and invertebrates. While the amount of carrion available for consumption by animals within the ROI will not change, more carrion will be available for other species since the use of the resource by vultures will presumably be decreased. Therefore, there may be positive impacts to populations of other scavengers and omnivores, such as coyotes, foxes, raccoons, and ants. However, given the relatively small area of influence, any such population changes are likely to be small in scope and not significant overall.

A review of the list of potentially occurring RTE species indicated that the only species with the potential to be affected by the proposed actions would be the wood stork and the bald eagle. Wood storks are known to occur within the proposed project area; however, according to 2001 nesting data provided by the Georgia DNR, there are no wood stork nesting sites (rookeries) within the proposed project area. Occurrence of the wood stork in this area is limited to foraging forays in open water during times of decreasing water levels. Bald eagles have been occasionally sighted within the proposed project area; however, the majority of these sightings can be attributed to migrating birds and are not resident or breeding individuals. According to 2001 nesting data provided by the Georgia DNR, there are no active bald eagle nests located within the proposed project area. A historical nest occurred northeast of the proposed project area in the Banks Lake National Wildlife Refuge, but has not been used by eagles for at least four years. In order

to minimize potential effects on RTE species, no depredation or wildlife dispersal actions will take place if either wood storks or bald eagles are present within the immediate vicinity. Additionally, a list of wood stork and bald eagle nests will be obtained from the Georgia DNR annually to ensure that future activities do not affect these species.

Therefore, as a result of the targeted implementation of techniques and the restriction on implementation of activities if RTE species are present, there should not be any significant impacts on non-target species, including RTE species, as a result of implementation of this alternative.

4.2.2 Effects of Alternative 2 - Sole Implementation of Non-lethal Strategies and Techniques

The effects of implementation of non-lethal strategies and techniques alone should be similar in size and scope to the proposed action, as described in 4.2.1 above. Therefore, there should not be any significant impacts on non-target species, including RTE species, as a result of implementation of this alternative.

4.2.3 Effects of Alternative 3 - Sole Implementation of Lethal Strategies and Techniques

The effects of implementation of lethal strategies and techniques alone should be similar in size and scope to the proposed action, as described in 4.2.1 above. Therefore, there should not be any significant impacts on non-target species, including RTE species, as a result of implementation of this alternative.

4.2.4 Effects of Alternative 4 - No Action Alternative

There would be no significant effect on non-target species, including RTE species, as a result on continuing the no action alternative. However, native colonial waterbird populations would continue to experience depressed reproduction as a result of interspecific competition with cattle egrets in mixed species rookeries.

4.3 Effects of Damage to Property from Bird Strikes

4.3.1 Effects of Alternative 1 – Proposed Action

Currently, Moody AFB aircraft are involved in an average of 23.5 bird strikes annually, with annual bird strike rates per 1000 sorties ranging from 0.6 to 21.6, depending on the type of aircraft involved. Over 90% of all bird strikes involving Moody AFB aircraft occur at low altitudes outside of the boundary of the installation. These strikes typically result in minimal damage to aircraft, with property damage costs of less than $100,000. However, the potential for the total destruction of an aircraft remains extremely likely,

especially given the recent changes in military aircraft flight patterns and the documented increases in target species populations.

Following implementation of BASH management activities on Moody AFB, the prevalence of target bird species on the airfield dropped dramatically, with a corresponding reduction in documented bird strikes occurring within the boundaries of the installation. These results have been replicated at all USAF installations and FAA-regulated airfields with active BASH management programs. It is anticipated that similar results would be obtained within the proposed project area following implementation of the proposed action. The end result would be a reduction in the risk of bird-aircraft collisions with target species, causing a significant reduction in property damage within a five-mile radius of the Moody AFB airfield.

4.3.2 Effects of Alternative 2 - Sole Implementation of Non-lethal Strategies and Techniques

Scientific evaluations of the efficacy of non-lethal strategies and techniques have indicated that these techniques are quite effective at reducing wildlife numbers on a short-term basis. However, most wildlife species habituate quickly to wildlife dispersal activities, and thus the techniques lose their effectiveness (Belant et al., 1996; Andelt et al, 1997; Harris and Davis, 1998; Carter, 2000). In fact, this tendency to habituate to noise and disturbance has created the BASH risk that predicated the current need for action. White-tailed deer and cattle egrets on Moody AFB have been observed to continue feeding while propane cannons and other pyrotechnics were fired within 30 feet of their positions (Lee, personal communication). Because of this tendency of wildlife species to habituate to wildlife dispersal techniques, it is anticipated that the implementation of this alternative would only result in a short-term decrease in risk for bird-aircraft collisions; following habituation, the risks would return to the current level and would be expected to increase as target species populations increase. Therefore, there would not be a significant decrease in property damage as a result of implementation of this alternative.

4.3.3 Effects of Alternative 3 - Sole Implementation of Lethal Strategies and Techniques

Scientific studies on the efficacy of lethal control of problem wildlife species on airfields have indicated similar results to that of implementation of non-lethal strategies and techniques alone. Lethal strategies and techniques seem to be more effective when targeted against specific problem individuals in specific discrete areas, and does not result in effective long-term control at the population level (Harris and Davis, 1998). Depredation appears to be most effective when used to supplement wildlife dispersal techniques (Harris and Davis, 1998). Additionally, depredation activities could only be implemented in areas where the firing of weapons could be safely conducted. This restriction may result in the creation of safe havens for target species where large

congregations of target species could not be removed within the proposed project area. It is anticipated that this technique would prove effective at further reducing vulture and cattle egret populations within the boundaries of the installation, but would have little long-term effect on vulture or cattle egret populations within the five-mile radius around the Moody AFB airfield. Therefore, there would not be a significant reduction in property damage as a result of implementation of this alternative.

4.3.4 Effects of Alternative 4 - No Action Alternative

Without the implementation of a BASH management program on public and private properties within a 5-mile radius of Moody AFB, it is expected that bird damage to property would continue or possibly increase above current levels as target species populations continue to increase. Therefore, there would not be a significant reduction in property damage as a result of implementation of this alternative.

4.4 Effects on Human Health and Safety

4.4.1 Effects of Alternative 1 – Proposed Action

The implementation of this alternative has the potential to affect human health and safety directly as a result of accidents associated with the use of firearms, pyrotechnics, and projectile nets (e.g., rocket or cannon nets, net guns). Accidental shootings associated with the use of firearms continues to be a leading cause of injury and death among the general public, resulting in the requirements for hunters to attend a Hunter Safety Class. Similar accidents can occur with pyrotechnics and projectile nets. This potential effect would be mitigated by limiting the use of firearms, pyrotechnics and projectile nets to trained and experienced personnel only. Personal protective equipment, including shooting goggles, gloves, and ear protection would be used. Firearms would be used only in areas without humans; prior to the initiation of depredation activities, the areas would be searched and all persons in the immediate area would be removed. Additionally, USDA/APHIS/WS conducted a formal risk assessment of bird management methods similar to those proposed under this action, and found that risks to human safety from the use of these methods was low (USDA, 1997, Appendix P). Therefore, there should be no significant direct effects on human health or safety as a result of implementation of this alternative.

As indicated in Chapter 1.0, bird strikes can result in human injury and death. It is for this reason that the proposed action has been recommended for implementation. An integrated BASH management program, utilizing a combination of lethal and non-lethal methods, has the greatest potential of successfully reducing risks to pilots and other aircraft personnel from target species. Therefore, there should be a significant reduction in risks to human health and safety as a result of implementation of the proposed action.

4.4.2 Effects of Alternative 2 - Sole Implementation of Non-lethal Strategies and Techniques

Under this alternative, direct risks to personnel using firearms to disperse pyrotechnics would be similar to those described in 4.4.1 above. The same safety precautions proposed for the proposed action would also be implemented under this alternative. As a result of implementation of these safety precautions, there should be no significant direct effects on human health or safety as a result of implementation of this alternative.

As indicated in 4.3.2 above, the implementation of this alternative is not expected to cause significant reductions in the risk of bird-aircraft collisions. Therefore, the risk to pilots and other aircraft personnel would remain the same or would increase as target species populations increase. Implementation of this alternative would not result in a significant effect on human health or safety.

4.4.3 Effects of Alternative 3 - Sole Implementation of Lethal Strategies and Techniques

The effects of this alternative would be similar to those for Alternative 2 - Implementation of Non-lethal strategies and techniques, both for direct impacts to BASH management program personnel and to pilots and other aircraft personnel. Therefore, the risk to BASH management program personnel would be mitigated, and the risk to pilots and other aircraft personnel would remain the same or would increase as target species populations increase. Implementation of this alternative would not result in a significant effect on human health or safety.

4.4.4 Effects of Alternative 4 - No Action Alternative

There would be no change in risk to BASH management program personnel or pilots and other aircraft personnel as a result of the implementation of this alternative. Risks to pilots and other aircraft personnel would remain high and would probably increase as target species populations increase. The chance of a catastrophic incident would remain high. Therefore, implementation of this alternative could potentially result in a significant effect on human health and safety.

4.5 Effects on Human Affectionate-Bonds with Individual Animals and on Aesthetic Values of Wildlife Species

4.5.1 Effects of Alternative 1 – Proposed Action

Under this alternative, limited numbers of black vultures, turkey vultures, and cattle egrets would be killed. Additionally, cattle egret rookeries would be targeted for nest

destruction and egg addling/oiling, and vulture roosts would be targeted for harassment. These actions would likely be viewed negatively by some people for a variety of reasons, including those who have affectionate-bonds with wildlife species and those who are concerned over the impact on aesthetic values. Birding and bird-feeding have become increasingly popular over the past 20 years, with the U.S. Forest Service reporting an increase of 155% in birding participation since 1980. A study recently conducted in northern Florida reported that 20% of Florida residents were involved in bird-watching activities, spending almost $700 annually in pursuit of their hobby. Wildlife viewing in Florida brings in over $2 billion in economic impact annually. Economic impacts associated with bird-feeding are much higher, as over 54 million people in the U.S. alone participate in bird-feeding activities.

Some people who routinely view or feed individual birds would likely be disturbed by removal of such animals under the proposed program. Some people have expressed opposition to the killing of any birds during BASH management program activities. While it is impossible to accurately gauge the effect of implementation of the proposed action on affectionate-bonds or aesthetics, it is anticipated that these effects would be minimal for the proposed action. Most birders and bird-feeding enthusiasts are primarily interested in viewing and attracting neotropical migratory songbirds, while those persons interested in viewing raptors typically focus on hawks, eagles, and kites, and other more charismatic species. Likewise, some persons are interested in observing RTE species in their natural habitats. The three target species for the proposed action -- black vulture, turkey vulture, and cattle egret -- are extremely common species, do not possess colorful plumage, do not sing, and are not attracted to feeders; therefore, these species are generally not targeted by birders or bird-feeding enthusiasts for their enjoyment. Lethal control actions would be restricted to local sites and to small, insubstantial percentages of overall populations. Therefore, these target species would remain common and abundant outside the proposed project area, and would therefore continue to remain available for viewing by persons with that interest.

Concerns have also been raised that the implementation of this alternative would result in negative wildlife viewing experiences. Without question, the use of firearms, pyrotechnics, and wildlife dispersal techniques in the presence of birders would diminish the value of their viewing experience. This negative experience may be compounded by the fact that the proposed project area includes a portion of the Grand Bay-Banks Lake Ecosystem, which has been recognized by the Audubon Society as an Important Bird Area. In recognition of this potential for negative impacts to the wildlife viewing public, all BASH management program activities proposed for public viewing areas, especially Grand Bay WMA and Banks Lake NWR, would be limited to weekdays only to avoid the preferred times for wildlife viewing in these areas. Additionally, if BASH management program activities are required to be conducted at any of these public viewing sites, the areas would be closed to the public during implementation of the activities, both to avoid creating a negative wildlife viewing experience and for safety purposes.

On the other hand, the implementation of the proposed actions should result in an increase in native colonial waterbird nesters within the proposed project area. As cattle egret breeding numbers are reduced through nest destruction and egg addling/oiling, breeding attempts by native species, such as white ibis, little blue heron, and great egrets, should increase. From this standpoint, the proposed action would increase the aesthetic qualities within the proposed project area for those persons interested in viewing native herons, egrets, and ibises.

To summarize the potential effects on affectionate-bonds and aesthetic values, it is anticipated that there would be minimal impacts on affectionate-bonds as a result of implementation of this action. There may be some negative impacts associated with the direct implementation of activities, but these would be mitigated by restricting activities to weekdays and restricting access to areas during BASH program actions. Overall aesthetic values for most persons would increase as cattle egret numbers decrease and native species populations increase and become more visible. Therefore, there should not be any significant effects on affectionate-bonds or aesthetic values as a result of implementation of the proposed action.

4.5.2 Effects of Alternative 2 - Sole Implementation of Non-lethal Strategies and Techniques

Implementation of this alternative should produce effects similar to those described in 4.5.1 above. However, this alternative does not involve the direct killing of any wildlife species, which would further lessen any negative impacts on affectionate-bonds or aesthetic values. Therefore, there should not be any significant impacts associated with implementation of this alternative.

4.5.3 Effects of Alternative 3 - Sole Implementation of Lethal Strategies and Techniques

Implementation of this alternative should produce effects similar to those described in 4.5.1 above. However, this alternative does involve the direct killing of twice as many target species as the proposed action. The additional depredation activities may lead to greater negative impacts on affectionate-bonds and aesthetic values to certain individuals. However, since the proposed activities would be mitigated by excluding the public from areas where actions are taking place and by the fact that there should not be a decrease in target species populations on a county-wide or state-wide level, these negative effects should be minimal. Therefore, there should not be any significant impacts associated with implementation of this alternative.

4.5.4 Effects of Alternative 4 - No Action Alternative

Since this alternative does not include the additional killing of target species, there should not be any negative impacts on affectionate-bonds as a result of implementation.

Without active control, cattle egret numbers would continue to increase and cattle egrets would continue to discourage nesting activities by native colonial nesters. Therefore, there may be a negative impact on aesthetic values for those individuals who prefer to view native wildlife species, especially herons, egrets, and ibises. However, there have not been any long-term studies of the impact of cattle egrets on native species, and it is not known if this trend would continue or if equilibrium would be reached in the rookery. At this time there is no evidence that cattle egrets would greatly suppress other species to the extent of excluding them from the ecosystem. Therefore, even though there would definitely be increased negative impacts on aesthetic values as a result of implementation of this alternative, these should not be significant.

4.6 Humaneness and Animal Welfare Concerns of Lethal Methods

4.6.1 Effects of Alternative 1 – Proposed Action

Under this alternative, methods viewed by some persons as inhumane would be used, including depredation, nest destruction, egg addling/oiling, and wildlife dispersal activities. Humaneness, as it relates to the killing or capturing of wildlife is an important but complex concept that can be interpreted in a variety of ways. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently.

Some persons feel that the killing of an animal in any way is inhumane. This would include the shooting of vultures and cattle egrets and the euthanization of these species trapped in nets. Additionally, the perceived stress and trauma associated with animals being held in traps until someone arrives to euthanize the animal may be unacceptable to some persons.

The potential negative view of the humaneness of these actions would be mitigated by the implementation of animal welfare concerns. Shooting of vultures and cattle egrets would be limited to trained, experienced marksmen. Shooting, when performed by experienced professionals, usually results in a quick death for animals. Occasionally, however, some birds are initially wounded and must be shot a second time or must be caught by hand and then euthanized. The euthanasia of these birds, as well as any vultures or cattle egrets captured alive, would be conducted only with methods approved by the American Veterinary Medical Association (AVMA) guidelines. Therefore, these birds would be euthanized either through cervical dislocation or by asphyxiation with carbon dioxide (CO_2) gas. Both of these methods are AVMA-approved euthanasia methods (Beaver et al., 2001).

Some persons would consider the implementation of the proposed action as being inhumane. However, given the objectives of the proposed action, most persons in the affected area would agree that the activities, while resulting in the death of some individual animals and the disturbance of others, were necessary. Additionally,

mitigating activities designed to minimize pain and suffering to the target species would be implemented. Therefore, there should not be any significant effects as a result of implementation of this action.

4.6.2 Effects of Alternative 2 - Sole Implementation of Non-lethal Strategies and Techniques

Since this alternative does not involve the direct killing of any wildlife species, many persons would find this alternative more humane than the proposed action. Some animals would still be disturbed and frightened during implementation of the wildlife dispersal techniques and strategies. However, these would be of short-term duration and would not cause any lasting effects to the individual animals. Therefore, there should not be any significant effects as a result of implementation of this action.

4.6.3 Effects of Alternative 3 - Sole Implementation of Lethal Strategies and Techniques

The effects of implementation of this alternative would be similar to those described in 4.6.1 above for the proposed action. Even though this alternative involves the potential killing of almost twice as many vultures and cattle egrets, the potential negative view of the humaneness of this action should not be any greater than that of the proposed action. For most of the persons who object to the lethal removal of wildlife species, the concern is over the actual physical act of shooting or euthanasia, not the numbers of animals being depredated. The same mitigation measures identified in 4.6.1 above would be implemented for this alternative. Therefore, since the effects would be similar to those described for the proposed action, there should not be any significant effects as a result of implementation of this alternative.

4.6.4 Effects of Alternative 4 - No Action Alternative

There would not be any significant effects concerning humaneness or animal welfare issues as a result of implementation of this alternative.

4.7 Cumulative Effects

4.7.1 Definition of Cumulative Effects

The Council on Environmental Quality (CEQ) implementing guidelines for NEPA require that both the direct and the cumulative effects of an action be evaluated and published. Cumulative effects (impacts) are the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. In other words, an environmental assessment must determine if non-significant direct effects caused by implementation of the proposed action or any of the alternatives would become significant if considered in

concert with other actions occurring within the area of interest, defined both geographically and temporally. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for an incremental impact than those more geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, the analysis needs to address two fundamental questions:

1. Does a relationship exist such that affected resource areas of the proposed action or alternatives might interact with the affected resource areas of past, present, or reasonably foreseeable actions?

2. If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

4.7.2 Scope of Cumulative Effects Analysis

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur, as well as a description of what resources could potentially be cumulatively affected. Of all the issues and concerns presented and analyzed in this document, the only two resources with the potential to be affected cumulatively were determined to be effects on target and non-target species.

When addressing cumulative impacts to target and non-target species, the geographic extent for the cumulative effects analysis would include the southern Georgia and northern Florida areas, primarily concentrating on past, present, and reasonably foreseeable actions on and within a five-mile radius of Moody AFB. This area will be referred to as the Region of Influence (ROI) for the remainder of this document. If any incremental significant impacts are observed in vulture, cattle egret, or non-target species population levels, they would more likely be observed in this geographic area rather than in other, more distant, portions of the species' ranges.

The time frame for cumulative effects analysis would center on the timing of the proposed action and would continue into the foreseeable future; additionally, actions with the potential to impact target and non-target species that were implemented within the past four years would be included for analysis. Actions conducted prior to this time probably would have little impact on population levels, as indicated by increasing population trends for all three of the target species.

4.7.3 Past, Present, and Reasonably Foreseeable Actions

Numerous other activities, conducted by private and local, state, and federal government agencies, have been conducted within the ROI during the past two years, and more

actions are expected to continue into the future. For the purposes of analysis, only those actions with the potential to directly affect target and non-target species populations will be addressed.

Past and Present Actions Relevant to the Proposed Action

- *Force Structure Actions.* In 1998, the Air Force made the decision to implement force structure changes at Moody AFB. These changes included the removal of all A-10 aircraft and the addition of T-38 training planes to Moody AFB. Additionally, this action included the addition of six HH-60 helicopters to the Moody AFB Primary Aircraft Inventory (PAI). These aircraft are currently operating at Moody AFB. An EA was prepared to cover the environmental effects of this action, resulting in a Finding of No Significant Impact (FONSI).

- *Drawdown of F-16 Aircraft.* In 1999, the Air Force made the decision to remove all F-16 aircraft from the Moody AFB PAI. An EA was prepared to cover the environmental effects of this action, resulting in a Finding of No Significant Impact (FONSI).

- *Search and Rescue Training by HC-130 Aircraft and HH-60 Helicopters.* In 1999, the Air Force made the decision to create a water training area in the Gulf of Mexico for use by Moody AFB HH-60 helicopters. An EA was prepared to cover the environmental effects of this action, resulting in a Finding of No Significant Impact (FONSI). This area is currently being utilized by Moody AFB aircraft.

- *Bird-Aircraft Strike Hazard (BASH) Program.* In 2000, the Air Force made the decision to modify an existing BASH program within the boundaries of Moody AFB by adding additional techniques and strategies in an integrated fashion. An EA was prepared to cover the environmental effects of this action, resulting in a Finding of No Significant Impact (FONSI).

- *Joint Primary Aircraft Training System (JPATS)/T-6A Beddown.* In 2000, the Air Force made the decision to add T-6A training aircraft to the Moody AFB PAI. An EA was prepared to cover the environmental effects of this action, resulting in a Finding of No Significant Impact (FONSI). These aircraft began arriving on Moody AFB in 2001, and are currently operating on the installation.

- *Wildlife Damage Control at Moody AFB by U.S. Department of Agriculture Personnel.* In 2002, the Air Force entered into a cooperative agreement with the U.S. Department of Agriculture, Wildlife Services Division, to conduct wildlife damage control in support of the BASH management program at Moody AFB. In addition to implementing the Moody AFB BASH Management Plan, USDA would conduct additional depredation activities within the boundaries of Moody AFB as deemed necessary to ensure the objectives of the program were met.

- *Wildlife Damage Control by U.S. Department of Agriculture, Wildlife Services Personnel on Private and Public Properties in Southern Georgia and Northern Florida.* Wildlife Services conducts wildlife damage management activities throughout the nation, including southern Georgia and northern Florida, as requested by private and public landowners and managers. Therefore, it is possible that Wildlife Services may conduct similar bird damage management activities as described in this EA on other areas outside the proposed project area. These activities are conducted pursuant to appropriate federal and state laws and regulations, including the National Environmental Policy Act and the Migratory Bird Treaty Act.

Reasonably Foreseeable Actions Relevant to the Proposed Action

- *Private Residential Housing Construction.* Over the past five years, several single-family residential homes and subdivisions have been constructed within the ROI. Construction has been extremely noticeable within the general area immediately south of Moody AFB near Bemiss Road, Studstill Road, and Knights Academy Road. It is anticipated that such construction would continue in the future as the population of Lowndes County continues to grow.

- *Commercial Property Construction.* Over the past five years, several commercial property sites have been developed in the ROI, especially along the Bemiss Road corridor. Recent developments include fast-food restaurants, gas stations, and strip-malls. It is anticipated that commercial property development will continue along this corridor south of Moody AFB over the next several years.

- *Continued Management of Public Conservation Lands.* Two public conservation areas, the Grand Bay WMA (managed by the Georgia DNR) and the Banks Lake National Wildlife Refuge (managed by the USFWS), are located within the ROI immediately adjacent to Moody AFB. Wildlife conservation activities designed to promote the continued existence of native wildlife species will likely continue to be conducted on these areas in the future.

- *Remote Helicopter Landing Zones.* The USAF is currently evaluating the potential to acquire remote helicopter landing zones to facilitate search and rescue training in remote areas. This action would involve the use of one-acre sites for helicopter landing and personnel insertions and extractions. Currently, the plan is for the AF to locate and use previously disturbed areas to prevent further ground disturbance.

4.7.4 Cumulative Effects Analysis

None of the identified past, present, or reasonably foreseeable actions have been determined to cause significant effects on target or non-target species. The removal and addition of aircraft to the Moody AFB PAI and the creation of remote training areas (Gulf of Mexico water training area and remote helicopter landing zones) would not have a direct impact on target or non-target species; however, the increased utilization of the airspace within the ROI would increase the risk of a bird-aircraft collision.

Construction, both private and commercial, would likely be restricted to upland areas near major roads. There would be some loss of habitat for non-target species as a result of development, but most areas targeted for development have already been disturbed and are not considered quality wildlife habitat. There would be no loss of habitat for target species (vultures or cattle egrets) since no wetland areas would be developed. Conservation activities conducted on state and federal lands would have a positive effect on native wildlife species, but would probably not result in significant changes to current population levels over the long-term.

As part of implementation of the Moody AFB BASH management program, the depredation of up to 50 cattle egrets within the boundaries of Moody AFB was allowed under a MBTA permit. Wildlife Services personnel are also authorized to conduct depredation activities on the airfield under a separate MBTA permit. Depredations were conducted as part of the overall integrated BASH management program at Moody AFB, with the primary intent of depredations being to enforce non-lethal dispersal techniques and strategies. In fiscal year 2002 (October 2001 through September 2002), a total of 131 birds, primarily cattle egrets, were killed on Moody AFB while 4,975 birds were dispersed. This translates into a 97% non-lethal rate for the BASH program.

For purposes of analysis, it is assumed that no more than 150 cattle egrets would be killed annually within the boundaries of Moody AFB under previously approved authorizations and actions. Based on this assumption, the cumulative numbers of vultures and cattle egrets that would be killed (including the proposed action) would be 20 black vultures, 40 turkey vultures, and 400 cattle egrets within a five-mile radius of Moody AFB, including within the installation boundaries. Likewise, the cumulative numbers of vultures and cattle egrets that would be killed (including Alternative 3 -- Implementation of Lethal Strategies and Techniques) would be 225 black vultures, 300 turkey vultures, and 650 cattle egrets within a five-mile radius of Moody AFB, including within the installation boundaries. Since the numbers of black vultures and turkey vultures directly impacted would not increase from those evaluated in this document, there would be no significant cumulative impacts on these two species.

Cumulatively, the number of cattle egrets killed within the ROI would be substantially greater than those proposed solely under the proposed action or under Alternative 3. However, cattle egrets are common, non-native species that occur in great numbers and

forage widely on suitable habitat throughout the ROI. Additionally, cattle egrets are known to breed in many locations throughout the ROI and are not dependent on potential breeding sites within the proposed project area (five-mile radius around the Moody AFB airfield). Because of the vast acreages of suitable habitat within the ROI and the great reproductive potential of the cattle egret in this area and region-wide, there should not be any significant cumulative effects on cattle egret populations in the ROI, even though both the proposed action and Alternative 3 would result in fewer cattle egrets within the proposed project area.

Furthermore, vultures and cattle egrets and their eggs are only removed under MBTA depredation permits issued and monitored by the USFWS. The USFWS is the federal regulating authority for monitoring and managing vulture and cattle egret populations in the United States, including Georgia and Florida. The USFWS has the authority to limit the number of vultures, cattle egrets, and eggs taken under depredation permits, thereby limiting any potential cumulative adverse impacts to these bird species.

A summary of the predicted environmental effects and cumulative environmental effects for the proposed action and the alternatives is provided in Table 4-1.

Table 4-1 -- Predicted effects of each of the alternatives

Issues/Concerns	Alternative 1 – Integrated BASH Management Program (Proposed Action)	Alternative 2 – Non-lethal Techniques and Strategies Only	Alternative 3 - Lethal Techniques and Strategies Only	Alternative 4 - No Action Alternative
Effects on Target Bird Species Populations	Vulture and cattle egret populations within a five-mile radius of Moody AFB would be reduced and sustained at a lower level. No significant effect.	Vulture and cattle egret populations would continue to increase. Some population shifts would occur short-term. No significant effect.	Vulture and cattle egret populations within a five-mile radius of Moody AFB would be reduced and sustained at a lower level. No significant effect.	Vulture and cattle egret populations would continue to increase. No significant effect.
Effects on Non-target Populations, including RTE Species	No significant effect on non-target species populations. There may be a slight increase in native waterbirds and scavengers.	No significant effect on non-target species populations.	No significant effect on non-target species populations.	No significant effect on non-target species populations. However, reproduction by colonial waterbirds would continue to be affected by cattle egrets.
Effects of Damage to Property from Bird Strikes	Substantial decreases in property damage from bird strikes within five-mile radius of Moody AFB.	Short-term decreases in property damage. No long-term changes because of habituation and increasing target species populations.	Slight decrease in property damage from bird strikes, especially on Moody AFB property. Overall effect would not be significant.	Damage would remain the same or possibly increase.
Effects on Human Health and Safety	Substantial decrease in risk to pilots and aircraft personnel from bird strikes. No significant negative effects on public health and safety.	Slight decrease in risk to pilots and aircraft personnel from bird strikes short-term. No significant negative effects on public health and safety.	Slight decrease in risk to pilots and aircraft personnel from bird strikes short-term. No significant negative effects on public health and safety.	Threats to human health and safety would remain the same or possibly increase. No significant negative effects on public health and safety.

Table 4-1 (continued) -- Predicted effects of each of the alternatives

Issues/Concerns	Alternative 1 – Integrated BASH Management Program (Proposed Action)	Alternative 2 – Non-lethal Techniques and Strategies Only	Alternative 3 - Lethal Techniques and Strategies Only	Alternative 4 - No Action Alternative
Effects on Human Affectionate-Bonds with Individual Animals and on Aesthetic Values of Wildlife Species	No significant effect expected. Increases in native waterbirds populations expected as cattle egret numbers decrease. Some slight lessening of aesthetic values may occur as vulture and cattle egret numbers decrease, especially at Grand Bay WMA.	No significant effect expected.	No significant effect expected. Increases in native waterbirds populations expected as cattle egret numbers decrease. Some slight lessening of aesthetic values may occur as vulture and cattle egret numbers decrease, especially at Grand Bay WMA.	No significant effect expected. Some slight lessening of aesthetic values may occur as cattle egrets preclude breeding by native species.
Humaneness and Animal Welfare Concerns of Lethal Methods	Some concerns may be raised about lethal control. Effects would be mitigated to ensure humane killing of target species. No significant effects expected.	Some short-term disturbances may cause concern to some persons. No significant effects are expected.	Some concerns may be raised about lethal control. Effects would be mitigated to ensure humane killing of target species. No significant effects expected.	No significant effects are expected.
Cumulative Effects	Cumulatively, greater numbers of target species would be killed. However, there are no anticipated significant effects.	No cumulative effects.	Cumulatively, greater numbers of target species would be killed. However, there are no anticipated significant effects.	No cumulative effects.

5.0 PERMITS AND APPROVALS REQUIRED

A migratory bird depredation permit would be required from the U.S. Fish and Wildlife Service to conduct lethal depredation and harassment of vultures and cattle egrets since they are protected under the provisions of the MBTA; this permit would be obtained prior to implementation of the action. A state depredation permit would be obtained from the Georgia DNR to allow the depredation of vultures and cattle egrets. No other permits would be required.

Actions conducted by the AF on non-AF owned properties would require appropriate legal and real estate approvals, either consisting of Memorandum of Understandings (MOU), cooperative agreements, easements, or license agreements. No actions would be undertaken outside the installation boundary without landowner approval.

6.0 LIST OF AGENCIES CONSULTED

In accordance with Department of Defense, Air Force, federal and state regulations, the following agencies and interested persons will be consulted prior to implementation of the proposed action or any of the alternatives: Brunswick Field Office, U.S. Fish and Wildlife Service; Wildlife Resources Division, Georgia DNR; Georgia State Clearinghouse; Lowndes County Board of Commissioners; Lanier County Board of Commissioners; Valdosta City Council; and Dr. Brad Bergstrom, Valdosta State University.

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APPENDIX A

AGENCY CORRESPONDENCE

U.S. Fish and Wildlife Service

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

0 2 DEC 2003

MEMORANDUM FOR Mr. Robert Brooks
Acting Assistant Field Supervisor
U.S. Fish and Wildlife Service
4270 Norwich Street
Brunswick GA 31520

FROM: 347 CES/CC
3485 Georgia Street
Moody AFB GA 31699-1707

SUBJECT: Informal Consultation for Proposed Expansion of Bird-Aircraft Strike Hazard (BASH) Program at Moody AFB

1. Moody Air Force Base (AFB) requests an informal consultation as required by Section 7 of the Endangered Species Act for a proposed military project, the expansion of the BASH program at Moody AFB. The proposed action consists of the expansion of the existing BASH program to private and public lands within a five-mile radius of the Moody AFB airfield. Proposed activities include the application of integrated BASH techniques, including lethal and non-lethal techniques, to reduce the risk to pilots and aircraft from collisions with birds. In order to facilitate your review, the draft Environmental Assessment (EA) for this action is attached.

2. Two federally listed species, the bald eagle and the wood stork, have been occasionally sighted within the five-mile region of interest (ROI). However, there are no known nesting sites or important foraging areas for these species within the ROI. Implementation of BASH techniques would not take place when bald eagles or wood storks were present or around bald eagle or wood stork nesting sites if they were to develop in the future.

3. It is the opinion of our staff that this project will not jeopardize the continued existence of any listed species potentially occurring in the area. Therefore, we request your review and concurrence with the proposed military range project.

4. If you need any further information or if you have any questions, please contact Mr. Gregory Lee, (229) 257-5881, e-mail: gregory.lee@moody.af.mil.

DAVID L. CARLON, LT COL, USAF
Commander

Attachment:
Environmental Assessment

Combat Rescue – That Others May Live

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

247 South Milledge Avenue
Athens, Georgia 30605

West Georgia Sub Office
P.O. Box 52560
Ft. Benning, Georgia 31995-2560

Coastal Sub Office
4270 Norwich Street
Brunswick, Georgia 31520

JAN 14 2004

Lt. Colonel David L. Carlon
Department of the Air Force
347 Civil Engineer Squadron (ACC)
3485 Georgia Street
Moody Air Force Base, Georgia 31699-1707
Attn: Mr. Gregory W. Lee

Re: FWS Log # 04-0109

Dear Sir:

Thank you for your December 2, 2003, memorandum and draft environmental assessment concerning the proposed expansion of the Bird-Aircraft Strike Hazard (BASH) program at Moody Air Force Base (AFB), Georgia. The proposed action would expand the BASH program to private and public lands within a 5-mile radius of the Moody AFB airfield. Also, as a part of this action, Moody AFB proposes to add the turkey vulture and the black vulture to the list of species authorized to be lethally-controlled and to increase the number of cattle egrets authorized to be lethally-controlled as required to protect human health and aircraft. We have reviewed the information you provided and submit the following comments under provisions of the Endangered Species Act of 1973 (Act) as amended (16 U.S.C. 1531 et seq.).

According to the information you provided, the implementation of BASH techniques would not take place when bald eagles or wood storks are present or around their nesting sites. Currently, there are no known bald eagle or wood stork nesting sites within the 5 mile radius of the airfield; the closest known bald eagle nest site is about 6 miles east of the airfield on Banks Lake National Wildlife Refuge, and the closest wood stork nest site is approximately 12 miles west of the airfield. Therefore, we agree with your determination that this proposed project is not likely to adversely affect Federally endangered or threatened species. We believe that the requirements of section 7 of the Endangered Species Act have been satisfied and no further consultation is required.

We appreciate Moody AFB's efforts in keeping their aircraft at a safe distance away from these important nest sites, and the opportunity to comment during the planning stages of your project. If you have any questions, please write or call staff biologist Robert Brooks of our Brunswick office at (912) 265-9336.

Sincerely,

Sandra S. Tucker

Sandra S. Tucker
Field Supervisor

Georgia Department of Natural Resources

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

02 DEC 2003

MEMORANDUM FOR Mr. Tip Hon, Region Supervisor
Georgia Department of Natural Resources
1773-A Bowen's Mill Highway
Fitzgerald GA 31750

FROM: 347 CES/CC
3485 Georgia Street
Moody AFB GA 31699-1707

SUBJECT: Review of Proposed Military Action, the Expansion of the Bird-Aircraft Strike Hazard (BASH) Program at Moody AFB

1. Moody Air Force Base (AFB) proposes to expand the existing BASH program at Moody AFB to include private and public lands within a five-mile radius of the Moody AFB airfield. Proposed activities include the application of integrated BASH techniques, including lethal and non-lethal techniques, to reduce the risk to pilots and aircraft from collisions with birds. In support of this proposal, Moody AFB has prepared a draft final environmental assessment (EA) (Attachment).

2. Two federally listed species, the bald eagle and the wood stork, have been occasionally sighted within the five-mile region of interest (ROI). However, there are no known nesting sites or important foraging areas for these species within the ROI. Implementation of BASH techniques would not take place when bald eagles or wood storks were present or around bald eagle or wood stork nesting sites if they were to develop in the future.

3. The state-owned portion of the Grand Bay Wildlife Management Area (WMA) is included within the five-mile ROI, and a major portion of the proposed action consists of controlling vultures and cattle egrets utilizing the area for roosting and nesting. Therefore, we request your review of the proposed action as outlined in the attached EA. Comments will be addressed in the final EA for this project.

4. If this action is approved by the Moody AFB Commander for implementation, your office will be contacted to obtain the necessary approvals to conduct BASH management within the boundaries of Grand Bay WMA, probably as an addendum to our existing license agreement.

5. If you need any further information or if you have any questions, please contact Mr. Gregory Lee, (229) 257-5881, e-mail: gregory.lee@moody.af.mil.

DAVID L. CARLON, LT COL, USAF
Commander

Attachment:
Environmental Assessment

Georgia State Clearinghouse

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

MEMORANDUM FOR Georgia State Clearinghouse
Attn: Barbara Jackson
270 Washington St., SW, Eighth Floor
Atlanta GA 30334

FROM: 347 CES/CEV
3485 Georgia Street
Moody AFB GA 31699-1707

SUBJECT: Environmental Documents for Review and Comment

1. In accordance with 32 Code of Federal Regulations (CFR) 989, *The Environmental Impact Analysis Process*, three copies of the Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) for the proposed project, "Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program for Moody Air Force Base and Private and Public Lands Surrounding Moody Air Force Base, Georgia," are provided for your review and comment.

2. If you need any further information please contact Mr. Gregory Lee, (229) 257-5881, e-mail: gregory.lee@moody.af.mil. Thank you for your assistance.

JOHN B. MITCHELL
Environmental Flight Chief

Attachments:
Three (3) copies of FONSI and EA

Combat Rescue – That Others May Live

GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: John Mitchell
Dept. the Air Force
347 CES/CEV
3485 Georgia Street
Moody AFB, GA 31699-1707

FROM: Georgia State Clearinghouse

DATE: 11/26/2003

SUBJECT: Executive Order 12372 Review

APPLICANT: Department of the Air Force - Moody AFB, GA

PROJECT: EA/FONSI: Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program -- Moody AFB, GA (and surrounding lands)

CFDA #:

STATE ID: GA031126001

FEDERAL ID:

Correspondence related to the above project was received by the Georgia State Clearinghouse on 11/26/2003. The review has been initiated and every effort is being made to ensure prompt action. The proposal will be reviewed for its consistency with goals, policies, plans, objectives, programs, environmental impact, criteria for Developments of Regional Impact (DRI) or inconsistencies with federal executive orders, acts and/or rules and regulations, and if applicable, with budgetary restraints.

The initial review process should be completed by 12/24/2003 (*approximately*). If the Clearinghouse has not contacted you by that date, please call (404) 656-3855, and we will check into the delay. We appreciate your cooperation on this matter.

In future correspondence regarding this project, please include the State Application Identifier number shown above. If you have any questions regarding this project, please contact us at the above number.

Form SC-1
April 2003

Office of Planning and Budget

Sonny Perdue
Governor

Timothy A. Connell
Director

GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: John Mitchell
Dept. the Air Force
347 CES/CEV
3485 Georgia Street
Moody AFB, GA 31699-1707

FROM: Barbara Jackson
Georgia State Clearinghouse

DATE: 12/16/2003

SUBJECT: Executive Order 12372 Review

PROJECT: EA/FONSI: Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program -- Moody AFB, GA (and surrounding lands)

STATE ID: GA031126001

CFDA#:

The State level review of the above referenced document has been completed. As a result of the environmental review process, the activity this document was prepared for has been found to be consistent with state social, economic, physical goals, policies, plans, and programs with which the State is concerned.

Additional Comments:

The applicant is advised to note additional comments from South Georgia RDC.

/bj
Enc.: South Georgia RDC, Dec. 15, 2003
Wildlife Resources Div, Dec. 16, 2003

Form SC-4-EIS-4
January 1995

GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: MR. D. SUTTON
SOUTH GEORGIA RDC

SUBJECT: Executive Order 12372 Review

PROJECT: EA/FONSI: Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program -- Moody AFB, GA (and surrounding lands)

STATE ID: GA031126001

DATE: 12-12-03

☒ This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This notice is not consistent with:

☐ The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies).

☐ The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies).

☐ This notice does not impact upon the activities of the organization.

Form SC-3
January 1995

Please see attached report from GLPC and review from Lowndes County Engineer

RECEIVED
DEC 15 2003
GEORGIA
STATE CLEARINGHOUSE

SOUTH
GEORGIA
REGIONAL
DEVELOPMENT
CENTER

An Equal Opportunity Employer/Program

MEMORANDUM

TO: Mr. Alan Sloan, Comprehensive Planner, South Georgia RDC

FROM: David J. Sutton, Intergovernmental Review Coordinator
South Georgia RDC - Regional Clearinghouse
P. O. Box 1223
Valdosta, GA 31603

RE: Receipt of Notification of Intent to Apply for Federal Assistance/
Preapplication/Application/Proposed Permit/Direct Federal Development

DATE: December 2, 2003

APPLICANT: Department of the Air Force

PROJECT: Implementation of Expanded Bird-Aircraft Strike Hazard Program - Moody AFB, GA

STATE CLEARINGHOUSE CONTROL NO.: GA-031126001

FEDERAL ID NO.

SUBJECT: Executive Order 12372 Review

In order to comply with Executive Order 12372, we have enclosed a copy of the applicant's Intergovernmental Coordination Form for your review. Your review should focus on the application's compatibility with the plans, programs, and objectives of your agency.

Please return this form by **12-12-03** with your comments, negative comments, or questions about the project.

****

This project is compatible with the plans, programs and objectives of this agency: X

This project is **NOT** compatible with the plans, programs, and objectives of this agency: _____

This agency has questions concerning the enclosed project: _____

This agency wishes to confer with the applicant: _____

COMMENTS:

RC Form 2

327 W. Savannah Ave
Valdosta, GA 3160
Phone 229 333 527
Fax 229 333 531
SGRDC@SGRDC.com

G L
P C **Greater Lowndes Planning Commission**

Lowndes County *City of Valdosta* *City of Dasher* *City of Hahira* *City of Lake Park*

MEMORANDUM

TO: David J. Sutton, Intergovernmental Review Coordinator

FROM: R. Alan Sloan, MPA
Comprehensive Planner RAS

RE: Expanded Bird-Aircraft Strike Hazard (BASH) Program – Moody Air Force Base, GA

DATE: December 4, 2003

We have received the information for intergovernmental review of a proposed expansion of the Bird-Aircraft Strike Hazard (BASH) Program for Moody Air Force Base (MAFB). The program includes lethal and non-lethal measures to minimize the risks of birds striking aircraft at any time during takeoff, flight and landing. Non-lethal methods include prediction of bird occurrence by utilizing bird avoidance models prepared for MAFB; forage reduction through mowing and removal of carrion and dead livestock; dispersal techniques (harassment) including chasing away, pyrotechnics, propane gas cannons, and bioacoustics; and nest destruction of cattle egret nests prior to laying of eggs. Lethal measures will include addling, destruction, and oiling of cattle egret eggs and shooting and/or trapping and euthanasia, which will be used as a last resort to harassment. The physical boundaries of the program include lands within the borders of MAFB, as well as land within a five-mile radius of the Base. Any measures taken outside of the boundaries of the Base would be subsequent to permission from the property owner.

Moody does have agreements with landowners surrounding the base that help to control the bird population in the area, including items such as removal of dead livestock by the owner within 24 hours of discovery. These measures, however, have not proven to be enough to discourage bird population surrounding the base. The problem lies in the overall population of birds that could cause significant damage to the aircraft, as well as endangering the pilot. Single larger birds, such as the black and turkey vultures, cattle egrets, great blue herons, etc. can cause significant damage to an aircraft and can endanger the life of the pilot by striking the aircraft in the wrong manner. It is reported that, in April 2001, a great blue heron flew into the path of a landing AT-38B fighter trainer aircraft, was ingested into the engine and caused $49,000 in damage. It was stated that, if the aircraft had been traveling five knots slower, then it would have resulted in total loss of the aircraft. Since that date, an estimated $115,000 in damage to aircraft has occurred due to bird strikes at and around MAFB. While strikes by single smaller birds more often than not go unnoticed until post-flight inspections reveal remains of the bird, large flocks of these birds, which do occur near MAFB, can still cause significant damage. MAFB reports an average of 23.5 bird strikes annually and, while there have been no fatalities reported at the base due to bird strikes since 1987, the potential is there.

Moody staff evaluated three alternatives to this proposed action. The first was sole implementation of non-lethal strategies. This was deemed ineffective in that it was reported that vultures do not always respond to available non-lethal methods. The second was sole implementation of lethal techniques. This was deemed ineffective in that it would only eliminate existing population and would do nothing to discourage new birds from coming in. The third alternative was the no-action alternative, leaving existing measures in place, which are proving not to be enough at their current level. Other alternatives were rejected because they were deemed infeasible, impractical, or ineffective. These included lethal removal of all bird species in known roosts, removal of aircraft from MAFB, use of chemical repellants, use of ultrasonic devices, and live trapping and re-location of cattle egrets. These measures were not evaluated in the environmental assessment. The proposed action focuses primarily on cattle egrets and black and turkey vultures. The environmental effects are limited to simply forcing certain species of birds to not nest or come near the base's airfield. There are many other areas suitable for all relevant species within the area that would not be detrimental to the mission of MAFB. It was determined that the proposed action will achieve the stated program's purposes and will not have a significant effect on the overall population of either species. Therefore, staff believes that this project is compatible with the plans, programs and objectives of this agency.

P.O.Box 1223 327 West Savannah Avenue Valdosta, Georgia 31603-1223 Telephone: (912) 333-5277 FAX: (912) 333-5312

SOUTH
GEORGIA
REGIONAL
DEVELOPMENT
CENTER

An Equal Opportunity Employer/Program

MEMORANDUM

TO: Mr. Joe Pritchard, Lowndes County Engineer

FROM: David J. Sutton, Intergovernmental Review Coordinator
South Georgia RDC - Regional Clearinghouse
P. O. Box 1223
Valdosta, GA 31603

RE: Receipt of Notification of Intent to Apply for Federal Assistance/ Preapplication/Application/Proposed Permit/Direct Federal Development

DATE: December 2, 2003

APPLICANT: Department of the Air Force

PROJECT: Implementation of Expanded Bird-Aircraft Strike Hazard Program - Moody AFB, GA

STATE CLEARINGHOUSE CONTROL NO.: GA 031126001

FEDERAL ID NO.

SUBJECT: Executive Order 12372 Review

In order to comply with Executive Order 12372, we have enclosed a copy of the applicant's Intergovernmental Coordination Form for your review. Your review should focus on the application's compatibility with the plans, programs, and objectives of your agency.

Please return this form by **12-12-03** with your comments, negative comments, or questions about the project.

****

This project is compatible with the plans, programs and objectives of this agency: ✓

This project is **NOT** compatible with the plans, programs, and objectives of this agency: _____

This agency has questions concerning the enclosed project: _____

This agency wishes to confer with the applicant: _____

COMMENTS:

County Engineer
12/11/03

RC Form 2

327 W. Savannah Ave.
Valdosta, GA 31601
Phone 229 333 5277
Fax 229 333 5312
SGRDC@SGRDC.com

GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: MR. NOEL HOLCOMB
WILDLIFE RESOURCES DIVISION

SUBJECT: Executive Order 12372 Review

PROJECT: EA/FONSI: Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program -- Moody AFB, GA (and surrounding lands)

STATE ID: GA031126001

DATE: December 15, 2003

☒ This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This notice is not consistent with:

☐ The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies).

☐ The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies).

☐ This notice does not impact upon the activities of the organization.

Form SC-3
January 1995

RECEIVED
DEC 16 2003
GEORGIA
STATE CLEARINGHOUSE

Other Agencies

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

MEMORANDUM FOR All Interested Government Agencies, Organizations, and Individuals

FROM: 347 CES/CEV

SUBJECT: Review of Draft Environmental Documents for Moody Air Force Base (AFB), Georgia

1. Moody AFB has prepared a draft environmental assessment (EA) analyzing the potential environmental impacts of the implementation of an expanded bird-aircraft strike hazard (BASH) program on Moody AFB and on private and public lands surrounding the installation. The EA assesses potential impacts of the proposed action and alternatives, including the no-action alternative. The initial assessment resulted in a finding of no significant impact (FONSI) for the proposed action.

2. This document is being sent to you for review and comment because you have been identified as a party interested in proposed activities occurring on or near Moody AFB, Georgia.

3. Please provide any comments on the analysis presented in the draft EA by 19 Dec 2003 to Mr. Gregory W. Lee, 347 CES/CEVA at either 3485 Georgia Street, Moody AFB, GA 31699-1707 or by e-mail at gregory.lee@moody.af.mil. Mr. Lee can also be contacted by telephone at (229) 257-5881.

4. If you no longer wish to receive these documents for review, please contact Mr. Lee by one of the above means to have your name removed from the mailing list.

JOHN B. MITCHELL
Environmental Flight Chief

Attachment:
Draft EA and FONSI

Combat Rescue – That Others May Live

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

MEMORANDUM FOR Lanier County Board of Commissioners
100 Main Street
County Courthouse
Lakeland GA 31635

FROM: 347 CES/CEV
3485 Georgia Street
Moody AFB GA 31699-1707

SUBJECT: Environmental Documents for Review and Comment

1. In accordance with 32 Code of Federal Regulations (CFR) 989, *The Environmental Impact Analysis Process*, we are providing you with a copy of the Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) for the proposed project, "Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program for Moody Air Force Base and Private and Public Lands Surrounding Moody Air Force Base, Georgia," for your review and comment.

2. All comments must be received by close of business, 19 Dec 03. If you have any questions or need any further information please contact Mr. Gregory Lee, (229) 257-5881, e-mail: gregory.lee@moody.af.mil. Thank you for your assistance.

JOHN B. MITCHELL
Environmental Flight Chief

Attachments:
FONSI and EA

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

MEMORANDUM FOR City of Valdosta
316 East Central Avenue
Valdosta GA 31601

FROM: 347 CES/CEV
3485 Georgia Street
Moody AFB GA 31699-1707

SUBJECT: Environmental Documents for Review and Comment

1. In accordance with 32 Code of Federal Regulations (CFR) 989, *The Environmental Impact Analysis Process*, we are providing you with a copy of the Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) for the proposed project, "Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program for Moody Air Force Base and Private and Public Lands Surrounding Moody Air Force Base, Georgia," for your review and comment.

2. All comments must be received by close of business, 19 Dec 03. If you have any questions or need any further information please contact Mr. Gregory Lee, (229) 257-5881, e-mail: gregory.lee@moody.af.mil. Thank you for your assistance.

JOHN B. MITCHELL
Environmental Flight Chief

Attachments:
FONSI and EA

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

MEMORANDUM FOR Lowndes County Board of Commissioners
325 West Savannah Avenue
Valdosta GA 31601

FROM: 347 CES/CEV
3485 Georgia Street
Moody AFB GA 31699-1707

SUBJECT: Environmental Documents for Review and Comment

1. In accordance with 32 Code of Federal Regulations (CFR) 989, *The Environmental Impact Analysis Process*, we are providing you with a copy of the Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) for the proposed project, "Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program for Moody Air Force Base and Private and Public Lands Surrounding Moody Air Force Base, Georgia," for your review and comment.

2. All comments must be received by close of business, 19 Dec 03. If you have any questions or need any further information please contact Mr. Gregory Lee, (229) 257-5881, e-mail: gregory.lee@moody.af.mil. Thank you for your assistance.

JOHN B. MITCHELL
Environmental Flight Chief

Attachments:
FONSI and EA

APPENDIX B

PUBLIC COMMENTS AND
RESPONSE TO COMMENTS

Lee Gregory W Civ 347CES/CEV

From: Mary Anna [maryanna@vol.com]
Sent: Monday, December 08, 2003 4:28 PM
To: gregory.lee@moody.af.mil
Subject: BASH Program

Mr. Lee,

I have to strongly disagree with the BASH Program. Our nature reserves are limited now and do not need to be encroached upon anymore. Usually the damage to our environment and it's inhabitants is not realized....until it's too late.

But mostly....I would not wish even one pilot to be harmed from flying fowl within their air space....But these men are in training. They have to learn to respond very quickly to any situation that arises. If deployed to an area in conflict they have to be prepared for such things as a group of birds taking flight within their path. I would rather they experience that here, in peace, at home...in training....than in an air strike in hostile territory. So for the benefit of the pilots and the birds .....please leave things alone as they now stand.

I know that a bird striking an aircraft can probably cause a lot of monetary damage, but Moody knew the territory before they moved in. Let's not do our nature reserve like the English treated the Indians when we first came to America....pushing their boundaries back to the point of no return! Let's learn our lessons from history!

Thank you for allowing me to voice my opinion.

Mary Anna Mathis
Rt. 2 Box 960
Lakeland, GA. 31635
229-482-2833

Lee Gregory W Civ 347CES/CEV

From: Nick Norton [norton_n@bellsouth.net]
Sent: Thursday, January 01, 2004 8:20 PM
To: Greg Lee
Subject: BASH Program

Dear Mr. Gregory W. Lee:

As manger for Norton Farms, I must file an objection and complaint of **disapproval** on your BASH Program that Moody AFB intends to implement within the boundaries of the USFWS Banks Lake National Wildlife Refuge, Georgia Department of Natural Resources, Wildlife Management Area, at Grand Bay and other public properties that would be affected by this program.

In our opinion, your plan will affect much more than the immediate area you wish to eradicate of particular birds and or wildlife. We feel you plan has not been thought through as well as it should be and would affect both wildlife on private lands and public properties. This is not acceptable and will be resisted strongly. Low flying and continuous noise generated by aircraft that use the Moody AFB facility already affect our property values in a negative manner. It limits the use of private lands, places revenue restrictions on our private property and is generally disruptive to our normal ways of life.

Naturally, we feel that safety is priority for pilots, aircraft and the citizens that Moody flies above but these same citizens also pay for the wildlife and wild places that have been placed in your care, through public tax dollars. Moody AFB *should* be a leading steward of the community and the environment(s) they occupy and must act in ways that justify and sustain that confidence, if they are to remain in these environmentally sensitive areas.

As private landowners, we would seek property damages, property value loss and other compensations for any actions that will further affect our private property, such as the proposed BASH Program.

Sincerely,

Charles N. Norton
c/o Norton Farms
5704 Byrd Lane
Naylor, Georgia 31641
229-242-0678
norton_n@bellsouth.net

Lee Gregory W Civ 347CES/CEV

From: Ann Lee [ealee@alltel.net]
Sent: Friday, January 02, 2004 12:00 AM
To: Gregory Lee
Subject: Bashprogram

Ann Lee
Route 1 Box 3A
Lakeland, GA 31635
229/482-3835
email: ealee@allte.net

Mr. Gregory W. Lee:

We would like to register our opposition to the Bash program Moody Air Force Base currently intends to impose on properties within a five-mile radius of its airfield. This plan is not acceptable to adjoining landowners or interested citizens. The proposed plan does not appear to affect wetlands and plant life but will destroy the delicate balance of flora and fauna; and we suspect, in an area much larger than suggested in the Moody plan.

Banks Lake and Grand Bay Refuge offer a rare and valuable resource for wildlife. They were taken under the management of our state and federal governments in the early eighties to offer protection to wildlife and endangered species. The Georgia Natural Resources Wildlife Management has protected and developed this environmentally sensitive area for public use. The Bash plan will devastate a large wildlife habitat in an effort to control cattle egrets and vultures that sometimes offer a threat to aircraft and pilots. We do not suggest that pilot and aircraft safety is not a valid concern but we do propose that the Bash method is too extreme.

As managers or owners of properties that adjoin the Grand Bay and Banks Lake Management Areas we believe the value of properties will be negatively effected and will strongly oppose and resist efforts by Moody AFB to implement the proposed programs. Furthermore, we will seek compensation for those property damages if these programs are implemented.

Sincerely;

Trustee for Salva Children's Trust
Larry Lee Trustee, Georgia Salve, Trevor Salva, Bob Salva, Frank Salva

Simpson Farms
Tommy Simpson, Bert Simpson, Harold Simpson, Ann Simpson Lee,
Patti Simpson

GRAM Corporation
Georgia Salva

Cabin Owner
Larry Lee

Lee Gregory W Civ 347CES/CEV

From: Ann Lee [ealee@alltel.net]
Sent: Friday, January 02, 2004 9:55 AM
To: Gregory Lee
Subject: Bash

Ann Lee
Route 1 Box 3A
Lakeland, GA 31635
229/482-3835
email: ealee@allte.net

Mr. Gregory W. Lee:

This note is sent as further explanation of our reaction and concern over the Moody AFB Bash program. Moody has always presented itself as a steward to surrounding communities. One article in a newspaper, a packet of information in a public library, and a comment deadline called a **drop dead date** do not make a good impression. Articles in papers are not adequate notification to landowners of programs that may affect their properties no matter how minor that involvement may be. Our reaction would not have been so direct and heated if landowners had received a courtesy letter of explanation or the offer of a meeting to explain exactly what a Bash program involves. Exactly what are lethal and non lethal Bash strategies?

A copy of your FONSI and EA have been given to Representative Jay Shaw for review. Hopefully we can get a quick understanding of our involvement with the BASH program and get this matter behind us.

Sincerely:

Trustee for Salva Children's Trust
Larry Lee Trustee, Georgia Salva, Trevor Salva, Bob Salva, Frank Salva

Simpson Farms
Tommy Simpson, Bert Simpson, Harold Simpson, Ann Simpson Lee,
Patti Simpson

GRAM Corporation
Georgia Salva

Cabin Owner
Larry Lee

DEPARTMENT OF THE AIR FORCE
347TH CIVIL ENGINEER SQUADRON (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

MEMORANDUM FOR RECORD

JAN 07 2004

FROM: 347 CES/CEVA

SUBJECT: Response to Comments Received on the Draft Final Environmental Assessment (EA), *Implementation of Expanded Bird-Aircraft Strike Hazard (BASH) Program for Moody Air Force Base and Private and Public Lands Surrounding Moody Air Force Base, Georgia*, September, 2003

1. In accordance with the National Environmental Policy Act, Council of Environmental Quality guidance, and 32 Code of Federal Regulations, *The Environmental Impact Analysis Process*, the draft final EA and unsigned finding of no significant impact (FONSI) were made available to the public for review and comment for a 30-day period.

a. The notice of availability was published in the Valdosta Daily Times on 23 November 2003. The notice of availability was published in the Lanier County News on 20 November 2003.

b. The official public comment period ended on 23 December 2003. However, because of the holiday season, written comments were accepted through 2 January 2004.

2. Four written comments from three individuals on the proposed action were received via e-mail (attachments 1-4):

a. Mary Anna Mathis, Lakeland, GA, comment received 8 December 2003.

b. Charles N. Norton, Naylor, GA, comment received 1 January 2004.

c. Ann Lee, Lakeland, GA, two comments received 2 January 2004.

3. Concerns raised in these comments were similar.

a. Concern: Natural resources within the Grand Bay Wildlife Management Area (WMA) and Banks Lake National Wildlife Refuge (NWR) would be significantly impacted as a result of the proposed action. Moody AFB Response: The potential impacts to natural resources as a result of implementation of the proposed action were sufficiently analyzed in the EA and were deemed to be non-significant at the population level. The proposed action was carefully defined to minize effects on non-target species, and there should be no significant impacts to wildlife or flora as a result of implementation of this action. This concern was identified and adequately addressed in the EA.

b. Concern: The proposed action would significantly affect wildlife populations on private lands surrounding Moody AFB, resulting in private property value loss and other

negative effects on private property. Moody AFB Response: The majority of actions identified in the EA for implementation would occur on state and federal lands and not on private property. Written permission from private landowners in the form of Rights of Entry, Easements, or other legal documents would be sought prior to implementation of any actions on private lands. Additionally, the limited focus of the EA on cattle egrets and vultures would not result in any effects on non-target species and would not significantly affect wildlife populations on private lands. This concern was identified and adequately addressed in the EA.

Gregory W. Lee

GREGORY W. LEE
Chief, Analysis, Plans, and Programs Element
Moody AFB Environmental Flight

Attachments:
1. Comment from Mary Anna Mathis, Lakeland, GA
2. Comment from Charles N. Norton, Naylor, GA
3. Comment from Ann Lee, Lakeland, GA
4. Comment from Ann Lee, Lakeland, GA

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 347TH RESCUE WING (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

APR 02 2004

MEMORANDUM FOR Charles N. Norton
c/o Norton Farms
5704 Byrd Lane
Naylor GA 31641

FROM: 347 RQW/CV

SUBJECT: Proposal to Implement Expanded Bird-Aircraft Strike Hazard (BASH) Program, Moody Air Force Base (AFB)

1. One of my responsibilities as the chairperson of the Moody AFB Environmental Protection Committee is the protection and preservation of our environment and our natural heritage. We strive to be good stewards of the environment and to conduct our military mission requirements in such a manner that leaves the environment in a pristine condition for future generations.

2. As part of our commitment to protect and preserve the environment, Moody AFB prepared a draft environmental assessment and finding of no significant impact for the proposed implementation of an expanded BASH program. These documents were then made available to federal and state agencies, non-governmental organizations, and private citizens for review and comment. You were one of the concerned citizens who provided comments on these documents and on the proposed action.

3. I would like to personally thank you for the comments that you provided. Your comments will be evaluated and considered prior to any decision being made regarding the proposed action. It is only through public participation in the decision-making process that we can ensure we have adequately addressed the potential environmental effects from proposed actions.

HOWARD SHORT, Colonel, USAF
Vice Commander

Combat Rescue – That Others May Live

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 347TH RESCUE WING (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

APR 02 2004

MEMORANDUM FOR Mary Anna Mathis
Rt. 2 Box 960
Lakeland GA 31635

FROM: 347 RQW/CV

SUBJECT: Proposal to Implement Expanded Bird-Aircraft Strike Hazard (BASH) Program, Moody Air Force Base (AFB)

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HOWARD SHORT, Colonel, USAF
Vice Commander

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 347TH RESCUE WING (AFSOC)
MOODY AIR FORCE BASE, GEORGIA

MEMORANDUM FOR Ann Lee
Route 1 Box 3A
Lakeland GA 31635

APR 0 2 2004

FROM: 347 RQW/CV
5113 Austin Ellipse Suite 6
Moody AFB GA 31699-1599

SUBJECT: Proposal to Implement Expanded Bird-Aircraft Strike Hazard (BASH) Program, Moody Air Force Base (AFB)

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