NPSI-1020-002.4

NPSI RSDM 2.4

NAVAIR PORTABLE SOURCE INITIATIVE (NPSI) STANDARD FOR REUSABLE SOURCE DATASET METADATA (RSDM)

Prepared For:

Common Simulation Products (CSP)
NAVAIR Aviation Training Systems PMA 205

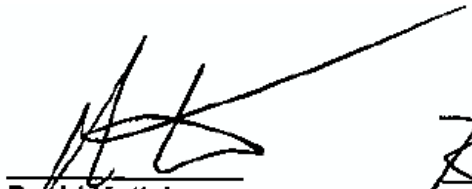
Prepared By:

NPSI Team
NAWC TSD
12350 Research Parkway
Orlando, FL 32826-3276

Document Date: **26 SEPT 2012**

\\UNCLASSIFIED

DISTRIBUTION STATEMENT A: Approved for Public Release: Distribution Unlimited



David Kotick
Chief M&S Engineer – Advanced Simulation, Visual & Software Systems Division

Ronald Wolff
Chief Visual Engineer– Visual and Sensor Simulation Branch

Kerey Howard
NPSI Lead Engineer– Visual and Sensor Simulation Branch

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
26-09-2012	STANDARD	June 2009 – September 2012

4. TITLE AND SUBTITLE
NAVAIR Portable Source Initiative (NPSI) Standard for Reusable Source Dataset Metadata (RSDM) V2.4

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Howard, Kerey
Riner, Bruce

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
NAWCTSD, Advanced Simulation, Visual & Software Systems Division,
12350 Research Parkway
Orlando, FL 32826

8. PERFORMING ORGANIZATION REPORT NUMBER
NPSI-1020-002.4

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Common Simulation Products
NAVAIR Aviation Training Systems: Program Manager Air 205

10. SPONSOR/MONITOR'S ACRONYM(S)
CSP
PMA 205

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release: Distribution unlimited, as submitted under NAVAIR Public Release Authorization 12-ORL112801.

13. SUPPLEMENTARY NOTES

14. ABSTRACT
The mission of NPSI is to provide maximum database reuse across Type/Model/Series platforms to lower the life cycle cost of out-the-window visual terrain, 3-D models, and sensor databases, also adding dataset archive capability, and short-notice distribution services. The metadata and metadata architectures are used to facilitate data discovery, data understanding, and effective data distribution. The metadata is also employed for NPSI dataset archiving and distribution. This document describes the metadata schema specified for NPSI data interchange.

15. SUBJECT TERMS
NPSI, Standard, Imagery, Elevation, 3D-Models, Reuse, Metadata, Database, Dataset

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**	SAR (Same as Report)	145	**19b. TELEPHONE NUMBER** *(include area code)*
(U)	(U)	(U)			

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

Table of Contents

List of Figures

1. Introduction

NPSI is a simple concept with the goal of minimizing waste and redundancy in database production without inhibiting innovation. The basic concept of NPSI is to capture value added work performed on raw source data. This concept has resulted in significant cost savings to many Department of Defense (DoD) programs by minimizing the amount of raw source data required to be purchased and processed. The NPSI archive stores refined source data in datasets and makes the datasets available for utilization by future programs.

1.1 NPSI Metadata

The intent of the NPSI metadata is to contain metadata information that accompanies a simulation dataset distribution to programs. The metadata should contain enough application information to assist in ingesting the dataset by a runtime database generator.

Based on eXtensible Markup Language (XML) technology, the intent of the NPSI metadata is to be extensible, allowing new definitions of data types and applications to be added progressively. However, the data structure must conform to a universal standardized format to allow interoperability and data interchange with minimum intervention. The structural definition, logical relationships, and business rules of a database is summarized in a "schema". In XML technology, a schema is also a validating document that defines the "grammar" of an XML document. When an XML database document is validated against a schema, the structural conformity and business rules are enforced.

As an example, consider the following XML formatted data for defining a raster file format:

```
<RasterFileFormat>
  <FormatName>TIFF</FormatName>
  <Order>BIP</Order>
  <DataType>8-BIT_UNSIGNED</DataType>
  <Orientation>UPPER_LEFT</Orientation>
  <NumChannels>3</NumChannels>
  <CompressionType>NONE</CompressionType>
  <Size XSize="12550" YSize="12550"/>
  <Channel channel_num="3">
    <Color ColorSpace="RGB" Name="R"/>
  </Channel>
  <Channel channel_num="2">
    <Color ColorSpace="RGB" Name="G"/>
  </Channel>
  <Channel channel_num="1">
    <Color ColorSpace="RGB" Name="B"/>
  </Channel>
</RasterFileFormat>

<TargetResolution value="0.6" unit="METERS"/>
<Georeference>
    <SpatialReference>
      <Geographic>
        < LatitudeResolution unit="ARCDEG" " value ="4.4915764E-05"/>
        < LongitudeResolution unit=" ARCDEG" value="4.4915764E-05"/>
      </Geographic>
      <Geodetic>
        <Datum>WGS84</Datum>
        <Ellipsoid>WGS_1984</Ellipsoid>
      </Geodetic>
    </SpatialReference>
    <SpatialDomain>
      <UpperLeft>
        <XCoordinate unit="DEGREES_LATLON" value="-114.50179663056"/>
```

```
      <YCoordinate unit="DEGREES_LATLON" value="35.5017966305682"/>
    </UpperLeft>
    <UpperRight>
      <XCoordinate unit="DEGREES_LATLON" value="-113.99824599805”/>
      <YCoordinate unit="DEGREES_LATLON" value="35.5017966305682"/>
    </UpperRight>
    <LowerLeft>
      <XCoordinate unit="DEGREES_LATLON" value="-114.501796630568"/>
      <YCoordinate unit="DEGREES_LATLON" value="34.9982459980548"/>
    </LowerLeft>
    <LowerRight>
      <XCoordinate unit="DEGREES_LATLON" value="-113.99824599805”/>
      <YCoordinate unit="DEGREES_LATLON" value="34.998245998054"/>
    </LowerRight>
  </SpatialDomain>
</Georeference>
```

The focus of XML schema is the data and the structure of the data. The meaningful nature of the components promotes the interchangeability of the data across heterogeneous platforms. The self-documentation and structure preservation inherent in XML facilitates interoperability between applications, as desired under the NPSI program.

2. Organization of the Data

2.1 NPSI Datasets

NPSI datasets are distinguished from RAW source data collections by the amount of refinement that has been completed before acceptance into the NPSI archive. These refinements include workflow data and metadata. Only the most processed versions of each data element will be present in the NPSI dataset. For dataset distributions, NPSI metadata must accompany the set to instruct database production systems how to interpret each of the objects and layers in the dataset. The metadata document for dataset distribution will follow the NPSI schema NPSI Standard for Reusable Source Dataset Metadata NPSI-1020-002.4 (this document). In summary, the objective of NPSI metadata is to document the contents of the dataset and to reduce pre-processing time and effort in creating databases from NPSI datasets.

2.2 NPSI Data Folder Structure

When data is to be distributed, the data will be exported from the NPSI archive into a file-based dataset. The accompanying NPSI metadata references the file paths and file names of the data files. Data types are distributed using a descriptive file folder name and structure.

2.3 Data Packaging

NPSI dataset is delivered as a set of folders. An example of the folder is shown below in Figure 1.

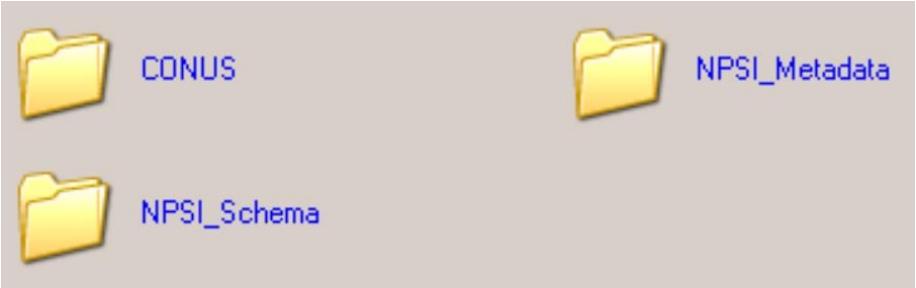


Figure 1 NPSI Package.

NPSI_Metadata

This is the main folder that stores all NPSI metadata in XML format. Included in the XML folder are style-sheets that may be used to display the XML data with *Internet Explorer*.

CONUS

This is the root folder for Continental United States datasets that stores all data files being distributed with the metadata. The folders underneath are organized by geographical locations and data types (raster, vectors and cultural features). The attached example only contains the folder structure and thumbnail files for visual raster data.

NPSI_Schema

This folder stores the schema used to validate and load the metadata XML files.

3. Illustrative Examples

The following metadata examples, shown in Figure 2 thru Figure 7, were created using the NPSI schema documented in this standard. The illustrations were captured from web browser renderings of NPSI XML files using an XML style-sheet. Note that not all of the data in the NPSI metadata are displayed by the style-sheet used.

3.1 NPSI Metadata Example for Town of Mercury Dataset

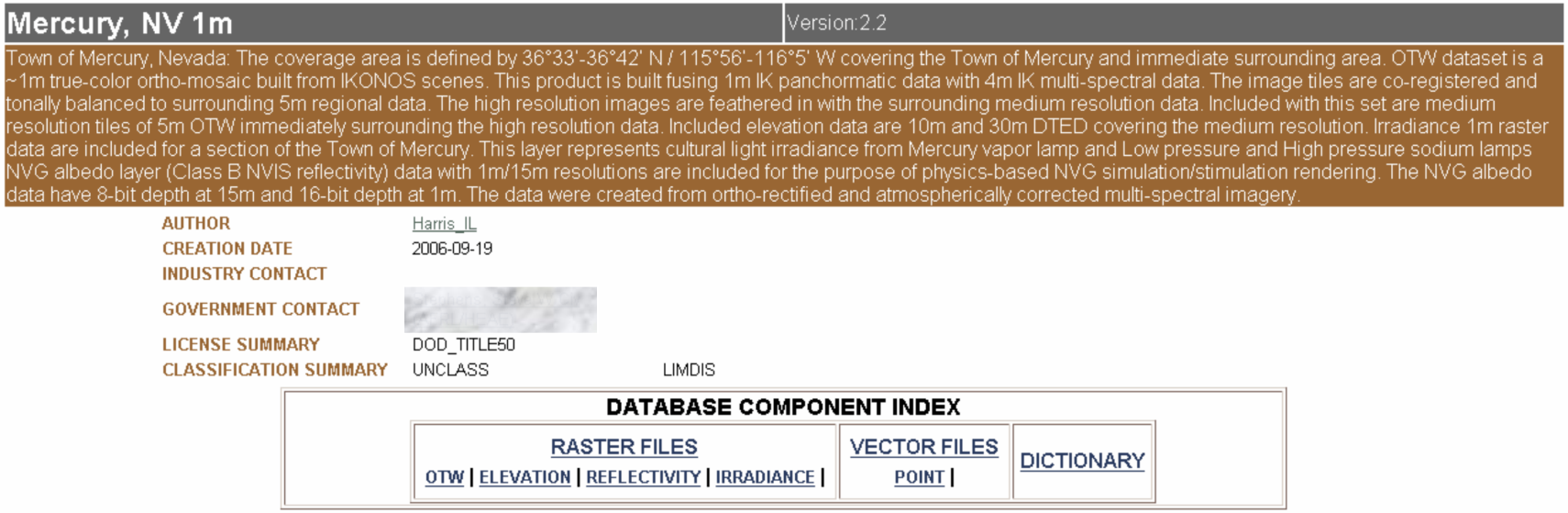


Figure 2 NPSI metadata example: Identification information section.

RASTER TYPE **OTW**
FILENAME **MERCURY_1M_0002.TIF**
RELATIVE PATH \CONUS\W\USA\Nevada\Mercury\Raster\OTW\1m\

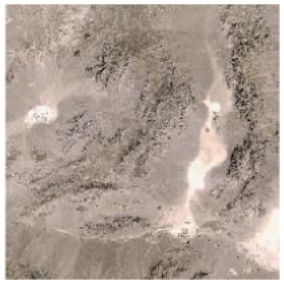
RESOLUTION 1_METERS

FILE FORMAT INFORMATION	
FORMAT NAME	TIFF
ORDER	BIP
DATA TYPE	8-BIT_UNSIGNED
ORIENTATION	UPPER_LEFT
PIXEL DIMENSIONS	8050 x 8050
CHANNELS	
# CHANNELS	3
COLOR CHANNEL	
COLOR SPACE	RGB
CHANNEL_0	B
CHANNEL_1	G
CHANNEL_2	R

ORTHO GEOGRAPHIC REFERENCE		
LOWERLEFT		
LONGITUDE	-116.08702041225	DEGREES_LATLON
LATITUDE	36.5581442297262	DEGREES_LATLON
LOWERRIGHT		
LONGITUDE	-116.014715015033	DEGREES_LATLON
LATITUDE	36.5581442297262	DEGREES_LATLON
UPPERRIGHT		
LONGITUDE	-116.014715015033	DEGREES_LATLON
LATITUDE	36.6304496269434	DEGREES_LATLON
UPPERLEFT		
LONGITUDE	-116.08702041225	DEGREES_LATLON
LATITUDE	36.6304496269434	DEGREES_LATLON
X PIXEL		
Y PIXEL		
UTM ZONE		
DEGREE PER PIXEL	8.9831528E-006	DEGREES_LATLON

Figure 3 NPSI metadata example: 1m Out-the-Window raster data.

RASTER TYPE **OTW**
FILENAME **N3630W11530.tif**
RELATIVE PATH \CONUS\W\USA\Nevada\Statewide\Raster\OTW\5m\



RESOLUTION 5_METERS

FILE FORMAT INFORMATION	
FORMAT NAME	TIFF
ORDER	BIP
DATA TYPE	8-BIT_UNSIGNED
ORIENTATION	UPPER_LEFT
PIXEL DIMENSIONS	11212 x 11212
CHANNELS	
# CHANNELS	3
COLOR CHANNEL	
COLOR SPACE	RGB
CHANNEL_2	R
CHANNEL_1	G
CHANNEL_0	B

ORTHO GEOGRAPHIC REFERENCE		
UPPERLEFT		
LONGITUDE	-116.001796630568	DEGREES_LATLON
LATITUDE	37.0017966305682	DEGREES_LATLON
UPPERRIGHT		
LONGITUDE	-115.498245998055	DEGREES_LATLON
LATITUDE	37.0017966305682	DEGREES_LATLON
LOWERRIGHT		
LONGITUDE	-115.498245998055	DEGREES_LATLON
LATITUDE	36.4982459980548	DEGREES_LATLON
LOWERLEFT		
LONGITUDE	-116.001796630568	DEGREES_LATLON
LATITUDE	36.4982459980548	DEGREES_LATLON
X PIXEL		
Y PIXEL		
UTM ZONE		
DEGREE PER PIXEL	4.4915764E-005	DEGREES_LATLON

Figure 4 NPSI metadata example: 5m Out-the-Window raster data.

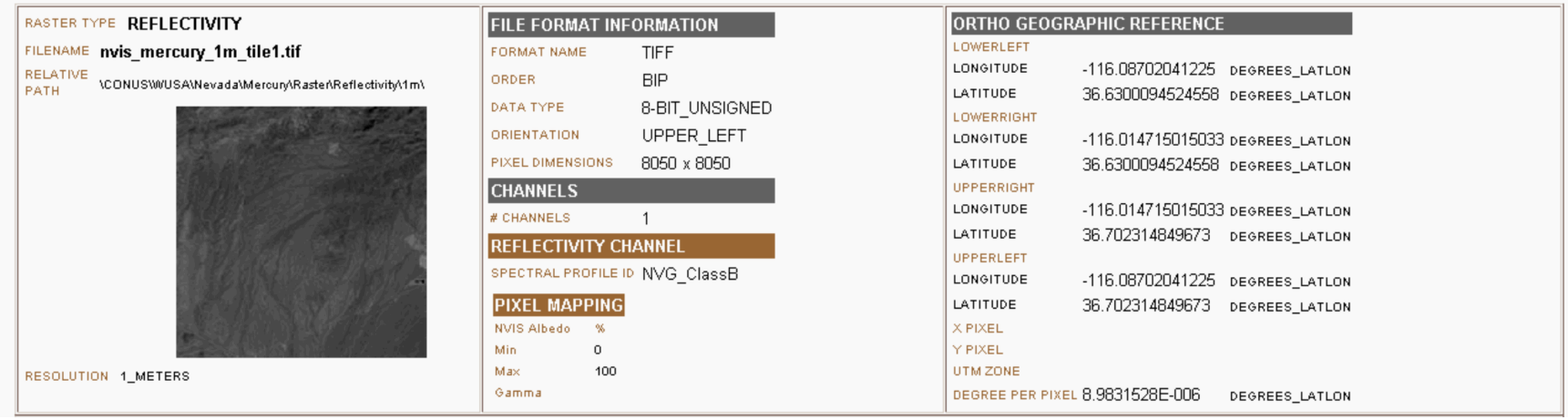


Figure 5 NPSI metadata example: 1m Reflectivity (1 band) raster data.

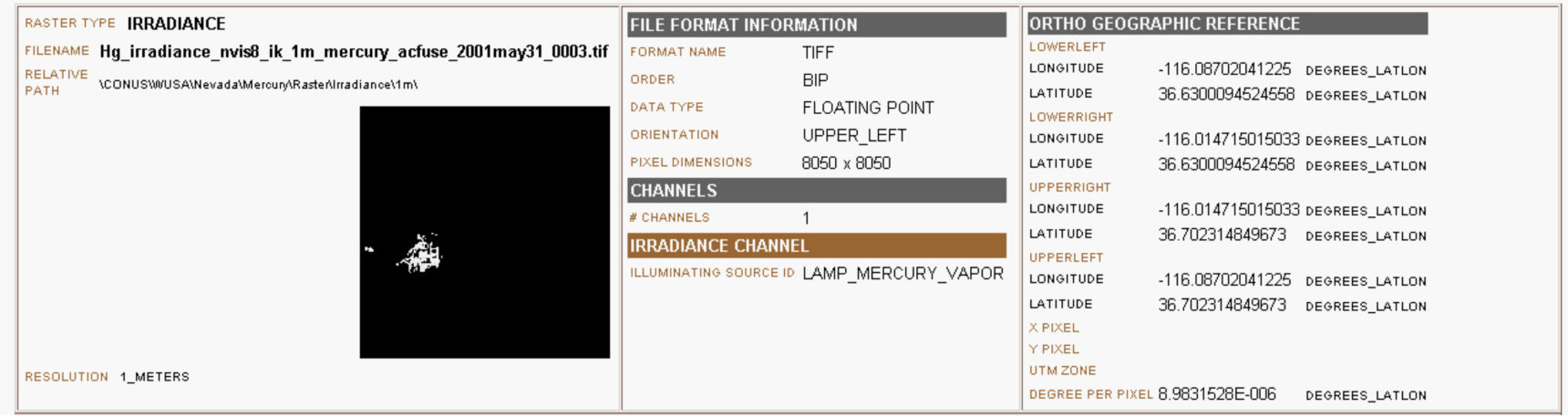


Figure 6 NPSI metadata example: 1m Mercury vapor lamp Irradiance (1 band) raster data.

Figure 7 NPSI metadata example: Cultural lights vector points data.

4. Organization of the Standard

The metadata standard is defined in a schema file based on World Wide Web Consortium (W3C) XML format (http://www.w3.org/2001/XMLSchema) and is available separately from this document in XML Schema Definition (XSD) file format. The filename naming convention of the schema is below:

NPSI.X.YY.xsd, where X = Major revision and YY = minor file revision.

The schema hard copy is reported in the following sections:

- NPSI Base
- NPSI Identification Information
- NPSI Distribution Information
- NPSI Dataset
- Complex Types

4.1 NPSI Base

NPSI Base is the root element of the XML document. Its children are the complete content of the metadata for a given dataset.

4.2 NPSI Identification Information

NPSI Identification Information contains the dataset identification elements, including licensing and classification of included data files.

4.3 NPSI Distribution Information

NPSI Distribution Information contains the contact information to obtain the distributable dataset.

4.4 NPSI Dataset

NPSI Dataset element is grouped into the following groups:

4.4.1 Raster Data

The raster data contains raster data files used in the runtime database generation process. The raster data may represent imagery, elevation, material classification, various masks, in-band sensor reflectivity rayer, etc. Each data file may contain n number of channels.

4.4.2 Vector Data

The vector data contains vector feature data files used in the runtime database generation process. The vector data may represent point, linear, and areal vector types.

4.4.3 Cultural Feature Data

Models and other cultural feature elements that are used at runtime or during the runtime database generation process.

4.4.4 NPSI Dictionary

The data dictionary serves as a repository for information about parameter definitions and valid values of the parameters included in the data set. This information is used to create the connection between the data dictionary and datasets and can be used to automate the data ingest and update process.

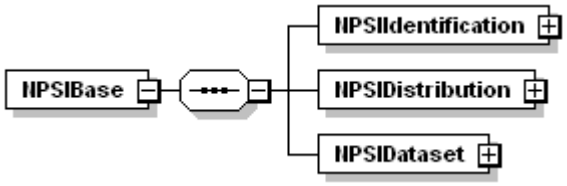
4.4.5 Complex Types

The complex types section contains a listing of all the complex types used by the above elements. A complex type is a typical element that may be used in multiple instances of elements. The list is alphabetical and not grouped into logical application. Each element that uses a complex type will have a hyperlink text to its complex type definition.

Appendix A NPSI Schema in a pictorial detailed description.

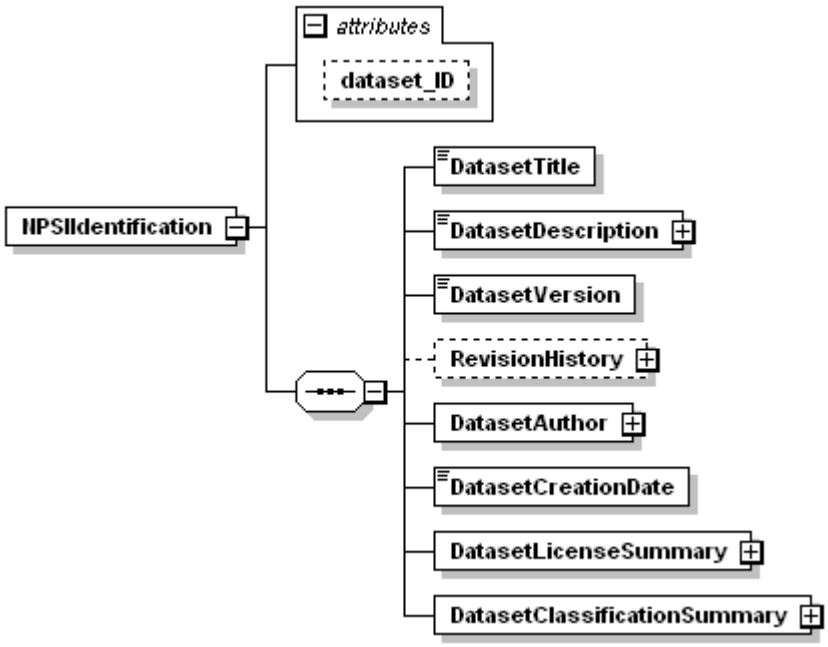
A.1 NPSI Base

element **NPSIBase**

diagram	
annotation	documentation "NPSIBase" is the root element of NPSI XML document.

A.2 NPSIIdentification

element **NPSIBase/NPSIIdentification**

diagram	
attributes	Name: dataset_ID; Type: **xsd:string**; Use: ; Default: ; Fixed: ; annotation: documentation: Unique dataset identifier implemented with GUID
annotation	documentation NPSIIdentification contains administrative information about the dataset including dataset title, descriptive summery of coverage and purpose, version history, author and license and classification information.

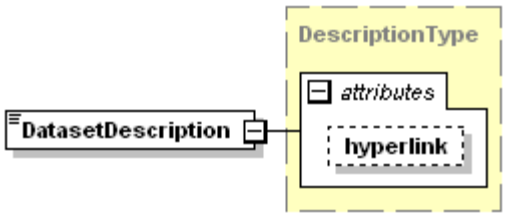
attribute **NPSIBase/NPSIIdentification/@dataset_ID**

type	**xsd:string**
annotation	documentation Unique dataset identifier implemented with GUID.

element **NPSIBase/NPSIIdentification/DatasetTitle**

diagram	
type	**xsd:string**
annotation	documentation The title by which the data set is known. The regional name of the dataset coverage is often used. For example: "Nellis AFB", "NAS Pensacola, Florida", "ECUSA".

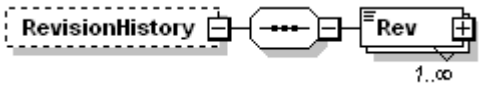
element **NPSIBase/NPSIIdentification/DatasetDescription**

diagram	
type	**DescriptionType**
attributes	Name: hyperlink; Type: **xsd:string**; Use; Default; Fixed; annotation
annotation	documentation Descriptions of the dataset. Descriptions include the dataset extent/coverage, included data type, best resolution, and purpose. A separate document may be attached and the URL location is indicated in "hyperlink" attribute.

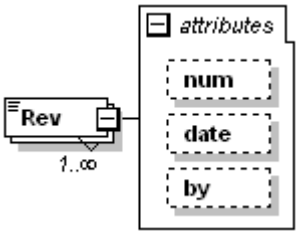
element **NPSIBase/NPSIIdentification/DatasetVersion**

diagram	
type	restriction of **xsd:string**
annotation	documentation Version of this dataset. A typical format would be: "r.M.m" where r=release number, M=major revision, m=minor revision. For example 1.2.5.

element **NPSIBase/NPSIIdentification/RevisionHistory**

diagram	
annotation	documentation A list of revision history to this dataset and metadata. The list contain the description of the revision with revision number, date, and the person or organization responsible for the revision. XML example: <RevisionHistory> <Rev num="1.0.0">Initial Release</Rev> </RevisionHistory>

element **NPSIBase/NPSIIdentification/RevisionHistory/Rev**

diagram	
type	extension of **xsd:string**
attributes	Name: num; Type: **xsd:string**; Use; Default; Fixed; annotation

	date	**xsd:date**
	by	**xsd:string**

attribute **NPSIBase/NPSIIdentification/RevisionHistory/Rev/@num**

type	**xsd:string**

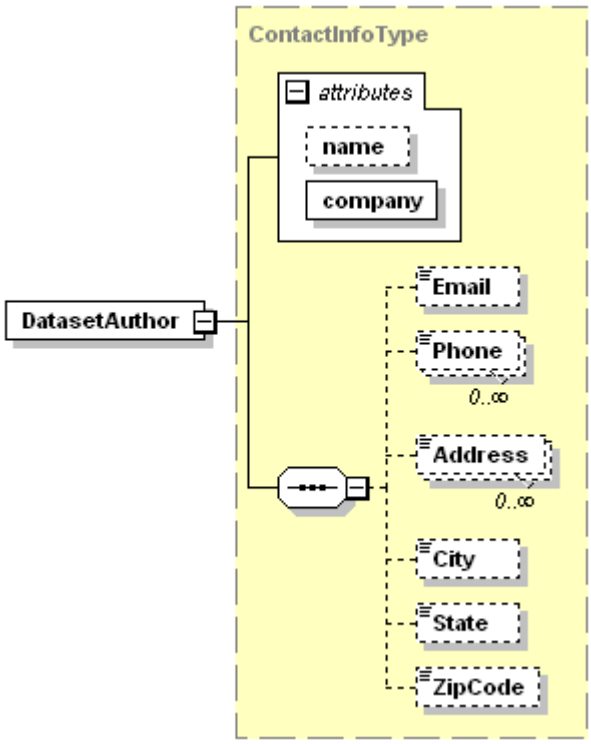
attribute **NPSIBase/NPSIIdentification/RevisionHistory/Rev/@date**

type	**xsd:date**

attribute **NPSIBase/NPSIIdentification/RevisionHistory/Rev/@by**

type	**xsd:string**

element **NPSIBase/NPSIIdentification/DatasetAuthor**

diagram	
type	**ContactInfoType**

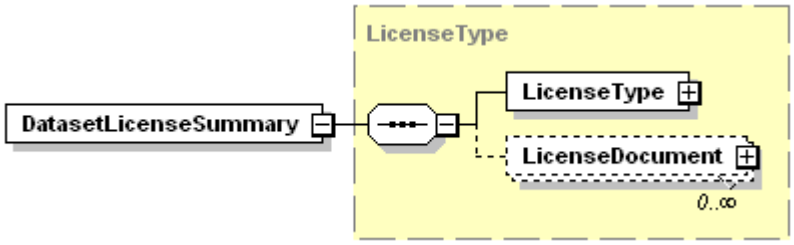
attributes	Name	Type	Use	Default	Fixed	annotation
	name	**xsd:string**				
	company	**xsd:string**	required			

annotation	documentation Contact information of the dataset original author.

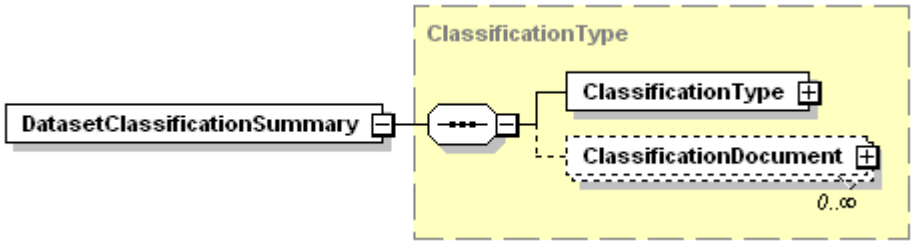
element **NPSIBase/NPSIIdentification/DatasetCreationDate**

diagram	
type	**xsd:date**
annotation	documentation The date this NPSI dataset is created and initially released.

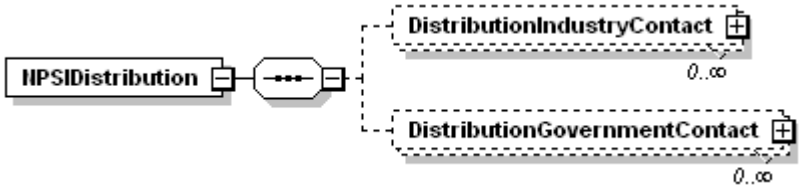
element **NPSIBase/NPSIIdentification/DatasetLicenseSummary**

diagram	
type	**LicenseType**
annotation	documentation Restrictions and legal prerequisites for accessing and using the overall dataset.

element **NPSIBase/NPSIIdentification/DatasetClassificationSummary**

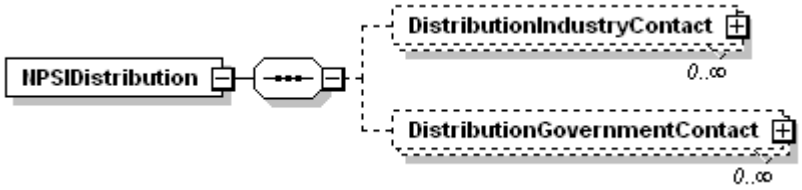
diagram	
type	**ClassificationType**
annotation	documentation Handling restrictions imposed on the overall dataset for national security, privacy, or other concerns.

element **NPSIBase/NPSIDistribution**

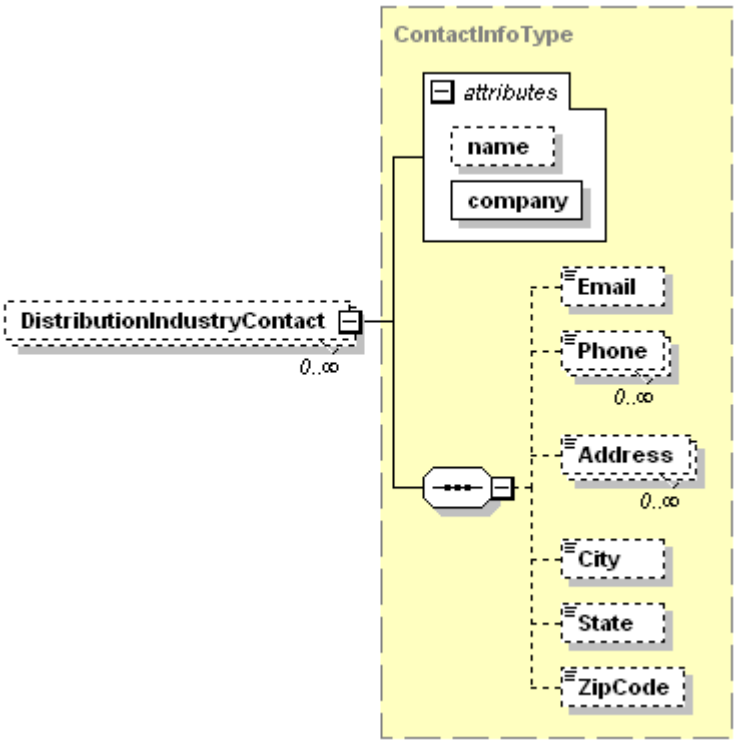
diagram	
annotation	documentation NPSIDistribution contains dataset distribution contact information. This element contains information on how to obtain the distributable dataset.

A.3 NPSIDistribution

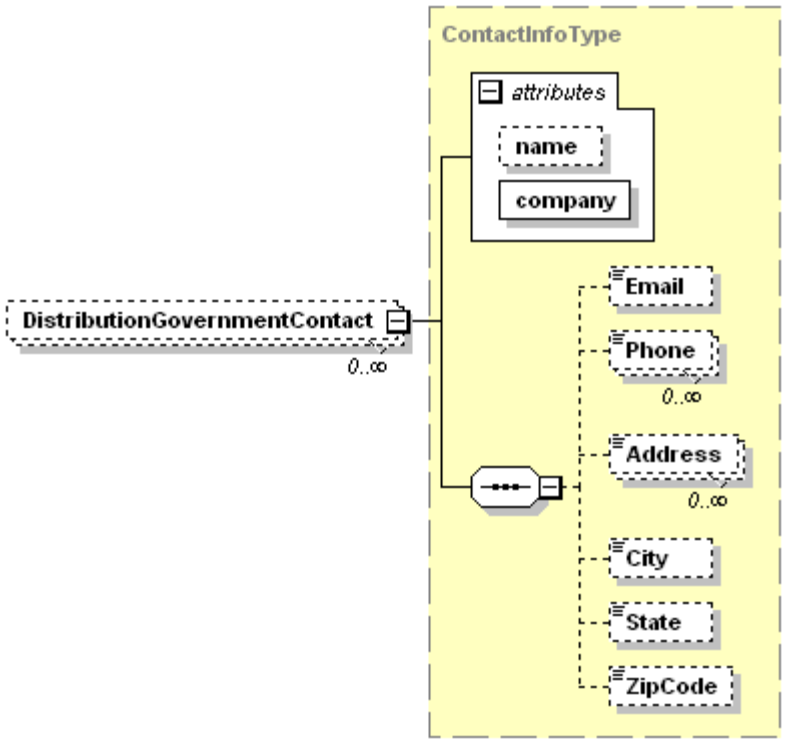
element **NPSIBase/NPSIDistribution**

diagram	
annotation	documentation NPSIDistribution contains dataset distribution contact information. This element contains information on how to obtain the distributable dataset.

element **NPSIBase/NPSIDistribution/DistributionIndustryContact**

diagram	
type	**ContactInfoType**
attributes	Name / Type / Use / Default / Fixed / annotation name — **xsd:string** company — **xsd:string** — required

element **NPSIBase/NPSIDistribution/DistributionGovernmentContact**

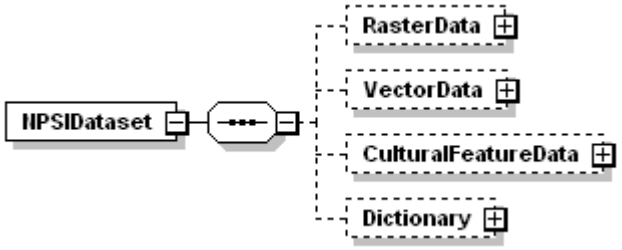
diagram	
type	**ContactInfoType**

attributes

Name	Type	Use	Default	Fixed	annotation
name	**xsd:string**				
company	**xsd:string**	required			

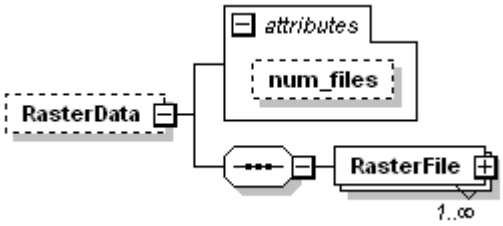
A.4 NPSIDataset

element **NPSIBase/NPSIDataset**

diagram	
annotation	documentation NPSIDataset is the data container of NPSI dataset. The data is organized in three data types -raster data, vector data, and cultural feature data or models. Dictionary element contains definitions of referenced "id"s.

A.4.1 RasterData

element **NPSIBase/NPSIDataset/RasterData**

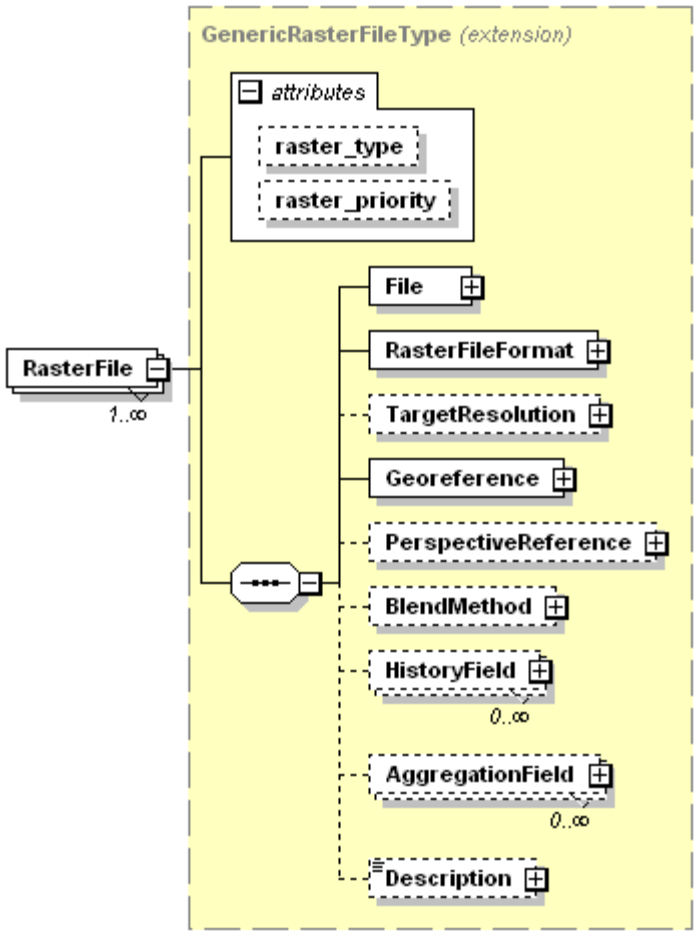
diagram	
attributes	Name: num_files; Type: ; Use: ; Default: ; Fixed: ; annotation: documentation: Total number of files define in "RasterData"
annotation	documentation Contains raster data files used in the runtime database generation process. The raster data may represent Out-the-Window, Elevation, Material Classification, various Masks, In-band Sensor Reflectivity Layer, etc. Each data file may contain "n" number of channels.

attribute **NPSIBase/NPSIDataset/RasterData/@num_files**

annotation	documentation Total number of files define in "RasterData".

element **NPSIBase/NPSIDataset/RasterData/RasterFile**

diagram



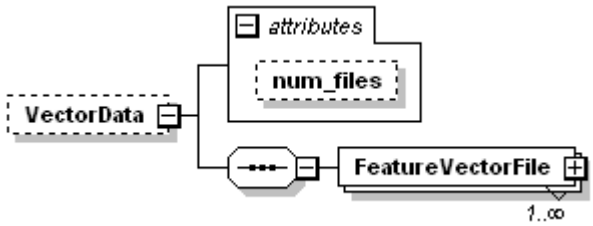
type: extension of **GenericRasterFileType**

attributes

Name	Type	Use	Default	Fixed	annotation
raster_type	**derived by: xsd:string**				documentation: Type of raster data application: ALPHA_MASK, OTW, TEXTURE, REFLECTIVITY, WATER_MASK. ELEVATION, COLOR, MULTISPECTRAL, HYPERSPECTRAL, REFLECTION, RADIANCE, MATERIAL_INDEX, and MATERIAL_PROPERTY.
raster_priority	**xsd:int**				documentation: An integer that defines the build order of the raster data files. This number should be unique for each raster file. The lowest number will be built first and is often considered background. The highest number will always be present.

A.4.2 VectorData

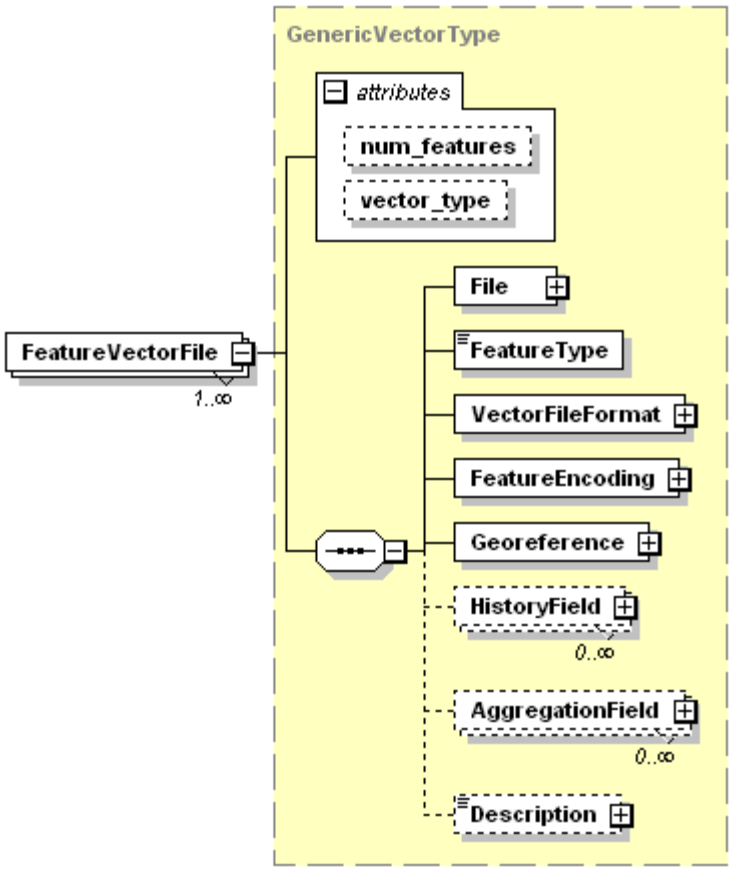
element **NPSIBase/NPSIDataset/VectorData**

diagram	
attributes	Name: num_files; Type: **xsd:integer**; Use: ; Default: ; Fixed: ; annotation: documentation: Total number of vector feature files.
annotation	documentation: Contains vector feature data files used in the runtime database generation process.

attribute **NPSIBase/NPSIDataset/VectorData/@num_files**

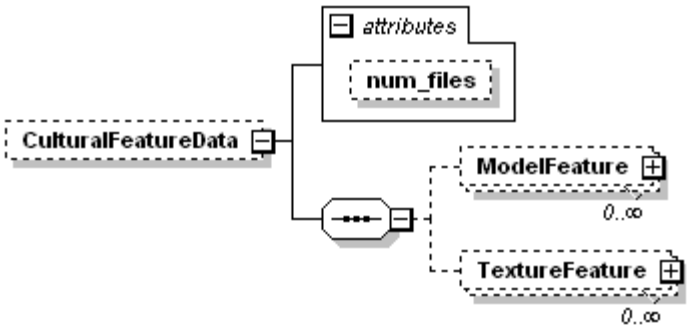
type	**xsd:integer**
annotation	documentation: Total number of vector feature files.

element **NPSIBase/NPSIDataset/VectorData/FeatureVectorFile**

diagram	
type	GenericVectorType
attributes	Name / Type / Use / Default / Fixed / annotation num_features — documentation: Total number of features within the vector feature file. vector_type — **derived by: xsd:string** — documentation: The type of vector: point, linear, or areal.
annotation	documentation Vector feature file(s).

A.4.3 CulturalFeatureData

element **NPSIBase/NPSIDataset/CulturalFeatureData**

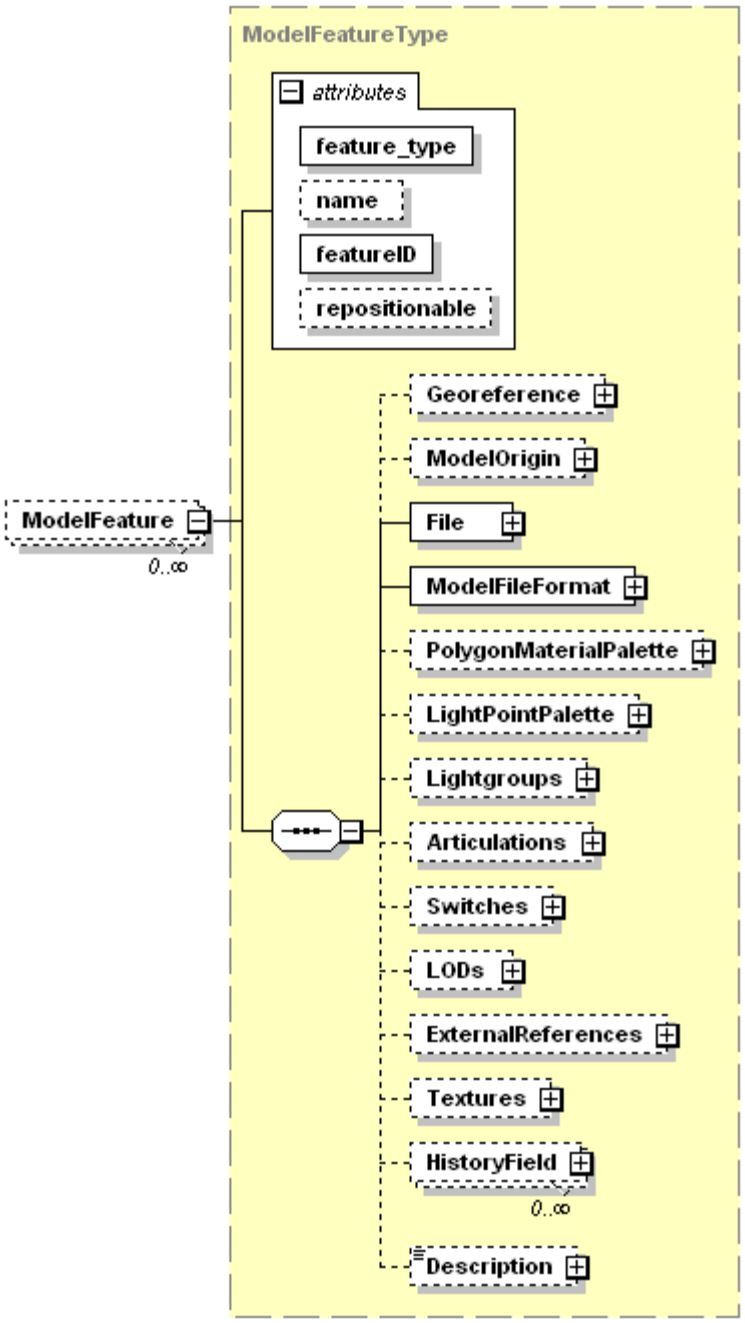
diagram	
attributes	Name: num_files; Type: **xsd:integer**; Use: ; Default: ; Fixed: ; annotation: documentation: Total number of cultural feature files.
annotation	documentation: Models and other cultural feature elements that are used at runtime or during the runtime database generation process.

attribute **NPSIBase/NPSIDataset/CulturalFeatureData/@num_files**

type	**xsd:integer**
annotation	documentation: Total number of cultural feature files.

element **NPSIBase/NPSIDataset/CulturalFeatureData/ModelFeature**

diagram



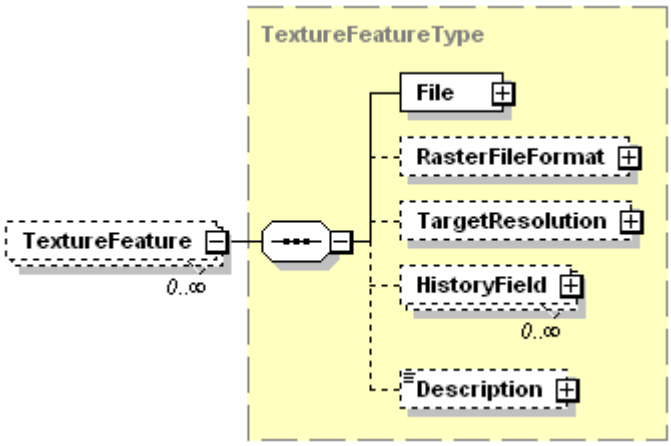
type **ModelFeatureType**

attributes

Name	Type	Use	Default	Fixed	annotation
feature_type	**derived by: xsd:string**	required			documentation Type of model feature air, ground, sea, etc.
name	**xsd:string**				documentation Short name of model.
featureID	**xsd:ID**	required			documentation Unique ID that identifies the

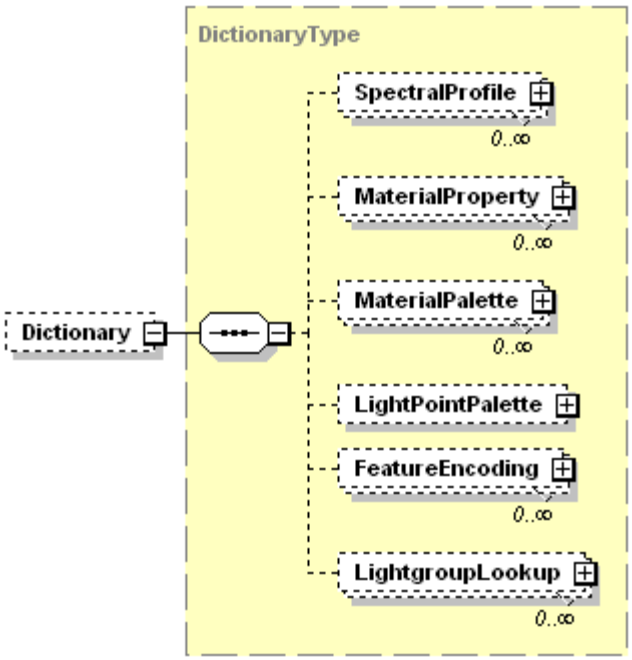
	repositionable **derived by: xsd:boolean**	cultural feature. documentation If the model is repositionable, then this element is TRUE, otherwise if static the element is FALSE. If the model is static, then Georeference element is mandatory.
annotation	documentation Static or moving/repositionable 3D model data.	

element **NPSIBase/NPSIDataset/CulturalFeatureData/TextureFeature**

diagram	
type	**TextureFeatureType**
annotation	documentation Texture file is a raster type file to be applied to the ModelFeature object.

A.4.4 Dictionary

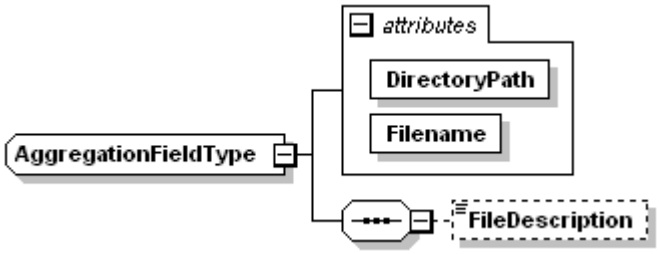
element **NPSIBase/NPSIDataset/Dictionary**

diagram	
type	**DictionaryType**
annotation	documentation The data dictionary serves as a repository for information about parameter definitions and valid values of the parameters included in the data set. This information is used to create the connection between the data dictionary and datasets and can be used to automate the data ingest and update process.

A.5 Complex Types

A.5.1 AggregationFieldType

complexType **AggregationFieldType**

diagram	
used by	elements **GenericRasterFileType/AggregationField GenericVectorType/AggregationField ModelFeatureType/ExternalReferences/ExternalReferenceFile**
attributes	Name / Type / Use / Default / Fixed / annotation DirectoryPath — **xsd:string** — required — documentation: Path to the file location. This path is relative to the location of this XML file. Filename — **xsd:string** — required — documentation: Filename with extension.
annotation	documentation Complex-type: fields within the vector feature file attribute table.

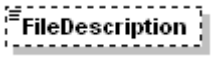
attribute **AggregationFieldType/@DirectoryPath**

type	**xsd:string**
annotation	documentation Path to the file location. This path is relative to the location of this XML file.

attribute **AggregationFieldType/@Filename**

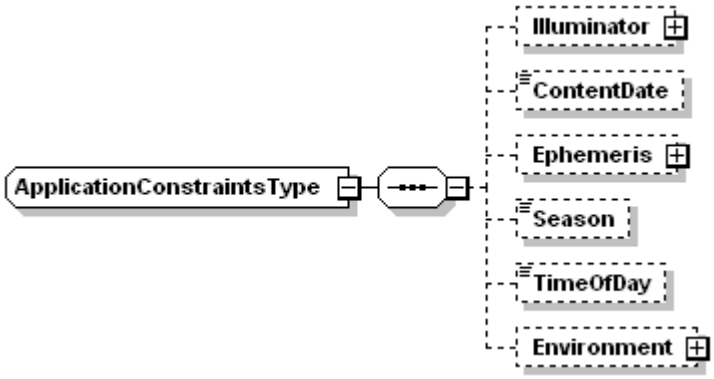
type	**xsd:string**
annotation	documentation Filename with extension.

element **AggregationFieldType/FileDescription**

diagram	
annotation	documentation Description of the association of the aggregate files.

A.5.2 ApplicationConstraintsType

complexType **ApplicationConstraintsType**

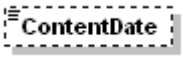
diagram	
used by	element **RasterChannelType/ApplicationConstraints**
annotation	documentation Complex-type: describes the simulated conditions under which the channel is most valid.

element **ApplicationConstraintsType/Illuminator**

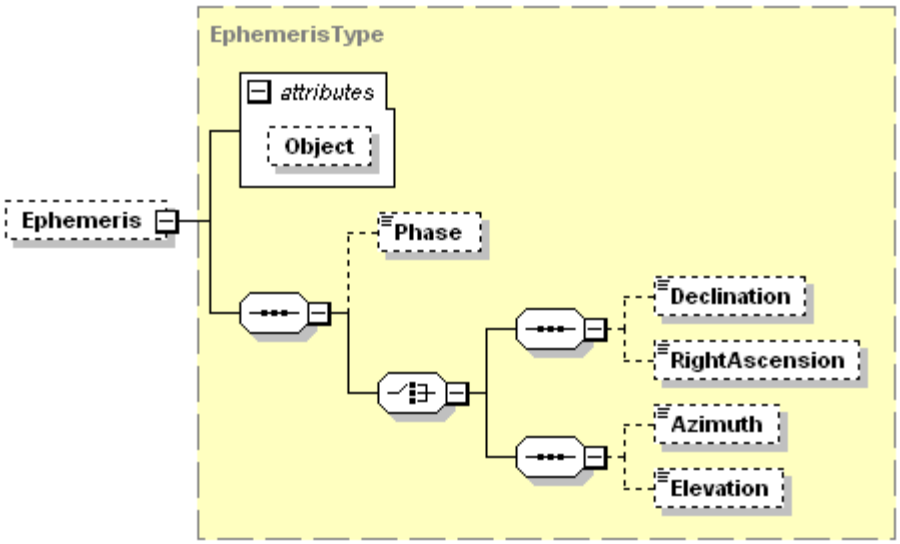
diagram						
attributes	Name	Type	Use	Default	Fixed	annotation
	SpectralProfileIDREF					

attribute **ApplicationConstraintsType/Illuminator/@SpectralProfileIDREF**

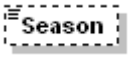
element **ApplicationConstraintsType/ContentDate**

diagram	
type	**xsd:date**

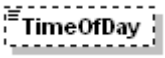
element **ApplicationConstraintsType/Ephemeris**

diagram	
type	**EphemerisType**
attributes	Name: Object; Type: **derived by: xsd:string**; Use: ; Default: ; Fixed: ; annotation:
annotation	documentation Apparent positions of heavenly objects.

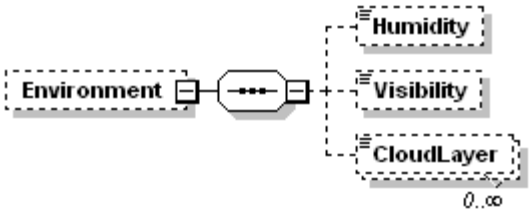
element **ApplicationConstraintsType/Season**

diagram	
type	restriction of **xsd:string**
facets	Kind: enumeration; Value: Summer; annotation: Kind: enumeration; Value: Fall Kind: enumeration; Value: Winter Kind: enumeration; Value: Spring

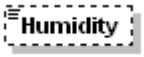
element **ApplicationConstraintsType/TimeOfDay**

diagram	
type	**xsd:time**

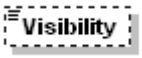
element **ApplicationConstraintsType/Environment**

diagram	
annotation	documentation (Future) Environmental conditions influencing the image.

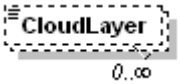
element **ApplicationConstraintsType/Environment/Humidity**

diagram	
type	restriction of **xsd:decimal**

element **ApplicationConstraintsType/Environment/Visibility**

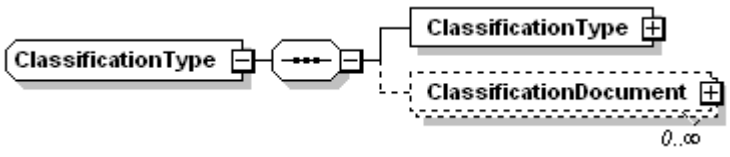
diagram	
type	restriction of **xsd:decimal**

element **ApplicationConstraintsType/Environment/CloudLayer**

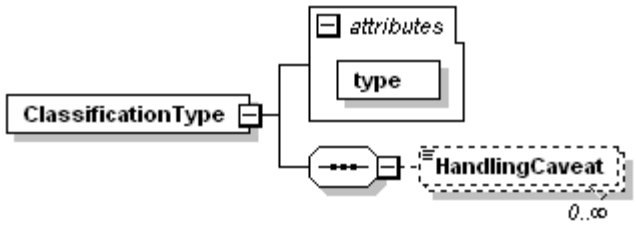
diagram	
type	**xsd:string**

A.5.3 ClassificationType

complexType **ClassificationType**

diagram	
used by	elements **FileRefType/Classification** **NPSIBase/NPSIIdentification/DatasetClassificationSummary**
annotation	documentation Complex-type: handling restrictions imposed on the overall dataset or each data file for national security, privacy, or other concerns.

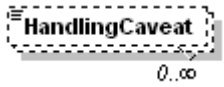
element **ClassificationType/ClassificationType**

diagram	
attributes	Name: type; Type: **derived by: xsd:string**; Use: required; Default: ; Fixed: ; annotation: documentation: Name of the handling restrictions.

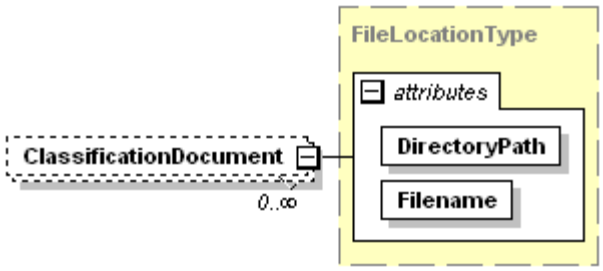
attribute **ClassificationType/ClassificationType/@type**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration UNCLASS enumeration SECRET enumeration TOPSECRET enumeration CONFIDENTIAL enumeration UNKNOWN
annotation	documentation Name of the handling restrictions.

element **ClassificationType/ClassificationType/HandlingCaveat**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration FOUO enumeration CNWDR enumeration LIMDIS enumeration ITAR enumeration EAR enumeration PROPIN enumeration NOFORN enumeration RESTRICTED
annotation	documentation Additional information about the handling restrictions.

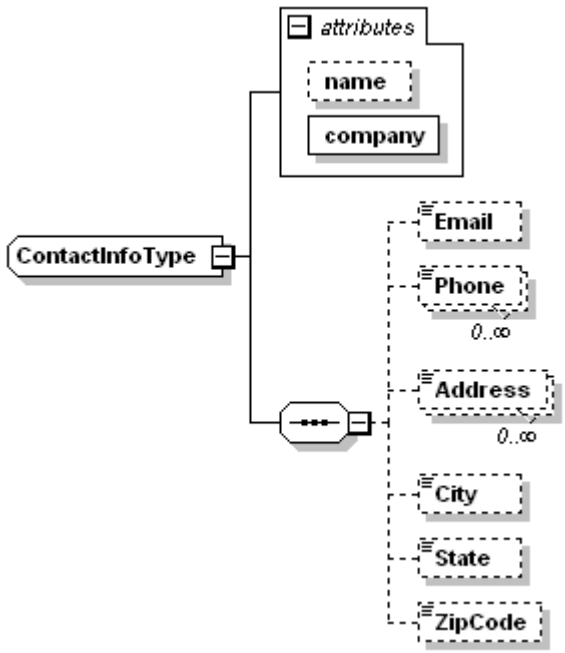
element **ClassificationType/ClassificationDocument**

diagram	
type	**FileLocationType**

attributes	Name	Type	Use	Default	Fixed	annotation
	DirectoryPath	**xsd:string**	required			documentation Path to the file location. This path is relative to the location of this XML file.
	Filename	**xsd:string**	required			documentation Filename with extension.

A.5.4 ContactInfoType

complexType **ContactInfoType**

diagram	
used by	elements **SourceType/Author** **NPSIBase/NPSIIdentification/DatasetAuthor** **NPSIBase/NPSIDistribution/DistributionGovernmentContact** **NPSIBase/NPSIDistribution/DistributionIndustryContact**

attributes	Name	Type	Use	Default	Fixed	annotation
	name	**xsd:string**				

	company **xsd:string** required
annotation	documentation Complex-type: identity of, and means to communicate with, person(s) and organization(s) associated with the data set.

attribute **ContactInfoType/@name**

type	**xsd:string**

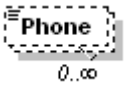
attribute **ContactInfoType/@company**

type	**xsd:string**

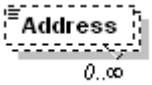
element **ContactInfoType/Email**

diagram	
type	**xsd:string**

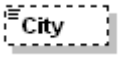
element **ContactInfoType/Phone**

diagram	
type	**xsd:string**

element **ContactInfoType/Address**

diagram	
type	**xsd:string**

element **ContactInfoType/City**

diagram	
type	**xsd:string**

element **ContactInfoType/State**

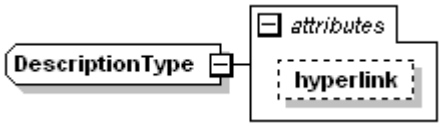
diagram	
type	**xsd:string**

element **ContactInfoType/ZipCode**

diagram	
type	restriction of **xsd:string**

A.5.5 DescriptionType

complexType **DescriptionType**

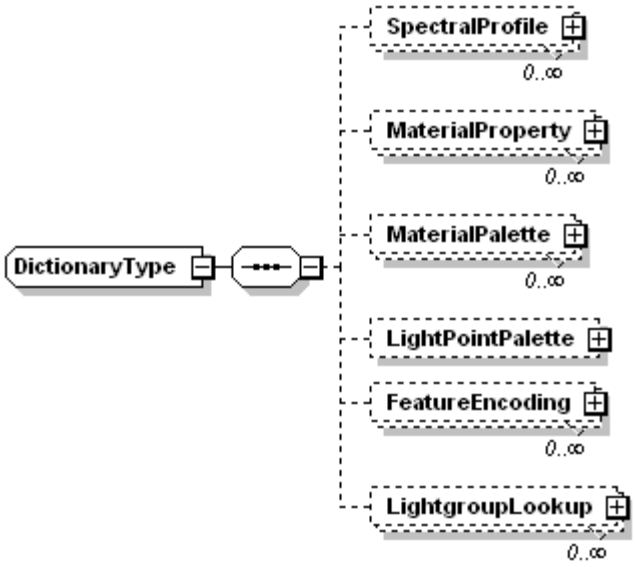
diagram	
type	extension of **xsd:string**
used by	elements **NPSIBase/NPSIIdentification/DatasetDescription GenericRasterFileType/Description GenericVectorType/Description ModelFeatureType/Description TextureFeatureType/Description DictionaryType/SpectralProfile/Description DictionaryType/MaterialProperty/Description**
attributes	Name: hyperlink; Type: **xsd:string**; Use; Default; Fixed; annotation
annotation	documentation Complex-type: description field for each dataset object (raster, vector, or model).

attribute **DescriptionType/@hyperlink**

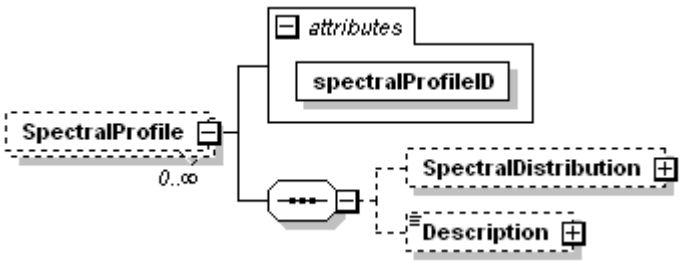
type	**xsd:string**

A.5.6 DictionaryType

complexType **DictionaryType**

diagram	
used by	element **NPSIBase/NPSIDataset/Dictionary**
annotation	documentation Complex-type: contains various references and definitions of "referenced-ID" being use in this metadata. Every item in the dictionary have a unique ID within the XML document defined in its attribute. The definition of the ID is in this dictionary, while the ID is being referenced by various other elements in the XML file.

element **DictionaryType/SpectralProfile**

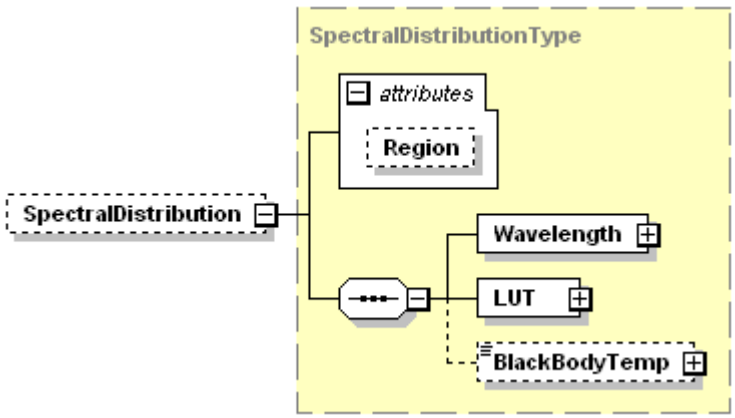
diagram	
attributes	Name: spectralProfileID; Type: **derived by: xsd:ID**; Use: required; Default: ; Fixed: ; annotation:
annotation	documentation SpectralProfile is a normalized/relative spectral definition of illuminating source or sensor response. The spectral distribution is represented by a Lookup Table or an external data file. The spectral distribution may also be represented by a black body temperature model.

attribute **DictionaryType/SpectralProfile/@spectralProfileID**

type	restriction of **xsd:ID**
facets	Kind / Value / annotation enumeration NVG_ClassA enumeration NVG_ClassB enumeration NVG_ClassB_LeakyGreen enumeration GENERIC_SWIR enumeration ATFLIR_BLK1_EO

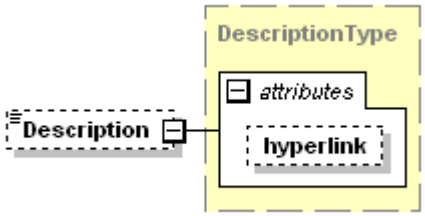
	enumeration	ATFLIR_BLK1_IR
	enumeration	GENERIC_LLTV
	enumeration	GENERIC_3_5_IR
	enumeration	GENERIC_9_12_IR
	enumeration	GENERIC_SAR
	enumeration	LAMP_MERCURY_VAPOR
	enumeration	LAMP_LOW_PRESS_SODIUM
	enumeration	LAMP_HIGH_PRESS_SODIUM
	enumeration	QB_RED
	enumeration	QB_GREEN
	enumeration	QB_BLUE
	enumeration	QB_NIR
	enumeration	QB_PAN
	enumeration	IK_RED
	enumeration	IK_GREEN
	enumeration	IK_BLUE
	enumeration	IK_NIR
	enumeration	IK_PAN
	enumeration	L7_B10
	enumeration	L7_B20
	enumeration	L7_B30
	enumeration	L7_B40
	enumeration	L7_B50
	enumeration	L7_B61
	enumeration	L7_B62
	enumeration	L7_B70
	enumeration	L7_B80
	enumeration	IRS_PAN

element **DictionaryType/SpectralProfile/SpectralDistribution**

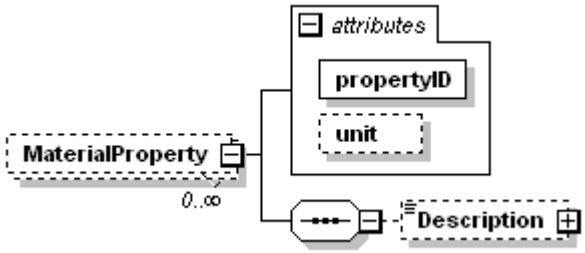
diagram	
type	SpectralDistributionType

attributes	Name	Type	Use	Default	Fixed	annotation
	Region	**derived by: xsd:string**				

element **DictionaryType/SpectralProfile/Description**

diagram	
type	**DescriptionType**
attributes	Name: hyperlink; Type: **xsd:string**; Use: ; Default: ; Fixed: ; annotation:

element **DictionaryType/MaterialProperty**

diagram	
attributes	Name: propertyID; Type: **xsd:ID**; Use: required; Default: ; Fixed: ; annotation: Name: unit; Type: **xsd:string**; Use: ; Default: ; Fixed: ; annotation:

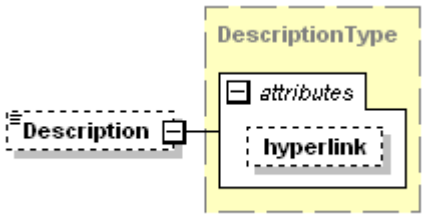
attribute **DictionaryType/MaterialProperty/@propertyID**

type	**xsd:ID**

attribute **DictionaryType/MaterialProperty/@unit**

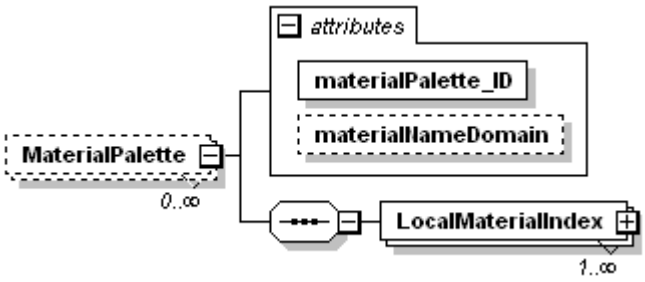
type	**xsd:string**

element **DictionaryType/MaterialProperty/Description**

diagram	
type	**DescriptionType**

attributes	Name	Type	Use	Default	Fixed	annotation
	hyperlink	**xsd:string**				

element **DictionaryType/MaterialPalette**

diagram	

attributes	Name	Type	Use	Default	Fixed	annotation
	materialPalette_ID	**xsd:ID**	required			documentation Contains the ID of the material map table to be defined.
	materialNameDomain					documentation If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER. etc.

annotation	
	documentation This table maps this dataset digital index values in the material class image (material ID) to globally defined MPRD_ID.

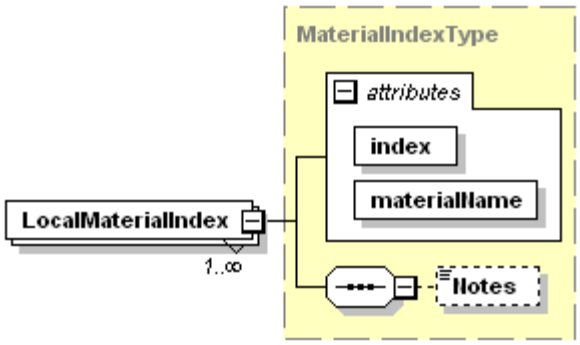
attribute **DictionaryType/MaterialPalette/@materialPalette_ID**

type	**xsd:ID**
annotation	documentation Contains the ID of the material map table to be defined.

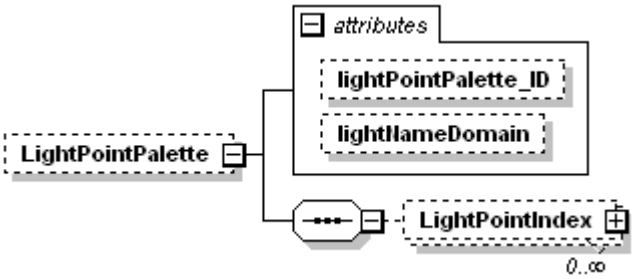
attribute **DictionaryType/MaterialPalette/@materialNameDomain**

annotation	documentation If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER. etc.

element **DictionaryType/MaterialPalette/LocalMaterialIndex**

diagram	
type	**MaterialIndexType**
attributes	Name: index — Type: **xsd:integer** — Use: required — Default: — Fixed: — annotation: documentation: Integer number that is encoded in the data. For example, is using raster pixel, this could be a value between 0 to 255. Name: materialName — Use: required — annotation: documentation: Spell the material name or ID exactly as defined under the material library or domain.
annotation	documentation Maps an integer index to a material name defined by the material library or domain.

element **DictionaryType/LightPointPalette**

diagram	
attributes	Name: lightPointPalette_ID — Type: **xsd:ID** Name: lightNameDomain — annotation: documentation: If standard light name or ID is used, indicate the name domain here. For example: CDB, LPRD, etc.

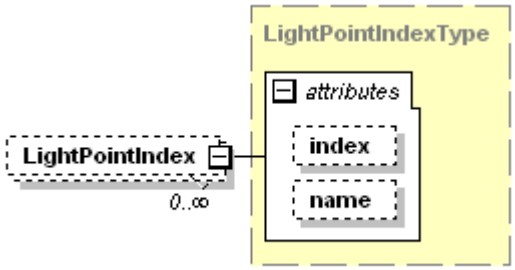
attribute **DictionaryType/LightPointPalette/@lightPointPalette_ID**

type	**xsd:ID**

attribute **DictionaryType/LightPointPalette/@lightNameDomain**

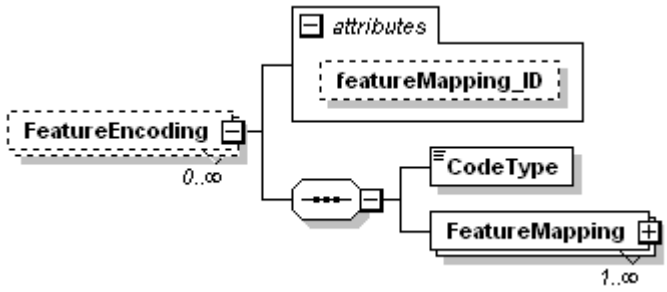
annotation	documentation If standard light name or ID is used, indicate the name domain here. For example: CDB, LPRD, etc.

element **DictionaryType/LightPointPalette/LightPointIndex**

diagram	
type	**LightPointIndexType**

attributes	Name	Type	Use	Default	Fixed	annotation
	index	**xsd:string**				documentation Integer palette index of light point type.
	name	**xsd:string**				documentation Use standard light naming convention based on the light name domain.

element **DictionaryType/FeatureEncoding**

diagram	

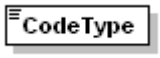
attributes	Name	Type	Use	Default	Fixed	annotation
	featureMapping_ID	**xsd:ID**				

annotation	documentation Vector feature code lookup table definition.

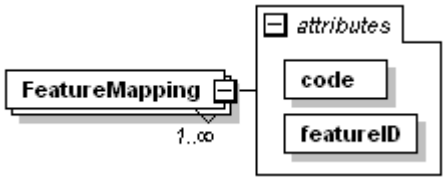
attribute **DictionaryType/FeatureEncoding/@featureMapping_ID**

type	**xsd:ID**

element **DictionaryType/FeatureEncoding/CodeType**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration DFAD enumeration FAC enumeration EDD enumeration VMAP enumeration CUSTOM
annotation	documentation Describes the domain of the feature types, i.e. standard DFAD feature codes, VMAP feature codes, or a custom lookup table.

element **DictionaryType/FeatureEncoding/FeatureMapping**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation code — **xsd:string** — required — documentation: The feature type from the vector feature file's CodeField. featureID — **xsd:string** — required — documentation: Unique ID of a cultural feature file identified in the CultureFeatureData section of the metadata.
annotation	documentation List of vector feature type mappings.

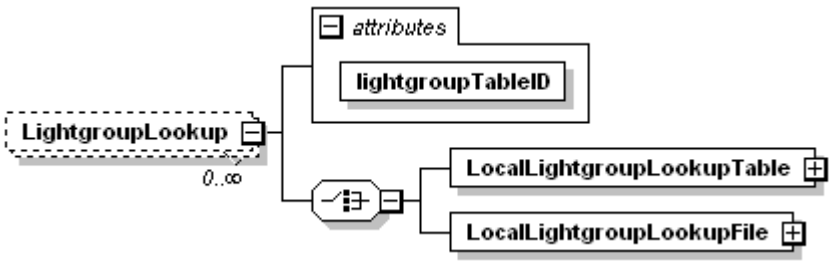
attribute **DictionaryType/FeatureEncoding/FeatureMapping/@code**

type	**xsd:string**
annotation	documentation The feature type from the vector feature file's CodeField.

attribute **DictionaryType/FeatureEncoding/FeatureMapping/@featureID**

type	**xsd:string**
annotation	documentation Unique ID of a cultural feature file identified in the CultureFeatureData section of the metadata.

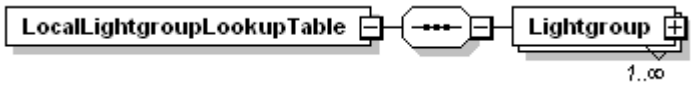
element **DictionaryType/LightgroupLookup**

diagram	
attributes	Name: lightgroupTableID; Type: **xsd:ID**; Use: required; Default: ; Fixed: ; annotation:
annotation	documentation Globally defined lightgroup lookup table.

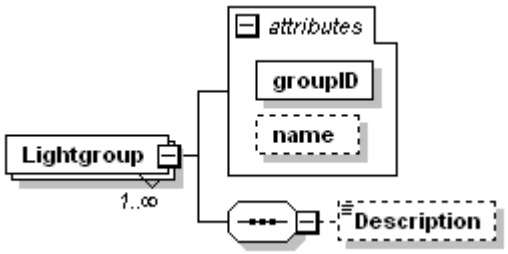
attribute **DictionaryType/LightgroupLookup/@lightgroupTableID**

type	**xsd:ID**

element **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable**

diagram	
annotation	documentation Locally defined table of lightgroups and descriptions within XML document.

element **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup**

diagram	
attributes	Name: groupID; Type: **xsd:integer**; Use: required; Default: ; Fixed: ; annotation: documentation: Numerical ID used to control light group. Name: name; Type: **xsd:string**; annotation: documentation: Name of light group, i.e. Landing Lights.
annotation	documentation Light control group.

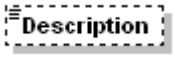
attribute **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup/@groupID**

type	**xsd:integer**
annotation	documentation Numerical ID used to control light group.

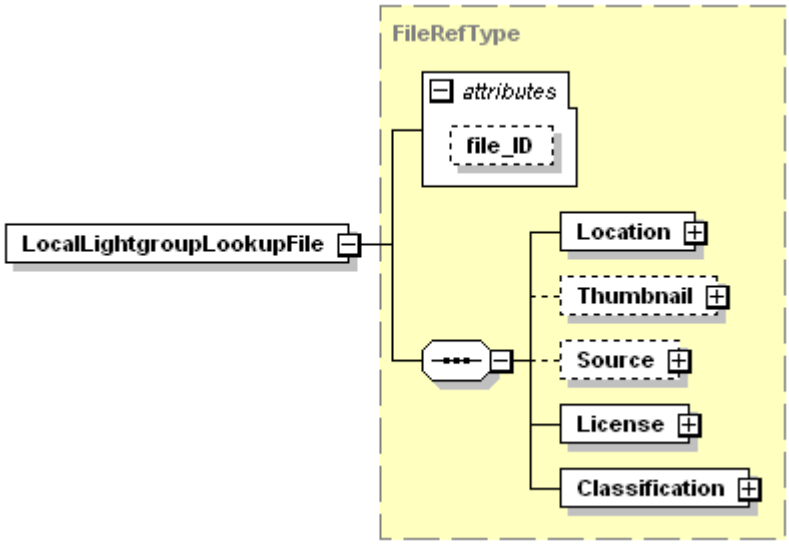
attribute **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup/@name**

type	**xsd:string**
annotation	documentation Name of light group, i.e. Landing Lights.

element **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup/Description**

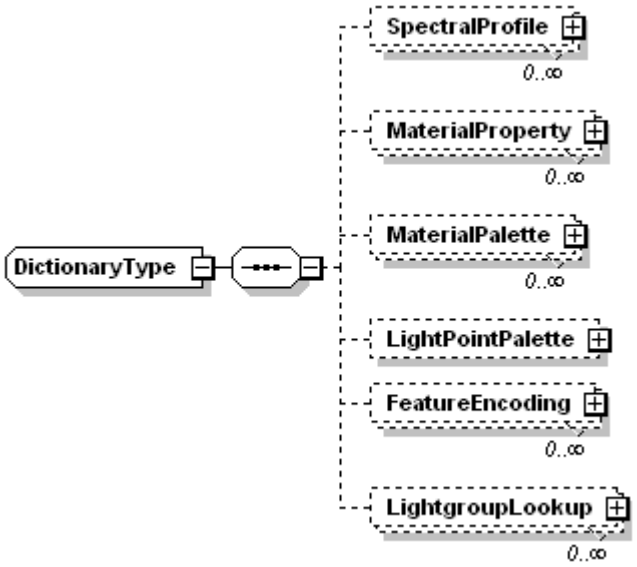
diagram	
type	**xsd:string**
annotation	documentation Description of the light group.

element **DictionaryType/LightgroupLookup/LocalLightgroupLookupFile**

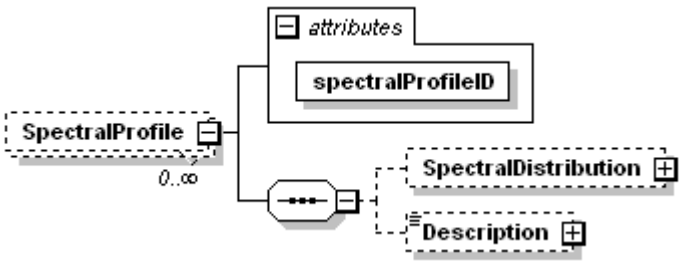
diagram	
type	**FileRefType**
attributes	Name: file_ID; Type: **xsd:ID**; Use: ; Default: ; Fixed: ; annotation: documentation: File ID is required only if this file is being referenced within this document.
annotation	documentation Locally referenced lookup file external to the XML document.

A.5.7 EphemerisType

complexType **DictionaryType**

diagram	
used by	element **NPSIBase/NPSIDataset/Dictionary**
annotation	documentation Complex-type: contains various references and definitions of "referenced-ID" being use in this metadata. Every item in the dictionary have a unique ID within the XML document defined in its attribute. The definition of the ID is in this dictionary, while the ID is being referenced by various other elements in the XML file.

element **DictionaryType/SpectralProfile**

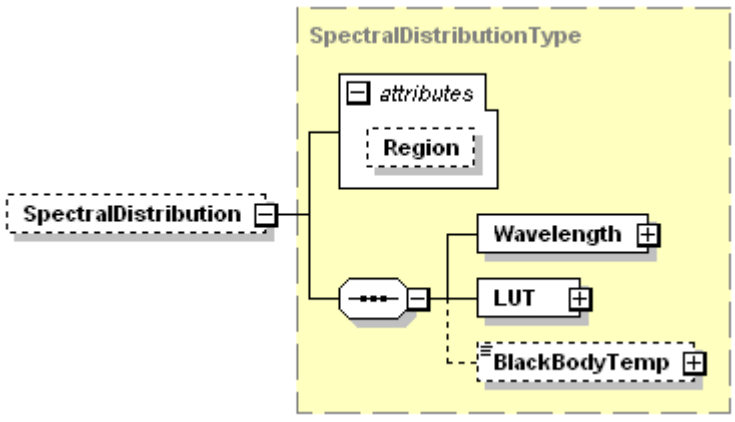
diagram	
attributes	Name: spectralProfileID; Type: **derived by: xsd:ID**; Use: required; Default: ; Fixed: ; annotation:
annotation	documentation SpectralProfile is a normalized/relative spectral definition of illuminating source or sensor response. The spectral distribution is represented by a Lookup Table or an external data file. The spectral distribution may also be represented by a black body temperature model.

attribute **DictionaryType/SpectralProfile/@spectralProfileID**

type	restriction of **xsd:ID**
facets	Kind: enumeration, Value: NVG_ClassA; Kind: enumeration, Value: NVG_ClassB; annotation:

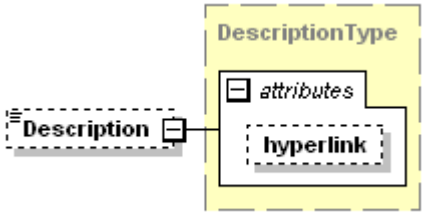
	enumeration	NVG_ClassB_LeakyGreen
	enumeration	GENERIC_SWIR
	enumeration	ATFLIR_BLK1_EO
	enumeration	ATFLIR_BLK1_IR
	enumeration	GENERIC_LLTV
	enumeration	GENERIC_3_5_IR
	enumeration	GENERIC_9_12_IR
	enumeration	GENERIC_SAR
	enumeration	LAMP_MERCURY_VAPOR
	enumeration	LAMP_LOW_PRESS_SODIUM
	enumeration	LAMP_HIGH_PRESS_SODIUM
	enumeration	QB_RED
	enumeration	QB_GREEN
	enumeration	QB_BLUE
	enumeration	QB_NIR
	enumeration	QB_PAN
	enumeration	IK_RED
	enumeration	IK_GREEN
	enumeration	IK_BLUE
	enumeration	IK_NIR
	enumeration	IK_PAN
	enumeration	L7_B10
	enumeration	L7_B20
	enumeration	L7_B30
	enumeration	L7_B40
	enumeration	L7_B50
	enumeration	L7_B61
	enumeration	L7_B62
	enumeration	L7_B70
	enumeration	L7_B80
	enumeration	IRS_PAN

element **DictionaryType/SpectralProfile/SpectralDistribution**

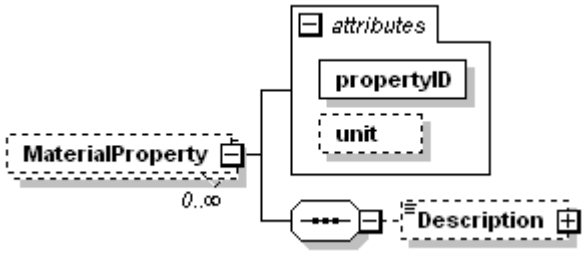
diagram	

type	**SpectralDistributionType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	Region	**derived by: xsd:string**				

element **DictionaryType/SpectralProfile/Description**

diagram						
type	**DescriptionType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	hyperlink	**xsd:string**				

element **DictionaryType/MaterialProperty**

diagram						
attributes	Name	Type	Use	Default	Fixed	annotation
	propertyID	**xsd:ID**	required			
	unit	**xsd:string**				

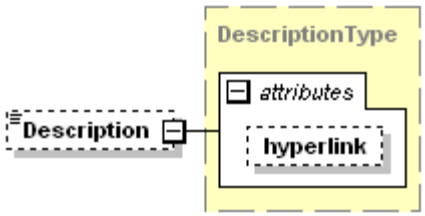
attribute **DictionaryType/MaterialProperty/@propertyID**

type	**xsd:ID**

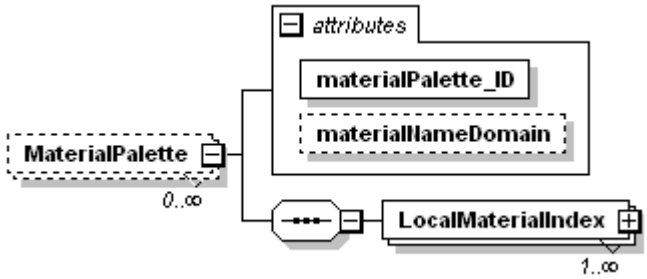
attribute **DictionaryType/MaterialProperty/@unit**

type	**xsd:string**

element **DictionaryType/MaterialProperty/Description**

diagram	
type	**DescriptionType**
attributes	Name: hyperlink; Type: **xsd:string**; Use: ; Default: ; Fixed: ; annotation:

element **DictionaryType/MaterialPalette**

diagram	
attributes	Name: materialPalette_ID; Type: **xsd:ID**; Use: required; Default: ; Fixed: ; annotation: documentation: Contains the ID of the material map table to be defined. Name: materialNameDomain; Type: ; Use: ; Default: ; Fixed: ; annotation: documentation: If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER. Etc.
annotation	documentation This table maps this dataset digital index values in the material class image (material ID) to globally defined MPRD_ID.

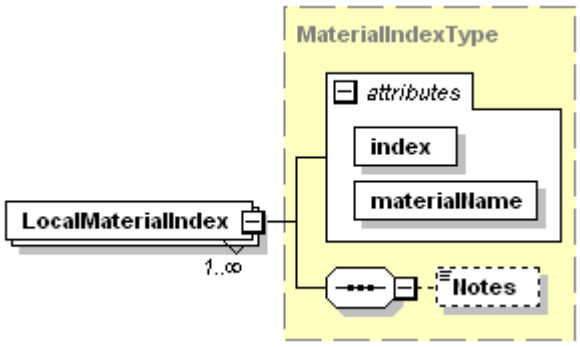
attribute **DictionaryType/MaterialPalette/@materialPalette_ID**

type	**xsd:ID**
annotation	documentation Contains the ID of the material map table to be defined.

attribute **DictionaryType/MaterialPalette/@materialNameDomain**

annotation	documentation If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER. etc.

element **DictionaryType/MaterialPalette/LocalMaterialIndex**

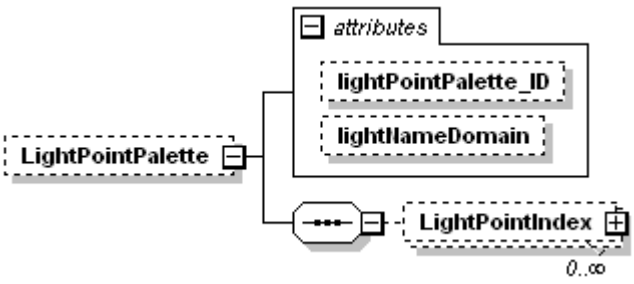
diagram	
type	**MaterialIndexType**

attributes

Name	Type	Use	Default	Fixed	annotation
index	**xsd:integer**	required			documentation Integer number that is encoded in the data. For example, is using raster pixel, this could be a value between 0 to 255.
materialName		required			documentation Spell the material name or ID exactly as defined under the material library or domain.

annotation	documentation Maps an integer index to a material name defined by the material library or domain.

element **DictionaryType/LightPointPalette**

diagram	

attributes

Name	Type	Use	Default	Fixed	annotation
lightPointPalette_ID	**xsd:ID**				
lightNameDomain					documentation If standard

		light name or ID is used, indicate the name domain here. For example: CDB, LPRD, etc.

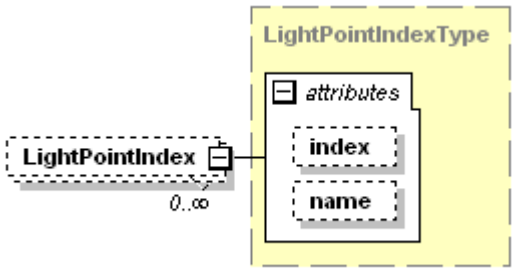
attribute **DictionaryType/LightPointPalette/@lightPointPalette_ID**

type	**xsd:ID**

attribute **DictionaryType/LightPointPalette/@lightNameDomain**

annotation	documentation If standard light name or ID is used, indicate the name domain here. For example: CDB, LPRD, etc.

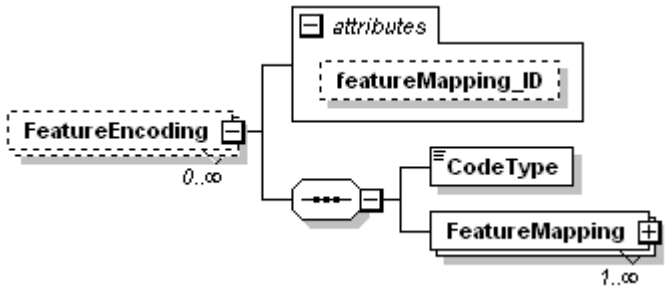
element **DictionaryType/LightPointPalette/LightPointIndex**

diagram	
type	**LightPointIndexType**

attributes

Name	Type	Use	Default	Fixed	annotation
index	**xsd:string**				documentation Integer palette index of light point type.
name	**xsd:string**				documentation Use standard light naming convention based on the light name domain.

element **DictionaryType/FeatureEncoding**

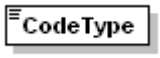
diagram	

attributes	Name	Type	Use	Default	Fixed	annotation
	featureMapping_ID	**xsd:ID**				
annotation	documentation Vector feature code lookup table definition.					

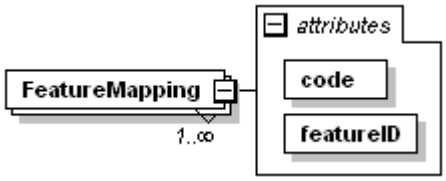
attribute **DictionaryType/FeatureEncoding/@featureMapping_ID**

type	**xsd:ID**

element **DictionaryType/FeatureEncoding/CodeType**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration DFAD enumeration FAC enumeration EDD enumeration VMAP enumeration CUSTOM
annotation	documentation Describes the domain of the feature types, i.e. standard DFAD feature codes, VMAP feature codes, or a custom lookup table.

element **DictionaryType/FeatureEncoding/FeatureMapping**

diagram						
attributes	Name	Type	Use	Default	Fixed	annotation
	code	**xsd:string**	required			documentation The feature type from the vector feature file's CodeField.
	featureID	**xsd:string**	required			documentation Unique ID of a cultural feature file identified in the CultureFeatureData section of the metadata.
annotation	documentation List of vector feature type mappings.					

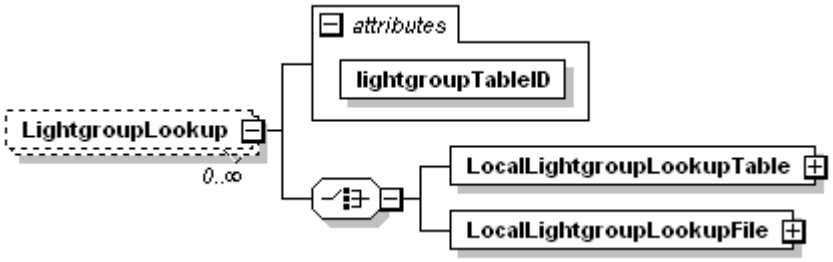
attribute **DictionaryType/FeatureEncoding/FeatureMapping/@code**

type	**xsd:string**
annotation	documentation The feature type from the vector feature file's CodeField.

attribute **DictionaryType/FeatureEncoding/FeatureMapping/@featureID**

type	**xsd:string**
annotation	documentation Unique ID of a cultural feature file identified in the CultureFeatureData section of the metadata.

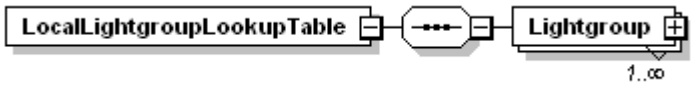
element **DictionaryType/LightgroupLookup**

diagram	
attributes	Name: lightgroupTableID; Type: **xsd:ID**; Use: required; Default: ; Fixed: ; annotation:
annotation	documentation Globally defined lightgroup lookup table.

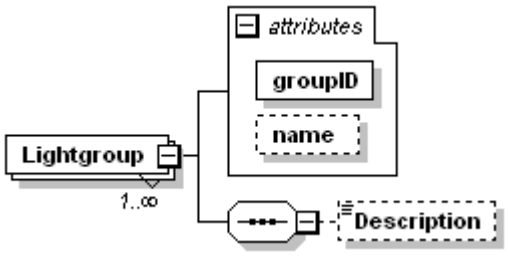
attribute **DictionaryType/LightgroupLookup/@lightgroupTableID**

type	**xsd:ID**

element **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable**

diagram	
annotation	documentation Locally defined table of lightgroups and descriptions within XML document.

element **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup**

diagram	
attributes	Name: groupID; Type: **xsd:integer**; Use: required; Default: ; Fixed: ; annotation: documentation — Numerical ID used to control light group. Name: name; Type: **xsd:string**; annotation: documentation — Name of light group, i.e. Landing

	Lights.
annotation	documentation Light control group.

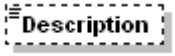
attribute **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup/@groupID**

type	**xsd:integer**
annotation	documentation Numerical ID used to control light group.

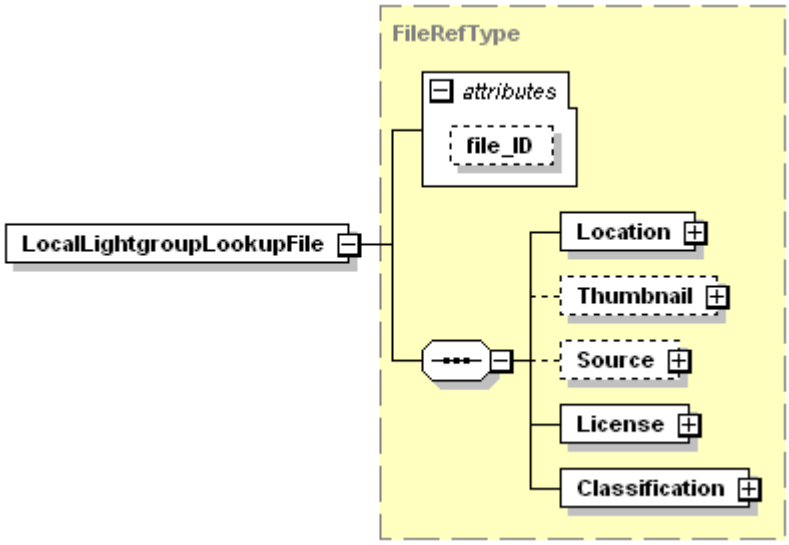
attribute **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup/@name**

type	**xsd:string**
annotation	documentation Name of light group, i.e. Landing Lights.

element **DictionaryType/LightgroupLookup/LocalLightgroupLookupTable/Lightgroup/Description**

diagram	
type	**xsd:string**
annotation	documentation Description of the light group.

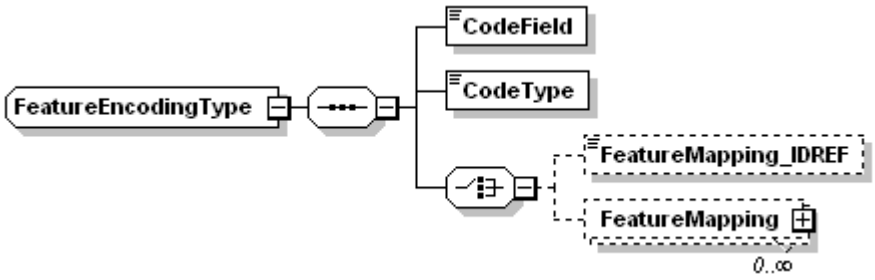
element **DictionaryType/LightgroupLookup/LocalLightgroupLookupFile**

diagram	
type	**FileRefType**
attributes	Name: file_ID; Type: **xsd:ID**; Use: ; Default: ; Fixed: ; annotation: documentation: File ID is required only if this file is being referenced within this document.

annotation	documentation Locally referenced lookup file external to the XML document.

A.5.8 FeatureEncodingType

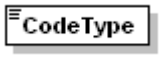
complexType **FeatureEncodingType**

diagram	
used by	element **GenericVectorType/FeatureEncoding**
annotation	documentation Complex-type: provides information for mapping cultural feature data types to vector features.

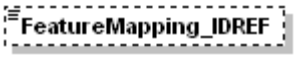
element **FeatureEncodingType/CodeField**

diagram	
type	**xsd:string**
annotation	documentation Name of the shapefield that contains feature ID.

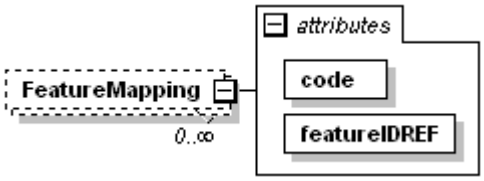
element **FeatureEncodingType/CodeType**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration FACC enumeration FIC enumeration EDCS enumeration NEC enumeration TIGER enumeration AUTO enumeration CUSTOM
annotation	documentation Describes the feature encoding standard for this shapefile, such as FACC, NEC or EDCS. If none of the standard code, use CUSTOM.

element **FeatureEncodingType/FeatureMapping_IDREF**

diagram	
type	**xsd:string**

element **FeatureEncodingType/FeatureMapping**

diagram	
attributes	Name: code — Type: **xsd:string** — Use: required — annotation: documentation: The feature type from the vector feature file's CodeField. Name: featureIDREF — Type: **xsd:string** — Use: required — annotation: documentation: Unique ID of a cultural feature file identified in the CultureFeatureData section of the metadata.
annotation	documentation List of vector feature type mappings to a specific feature model ID (OpenFlight).

attribute **FeatureEncodingType/FeatureMapping/@code**

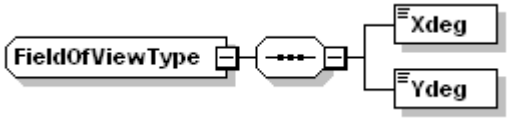
type	**xsd:string**
annotation	documentation The feature type from the vector feature file's CodeField.

attribute **FeatureEncodingType/FeatureMapping/@featureIDREF**

type	**xsd:string**
annotation	documentation Unique ID of a cultural feature file identified in the CultureFeatureData section of the metadata.

A.5.9 FieldOfViewType

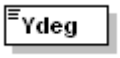
complexType **FieldOfViewType**

diagram	
annotation	documentation Complex-type: Field of View definition in X and Y degrees.

element **FieldOfViewType/Xdeg**

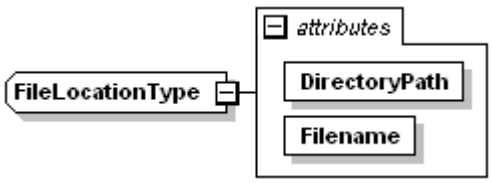
diagram	

element **FieldOfViewType/Ydeg**

diagram	

A.5.10 FileLocationType

complexType **FileLocationType**

diagram	
used by	elements **ClassificationType/ClassificationDocument** **PixelMappingType/LUT/File** **SpectralDistributionType/LUT/File** **LicenseType/LicenseDocument** **ModelFeatureType/Lightgroups/LocalLightgroupLookupFile** **FileRefType/Location** **FileRefType/Thumbnail**
attributes	Name: DirectoryPath — Type: **xsd:string** — Use: required — annotation: documentation: Path to the file location. This path is relative to the location of this XML file. Name: Filename — Type: **xsd:string** — Use: required — annotation: documentation: Filename with extension.
annotation	documentation Complex-type: file name and directory path information.

attribute **FileLocationType/@DirectoryPath**

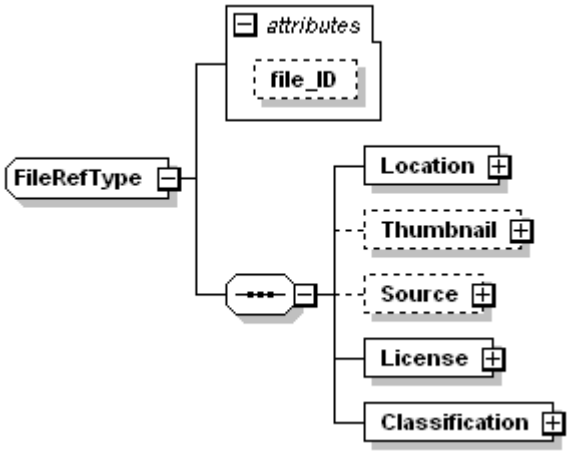
type	**xsd:string**
annotation	documentation Path to the file location. This path is relative to the location of this XML file.

attribute **FileLocationType/@Filename**

type	**xsd:string**
annotation	documentation Filename with extension.

A.5.11 FileRefType

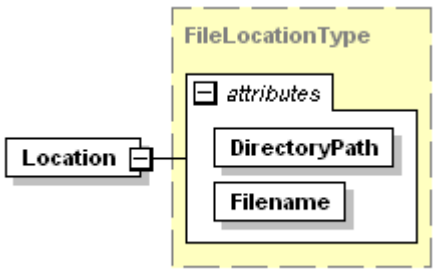
complexType **FileRefType**

diagram	
used by	elements GenericRasterFileType/BlendMethod/BlendMask/BlendMaskFile GenericRasterFileType/File GenericVectorType/File ModelFeatureType/File TextureFeatureType/File DictionaryType/LightgroupLookup/LocalLightgroupLookupFile
attributes	Name: file_ID; Type: xsd:ID; Use: ; Default: ; Fixed: ; annotation documentation: File ID is required only if this file is being referenced within this document.
annotation	documentation: Complex-type: template for referencing a file. File information includes file location, thumbnail, author, classification and licenses.

attribute **FileRefType/@file_ID**

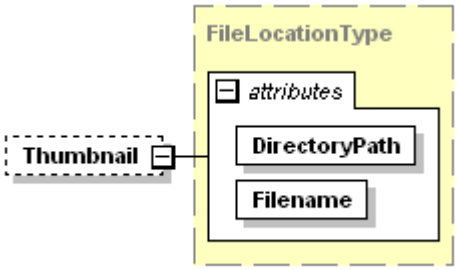
type	**xsd:ID**
annotation	documentation: File ID is required only if this file is being referenced within this document.

element **FileRefType/Location**

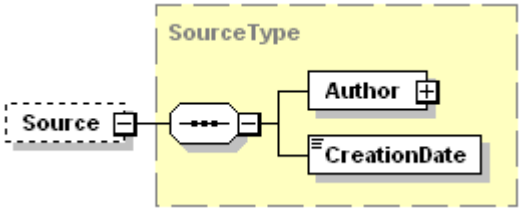
diagram	
type	FileLocationType

attributes	Name	Type	Use	Default	Fixed	annotation
	DirectoryPath	**xsd:string**	required			documentation Path to the file location. This path is relative to the location of this XML file.
	Filename	**xsd:string**	required			documentation Filename with extension.
annotation	documentation File directory path/location and filename.					

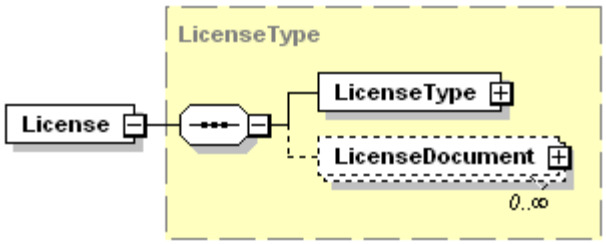
element **FileRefType/Thumbnail**

diagram						
type	**FileLocationType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	DirectoryPath	**xsd:string**	required			documentation Path to the file location. This path is relative to the location of this XML file.
	Filename	**xsd:string**	required			documentation Filename with extension.
annotation	documentation Optional thumbnail location and filename for file browsing.					

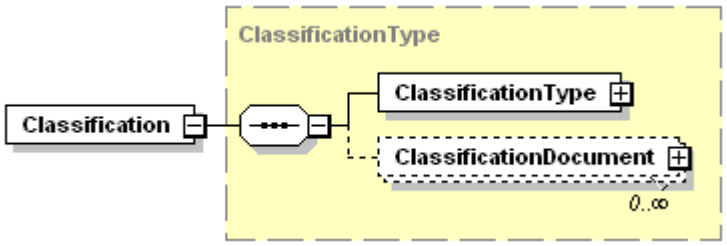
element **FileRefType/Source**

diagram	
type	**SourceType**
annotation	documentation Producer of this file and creation date.

element **FileRefType/License**

diagram	
type	**LicenseType**
annotation	documentation Restrictions and legal prerequisites for accessing and using this file if different than the overall dataset licensing.

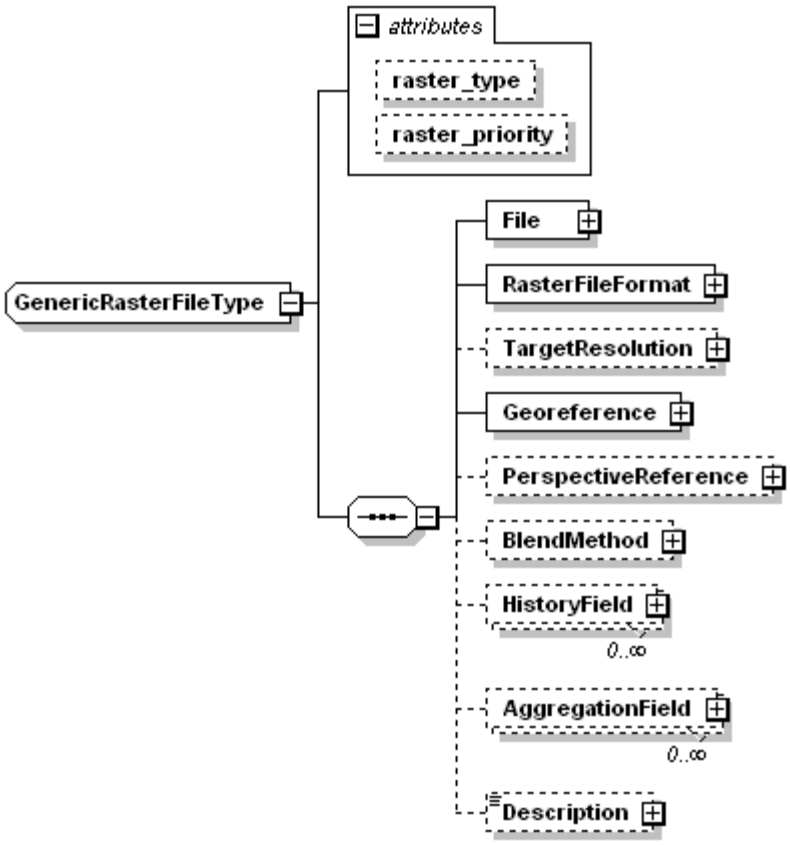
element **FileRefType/Classification**

diagram	
type	**ClassificationType**
annotation	documentation Handling restrictions imposed on this file for national security, privacy, or other concerns.

A.5.12 GenericRasterFileType

complexType **GenericRasterFileType**

diagram



used by

element **NPSIBase/NPSIDataset/RasterData/RasterFile**

attributes

Name	Type	Use	Default	Fixed	annotation
raster_type	**derived by: xsd:string**				documentation Type of raster data application: ALPHA_MASK, OTW, TEXTURE, REFLECTIVITY, WATER_MASK. ELEVATION, COLOR, MULTISPECTRAL, HYPERSPECTRAL, REFLECTION, RADIANCE, MATERIAL_INDEX, and MATERIAL_PROPERTY.
raster_priority	**xsd:int**				documentation An integer that defines the build order of the raster data files. This number should be unique for each raster file. The lowest number will be built first and is often considered background. The highest number will always be present.

annotation

documentation
Complex-type: template for raster type file. This type can be used for Raster data such as Elevation, OTW, masks, textures, etc.

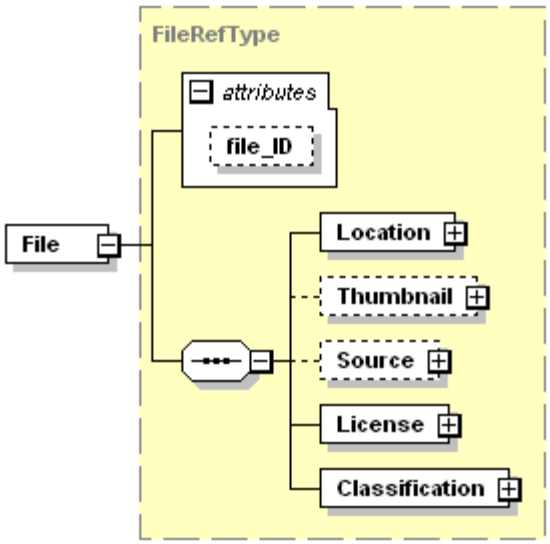
attribute **GenericRasterFileType/@raster_type**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration OTW enumeration WATER_MASK enumeration ALPHA_MASK enumeration ELEVATION enumeration TEXTURE enumeration REFLECTIVITY enumeration RADIANCE enumeration IRRADIANCE enumeration MATERIAL_INDEX enumeration MATERIAL_PROPERTY enumeration HORIZON_MAP enumeration REFLECTION enumeration AERIAL_SOURCE enumeration LANDSAT7_SOURCE enumeration QUICKBIRD_SOURCE enumeration IRS_SOURCE enumeration IKONOS_SOURCE enumeration ORTHO enumeration HYPERSPECTRAL enumeration
annotation	documentation Type of raster data application: ALPHA_MASK, OTW, TEXTURE, REFLECTIVITY, WATER_MASK. ELEVATION, COLOR, MULTISPECTRAL, HYPERSPECTRAL, REFLECTION, RADIANCE, MATERIAL_INDEX, and MATERIAL_PROPERTY.

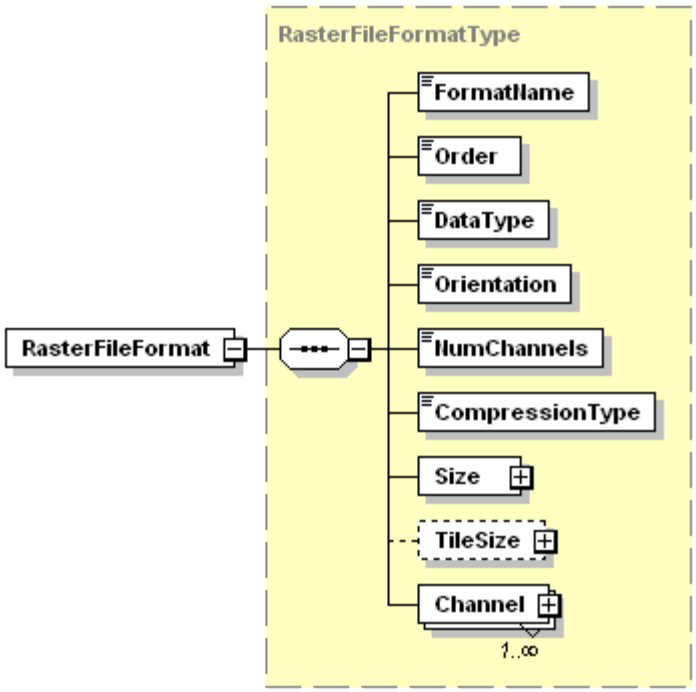
attribute **GenericRasterFileType/@raster_priority**

type	**xsd:int**
annotation	documentation An integer that defines the build order of the raster data files. This number should be unique for each raster file. The lowest number will be built first and is often considered background. The highest number will always be present.

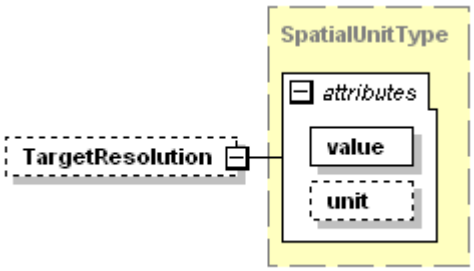
element **GenericRasterFileType/File**

diagram	
type	**FileRefType**
attributes	Name: file_ID Type: **xsd:ID** Use: Default: Fixed: annotation documentation: File ID is required only if this file is being referenced within this document.
annotation	documentation File identification information.

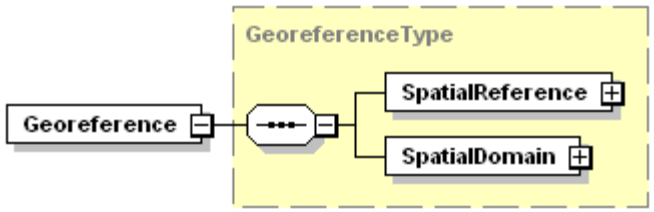
element **GenericRasterFileType/RasterFileFormat**

diagram	
type	**RasterFileFormatType**
annotation	documentation File spatial information.

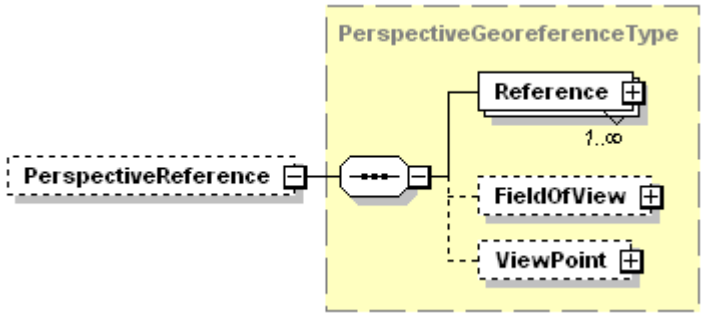
element **GenericRasterFileType/TargetResolution**

diagram	
type	**SpatialUnitType**
attributes	Name: value — Type: **xsd:double** — Use: required Name: unit — Type: **derived by: xsd:string**
annotation	documentation Intended resolution for runtime application.

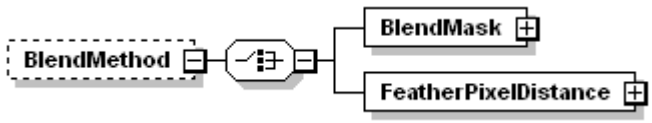
element **GenericRasterFileType/Georeference**

diagram	
type	GeoreferenceType

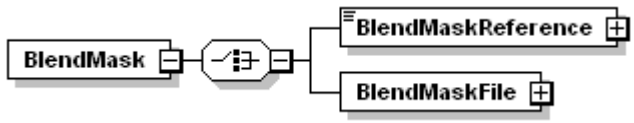
element **GenericRasterFileType/PerspectiveReference**

diagram	
type	PerspectiveGeoreferenceType
annotation	documentation Georeferencing structure for perspective images. The structure here allow for referencing multiple 3-D perspective reference points relative to the viewer origin/location.

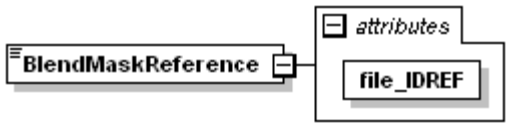
element **GenericRasterFileType/BlendMethod**

diagram	
annotation	documentation Use if this raster data requires blending using either a blend mask file or feather region.

element **GenericRasterFileType/BlendMethod/BlendMask**

diagram	
annotation	documentation Apply blend mask from the specified raster file. The file could be referenced in this document as Raster Alpha channel.

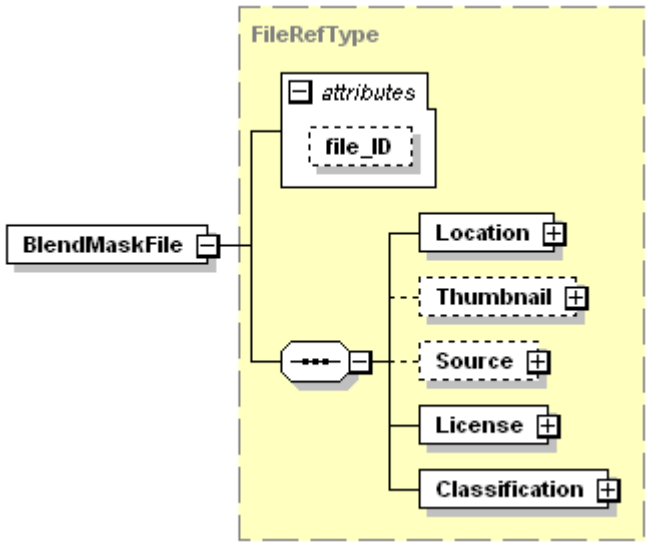
element **GenericRasterFileType/BlendMethod/BlendMask/BlendMaskReference**

diagram	
type	extension of **xsd:IDREF**
attributes	Name: file_IDREF; Type: **xsd:IDREF**; Use: required; Default: ; Fixed: ; annotation:

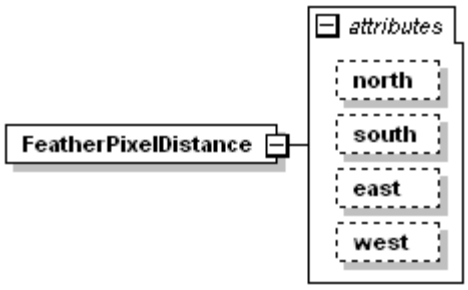
attribute **GenericRasterFileType/BlendMethod/BlendMask/BlendMaskReference/@file_IDREF**

type	**xsd:IDREF**

element **GenericRasterFileType/BlendMethod/BlendMask/BlendMaskFile**

diagram	
type	**FileRefType**
attributes	Name: file_ID; Type: **xsd:ID**; Use: ; Default: ; Fixed: ; annotation: documentation: File ID is required only if this file is being referenced within this document.

element **GenericRasterFileType/BlendMethod/FeatherPixelDistance**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation north **xsd:int** south **xsd:int** east **xsd:int** west **xsd:int**
annotation	documentation Apply transparency to this image using the pixel distances defined here. Transition from transparent to opaque over these distances.

attribute **GenericRasterFileType/BlendMethod/FeatherPixelDistance/@north**

type	**xsd:int**

attribute **GenericRasterFileType/BlendMethod/FeatherPixelDistance/@south**

type	**xsd:int**

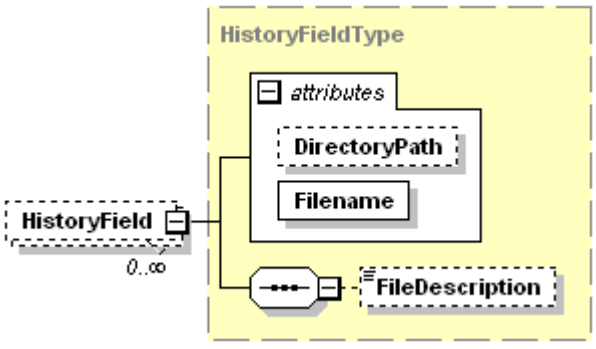
attribute **GenericRasterFileType/BlendMethod/FeatherPixelDistance/@east**

type	**xsd:int**

attribute **GenericRasterFileType/BlendMethod/FeatherPixelDistance/@west**

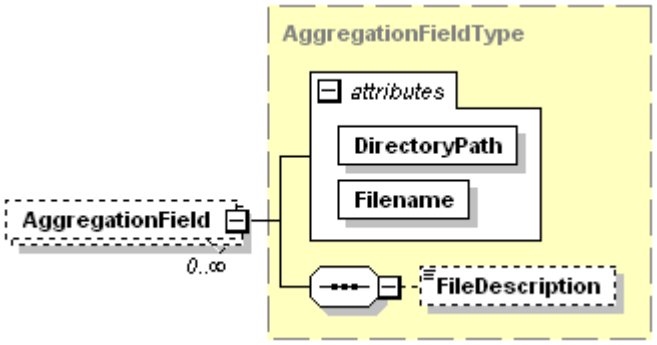
type	**xsd:int**

element **GenericRasterFileType/HistoryField**

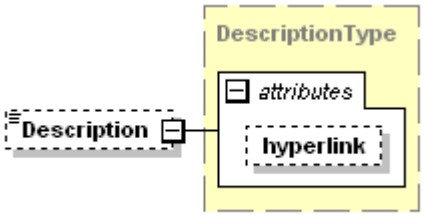
diagram	

type	**HistoryFieldType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	DirectoryPath	**xsd:string**	optional			documentation Path to the file location. This could be URL, relative, or absolute path.
	Filename	**xsd:string**	required			documentation Filename with extension.
annotation	documentation List of fields within the vector feature file attribute table.					

element **GenericRasterFileType/AggregationField**

diagram						
type	**AggregationFieldType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	DirectoryPath	**xsd:string**	required			documentation Path to the file location. This path is relative to the location of this XML file.
	Filename	**xsd:string**	required			documentation Filename with extension.
annotation	documentation List files associates with the Raster data file that are not listed as another RasterFile.					

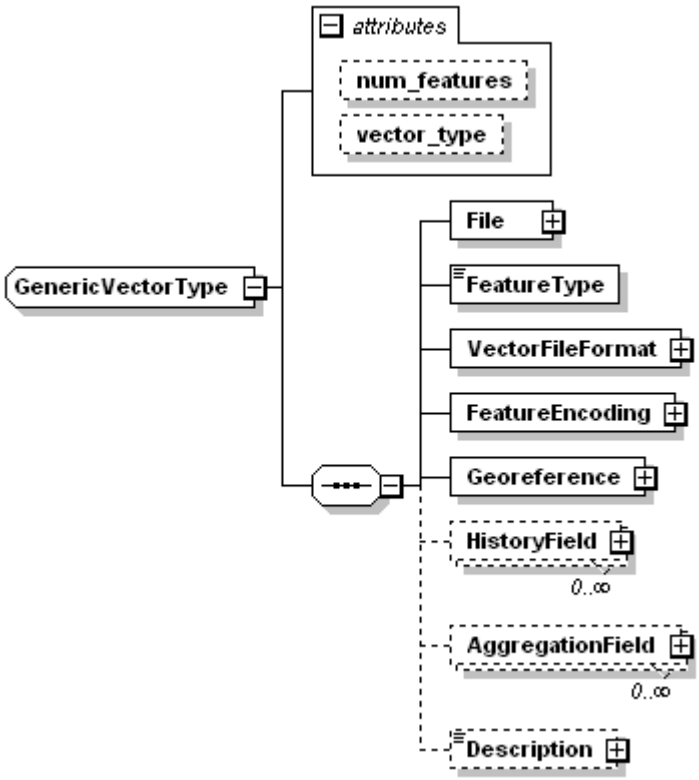
element **GenericRasterFileType/Description**

diagram						
type	**DescriptionType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	hyperlink	**xsd:string**				
annotation	documentation					

	Description of this raster data. The text for this description may be referenced in the hyperlink attribute.

A.5.13 GenericVectorType

complexType **GenericVectorType**

diagram	
used by	element **NPSIBase/NPSIDataset/VectorData/FeatureVectorFile**
attributes	Name: num_features — Type: — Use: — Default: — Fixed: — annotation: documentation: Total number of features within the vector feature file. Name: vector_type — Type: **derived by: xsd:string** — annotation: documentation: The type of vector: point, linear, or areal.
annotation	documentation Complex-type: template for feature vector file.

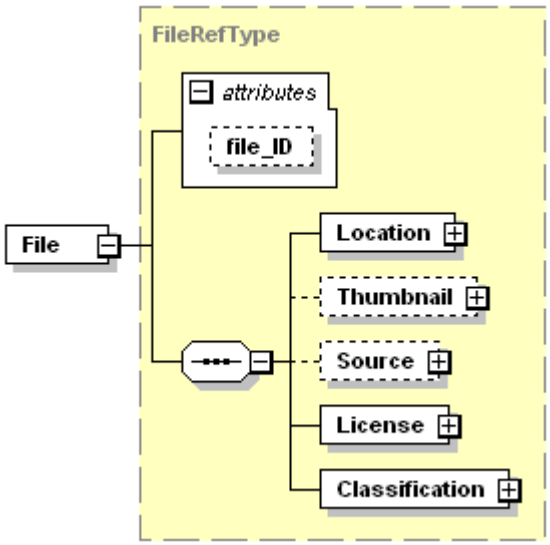
attribute **GenericVectorType/@num_features**

annotation	documentation Total number of features within the vector feature file.

attribute **GenericVectorType/@vector_type**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration POINT enumeration LINEAR enumeration AREAL
annotation	documentation The type of vector: point, linear, or areal.

element **GenericVectorType/File**

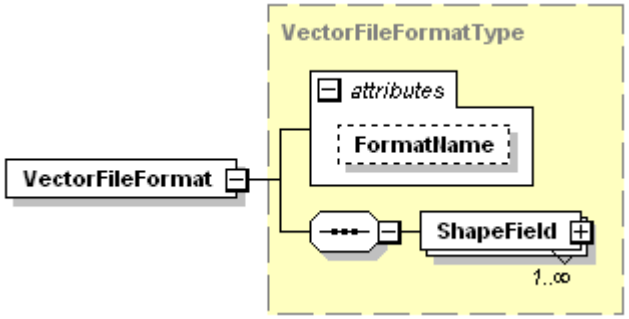
diagram	
type	FileRefType
attributes	Name / Type / Use / Default / Fixed / annotation file_ID **xsd:ID** documentation: File ID is required only if this file is being referenced within this document.
annotation	documentation Physical location of vector feature file.

element **GenericVectorType/FeatureType**

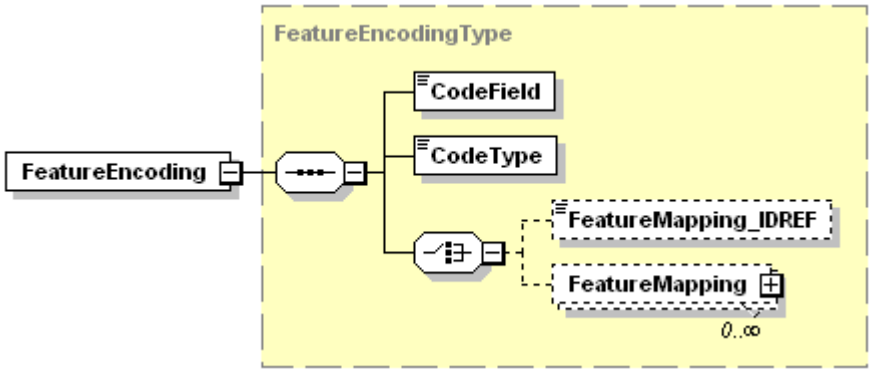
diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration CULTURAL_SCATTER enumeration GEOSPECIFIC enumeration COASTLINE enumeration POWERLINE enumeration RAILROAD

	enumeration ROAD enumeration WATER_BODY enumeration PIPELINE enumeration TEXTURE enumeration TREE_CANOPY enumeration CULTURAL_LIGHTS enumeration AIRFIELD enumeration BUILDING_FOOTPRINT enumeration GEOTYPICAL
annotation	documentation Describes the intended purpose of the vector feature file, i.e. cultural feature scatter, geospecific features, tree canopies, water bodies, etc.

element **GenericVectorType/VectorFileFormat**

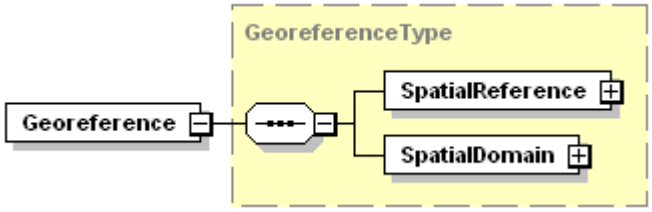
diagram	
type	**VectorFileFormatType**
attributes	Name: FormatName; Type: **derived by: xsd:string**; Use: ; Default: ; Fixed: ; annotation: documentation: Vector feature file type (currently restricted to ESRI shapefile).
annotation	documentation Contains vector feature file format.

element **GenericVectorType/FeatureEncoding**

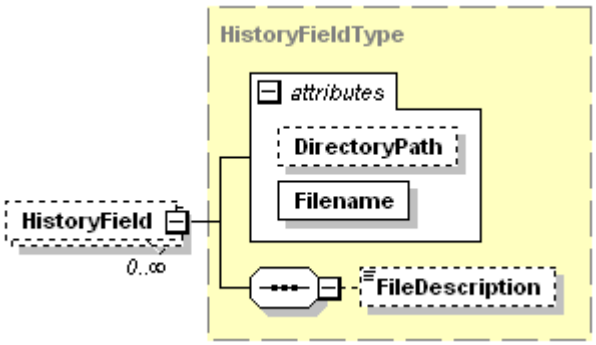
diagram	
type	**FeatureEncodingType**

annotation	documentation Provides information for mapping cultural feature data types to vector features.

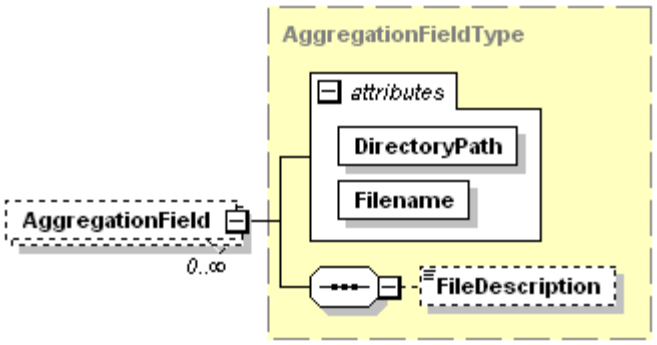
element **GenericVectorType/Georeference**

diagram	
type	**GeoreferenceType**
annotation	documentation Geographic reference information of the location and extent of the vector.

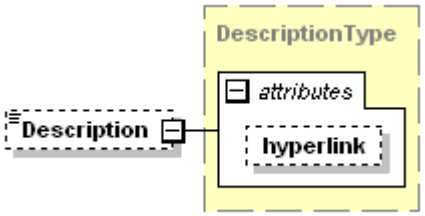
element **GenericVectorType/HistoryField**

diagram	
type	**HistoryFieldType**
attributes	Name / Type / Use / Default / Fixed / annotation DirectoryPath — **xsd:string** — optional — documentation: Path to the file location. This could be URL, relative, or absolute path. Filename — **xsd:string** — required — documentation: Filename with extension.
annotation	documentation List of fields within the vector feature file attribute table.

element **GenericVectorType/AggregationField**

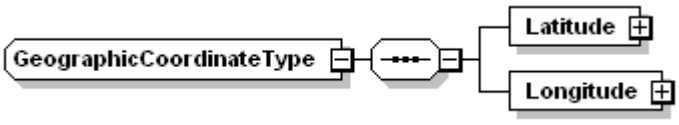
diagram	
type	**AggregationFieldType**
attributes	Name: DirectoryPath — Type: **xsd:string** — Use: required — annotation: documentation: Path to the file location. This path is relative to the location of this XML file. Name: Filename — Type: **xsd:string** — Use: required — annotation: documentation: Filename with extension.
annotation	documentation List files associates with the Vector data shape file.

element **GenericVectorType/Description**

diagram	
type	**DescriptionType**
attributes	Name: hyperlink — Type: **xsd:string** — Use — Default — Fixed — annotation
annotation	documentation Description of this vector data. The text for this description may be referenced in the hyperlink attribute.

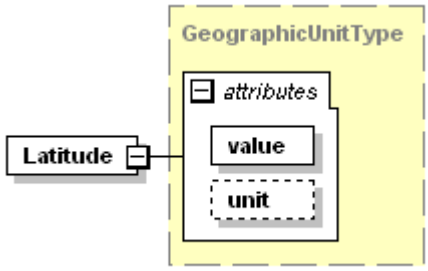
A.5.14 GeographicCoordinateType

complexType **GeographicCoordinateType**

diagram	

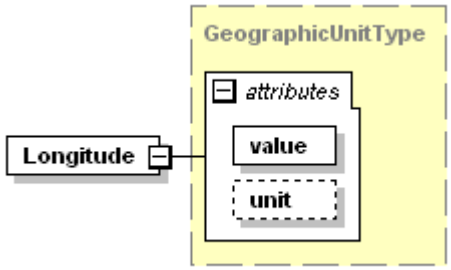
used by	elements	GeoreferenceType/SpatialDomain/LowerLeft GeoreferenceType/SpatialDomain/LowerRight ModelFeatureType/ModelOrigin GeoreferenceType/SpatialDomain/UpperLeft GeoreferenceType/SpatialDomain/UpperRight

element **GeographicCoordinateType/Latitude**

diagram	
type	GeographicUnitType

attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				

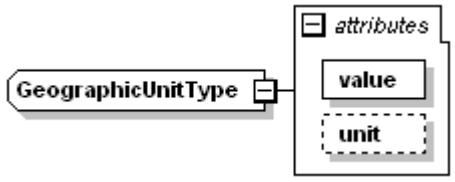
element **GeographicCoordinateType/Longitude**

diagram	
type	GeographicUnitType

attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				

A.5.15 GeographicUnitType

complexType **GeographicUnitType**

diagram	
used by	elements GeographicCoordinateType/Latitude GeographicCoordinateType/Longitude

attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				
annotation	documentation Complex-type: per-pixel size in spatial unit					

attribute **GeographicUnitType/@value**

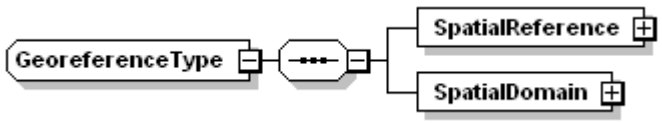
type	**xsd:double**

attribute **GeographicUnitType/@unit**

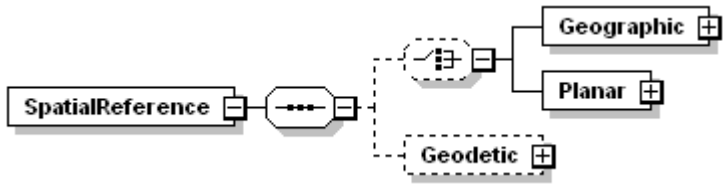
type	restriction of **xsd:string**		
facets	Kind	Value	annotation
	enumeration	DEGREES_LATLON	

A.5.16 GeoreferenceType

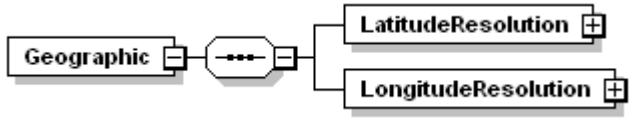
complexType **GeoreferenceType**

diagram	
used by	elements GenericRasterFileType/Georeference GenericVectorType/Georeference ModelFeatureType/Georeference

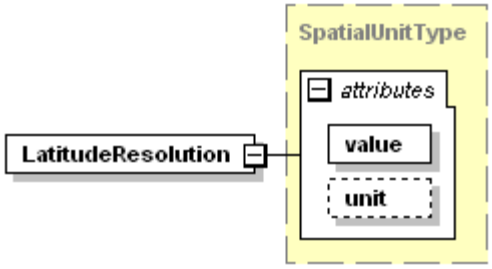
element **GeoreferenceType/SpatialReference**

diagram	
annotation	documentation The reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies.

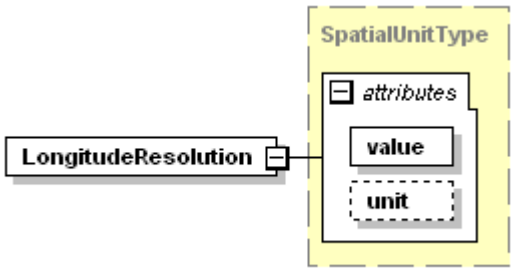
element **GeoreferenceType/SpatialReference/Geographic**

diagram	
annotation	documentation A global or spherical coordinate system.

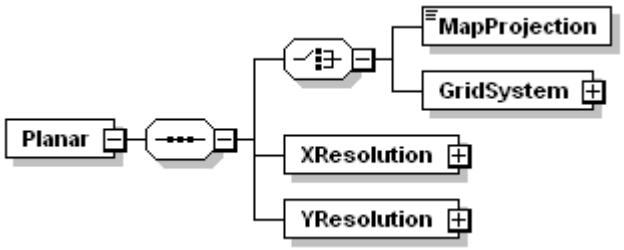
element **GeoreferenceType/SpatialReference/Geographic/LatitudeResolution**

diagram	
type	SpatialUnitType
attributes	Name: value — Type: xsd:double — Use: required Name: unit — Type: derived by: xsd:string
annotation	documentation The minimum difference between two adjacent latitude values expressed in Geographic Coordinate Units of measure.

element **GeoreferenceType/SpatialReference/Geographic/LongitudeResolution**

diagram	
type	SpatialUnitType
attributes	Name: value — Type: xsd:double — Use: required Name: unit — Type: derived by: xsd:string
annotation	documentation The minimum difference between two adjacent longitude values expressed in Geographic Coordinate Units of measure.

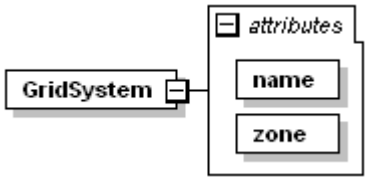
element **GeoreferenceType/SpatialReference/Planar**

diagram	
annotation	documentation Projected coordinate system.

element **GeoreferenceType/SpatialReference/Planar/MapProjection**

diagram	
type	**xsd:string**
annotation	documentation The name of a map projection system such as transverse Mercator, Albers equal area, or Robinson, all of which (along with numerous other map projection models) provide various mechanisms to project maps of the earth's spherical surface onto a two-dimensional Cartesian coordinate plane.

element **GeoreferenceType/SpatialReference/Planar/GridSystem**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation name — **derived by: xsd:string** — required zone — **xsd:string** — required
annotation	documentation A plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates.

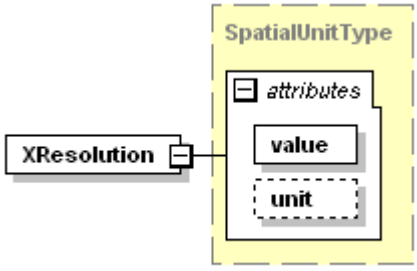
attribute **GeoreferenceType/SpatialReference/Planar/GridSystem/@name**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration — UTM enumeration — UPS enumeration — SPCS enumeration — ARC

attribute **GeoreferenceType/SpatialReference/Planar/GridSystem/@zone**

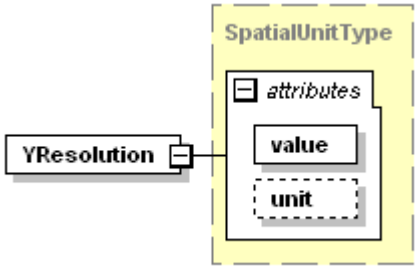
type	**xsd:string**

element **GeoreferenceType/SpatialReference/Planar/XResolution**

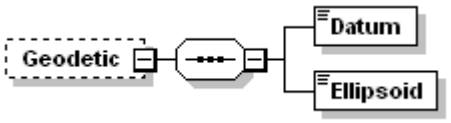
diagram	

type	**SpatialUnitType**
attributes	Name: value — Type: **xsd:double** — Use: required Name: unit — Type: **derived by: xsd:string**
annotation	documentation The (nominal) minimum distance between the "X" or column values of two adjacent points, expressed in a planar spatial distance unit of measure.

element **GeoreferenceType/SpatialReference/Planar/YResolution**

diagram	
type	**SpatialUnitType**
attributes	Name: value — Type: **xsd:double** — Use: required Name: unit — Type: **derived by: xsd:string**
annotation	documentation The (nominal) minimum distance between the "Y" or row values of two adjacent points, expressed in a planar spatial distance unit of measure.

element **GeoreferenceType/SpatialReference/Geodetic**

diagram	
annotation	documentation Parameters for the shape of the earth.

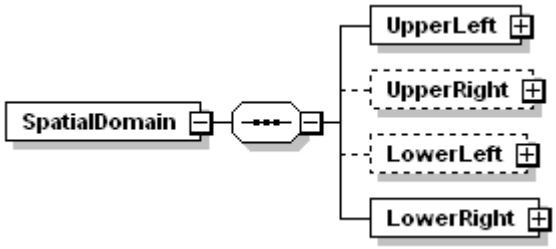
element **GeoreferenceType/SpatialReference/Geodetic/Datum**

diagram	
type	restriction of **xsd:string**
facets	Kind: enumeration — Value: NAD27 enumeration — NAD83 enumeration — WGS84
annotation	documentation Datum defines the position of the spheroid relative to the center of the earth. A datum provides a frame of reference for measuring locations on the surface of the earth. It defines the origin and orientation of latitude and longitude lines. The most recently developed and widely used datum is WGS84.

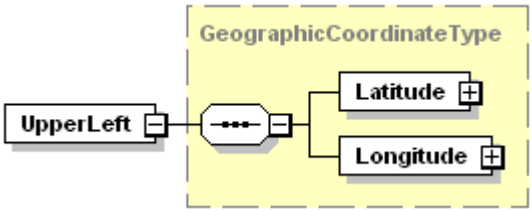
element **GeoreferenceType/SpatialReference/Geodetic/Ellipsoid**

diagram	
type	**xsd:string**
annotation	documentation Identification given to established representations of the Earth's shape.

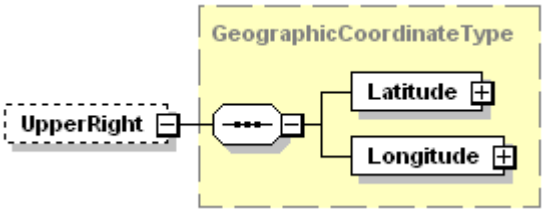
element **GeoreferenceType/SpatialDomain**

diagram	
annotation	documentation The limits of coverage of a dataset expressed by latitude and longitude values in decimal degrees. For datasets that include a complete band of latitude around the earth, the UpperLeft Longitude Coordinate shall be assigned the value -180.0, and the LowerRight Longitude Coordinate shall be assigned the value 180.0.

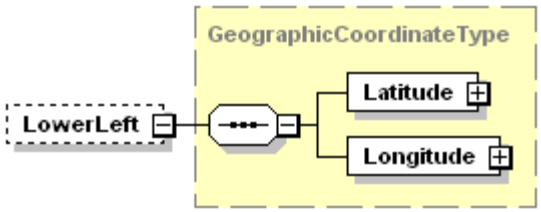
element **GeoreferenceType/SpatialDomain/UpperLeft**

diagram	
type	**GeographicCoordinateType**

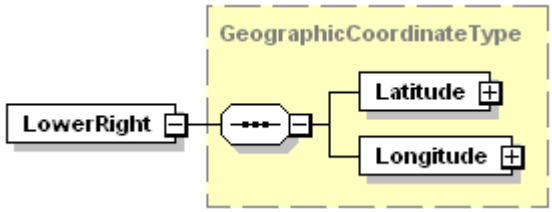
element **GeoreferenceType/SpatialDomain/UpperRight**

diagram	
type	**GeographicCoordinateType**

element **GeoreferenceType/SpatialDomain/LowerLeft**

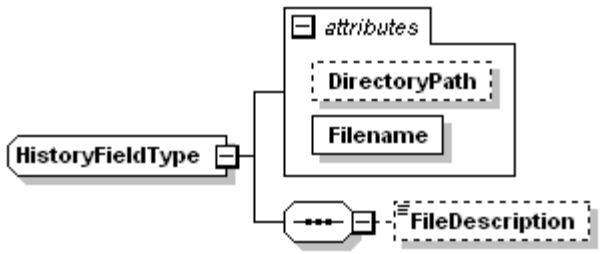
diagram	
type	GeographicCoordinateType

element **GeoreferenceType/SpatialDomain/LowerRight**

diagram	
type	GeographicCoordinateType

A.5.17 HistoryFieldType

complexType **HistoryFieldType**

diagram	
used by	elements GenericRasterFileType/HistoryField GenericVectorType/HistoryField ModelFeatureType/HistoryField TextureFeatureType/HistoryField
attributes	Name: DirectoryPath — Type: xsd:string — Use: optional — annotation documentation: Path to the file location. This could be URL, relative, or absolute path. Name: Filename — Type: xsd:string — Use: required — annotation documentation: Filename with extension.
annotation	documentation Complex-type: fields show the previous filenames and file paths. This field allows for multiple iterations that can trace back to the RAW image.

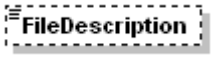
attribute **HistoryFieldType/@DirectoryPath**

type	**xsd:string**
annotation	documentation Path to the file location. This could be URL, relative, or absolute path.

attribute **HistoryFieldType/@Filename**

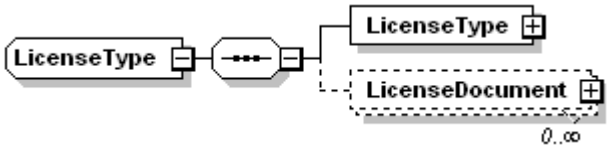
type	**xsd:string**
annotation	documentation Filename with extension.

element **HistoryFieldType/FileDescription**

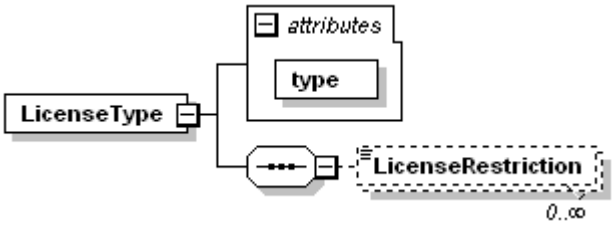
diagram	
annotation	documentation What changed in the file from the previous..

A.5.18 LicenseType

complexType **LicenseType**

diagram	
used by	elements **NPSIBase/NPSIIdentification/DatasetLicenseSummary** **FileRefType/License**
annotation	documentation Complex-type: restrictions and legal prerequisites for accessing and using the overall dataset or each data file.

element **LicenseType/LicenseType**

diagram	

attributes	Name	Type	Use	Default	Fixed	annotation
	type	**derived by: xsd:string**	required			documentation Name of the license owner: USARMY, USNAVY, USAIRFORCE, USMARINES, DOD, TITLE50, DOD_TITLE50, USGPR, RESTRICTED_USGPR, PUBLIC_DOMAIN, and

	UNKNOWN.

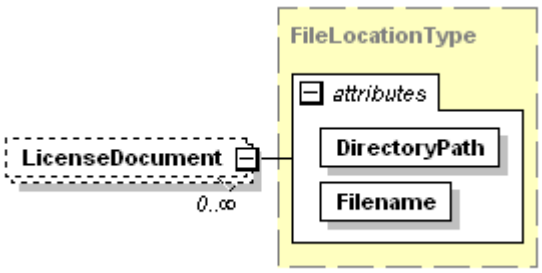
attribute **LicenseType/LicenseType/@type**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration USARMY enumeration USNAVY enumeration USAIRFORCE enumeration USMARINES enumeration DOD enumeration TITLE50 enumeration DOD_TITLE50 enumeration USGPR enumeration RESTRICTED_USGPR enumeration PUBLIC_DOMAIN enumeration UNKNOWN
annotation	documentation Name of the license owner: USARMY, USNAVY, USAIRFORCE, USMARINES, DOD, TITLE50, DOD_TITLE50, USGPR, RESTRICTED_USGPR, PUBLIC_DOMAIN, and UNKNOWN.

element **LicenseType/LicenseType/LicenseRestriction**

diagram	
type	**xsd:string**
annotation	documentation Additional information on license restrictions (free text).

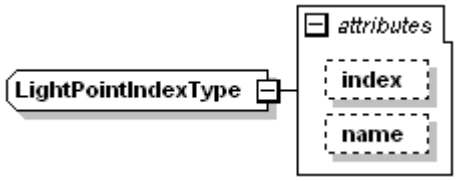
element **LicenseType/LicenseDocument**

diagram	
type	**FileLocationType**
attributes	Name / Type / Use / Default / Fixed / annotation DirectoryPath **xsd:string** required — documentation: Path to the file location. This path is relative to the location of this XML file. Filename **xsd:string** required — documentation

	Filename with extension.
annotation	documentation License document(s) describing the license restrictions.

A.5.19 LightPointIndexType

complexType **LightPointIndexType**

diagram	
used by	elements **DictionaryType/LightPointPalette/LightPointIndex** **LightPointPaletteType/LightPointIndex**

attributes

Name	Type	Use	Default	Fixed	annotation
index	**xsd:string**				documentation Integer palette index of light point type.
name	**xsd:string**				documentation Use standard light naming convention based on the light name domain.

attribute **LightPointIndexType/@index**

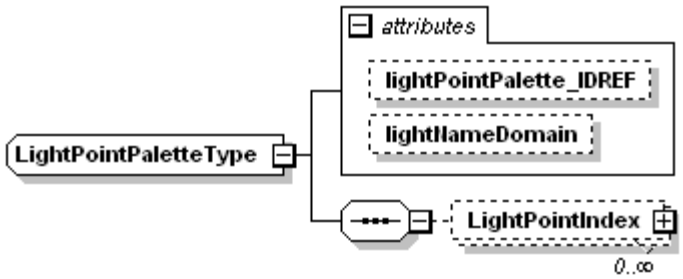
type	**xsd:string**
annotation	documentation Integer palette index of light point type.

attribute **LightPointIndexType/@name**

type	**xsd:string**
annotation	documentation Use standard light naming convention based on the light name domain.

A.5.20 LightPointPaletteType

complexType **LightPointPaletteType**

diagram	
used by	element **ModelFeatureType/LightPointPalette**
attributes	Name: lightPointPalette_IDREF — Type: **xsd:string** — Use — Default — Fixed — annotation: documentation: If defined, references a light point palette defined in the dictionary section. Otherwise, light point palette is listed here. Name: lightNameDomain — annotation: documentation: If standard light name or ID is used, indicate the name domain here. For example: CDB, LPRD, etc.

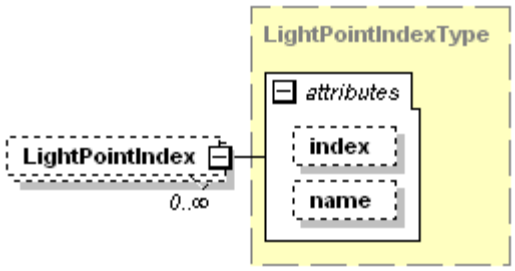
attribute **LightPointPaletteType/@lightPointPalette_IDREF**

type	**xsd:string**
annotation	documentation If defined, references a light point palette defined in the dictionary section. Otherwise, light point palette is listed here.

attribute **LightPointPaletteType/@lightNameDomain**

annotation	documentation If standard light name or ID is used, indicate the name domain here. For example: CDB, LPRD, etc.

element **LightPointPaletteType/LightPointIndex**

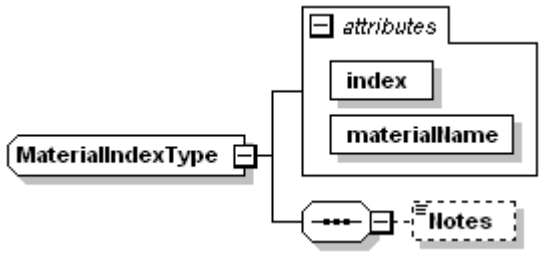
diagram	
type	LightPointIndexType

attributes

Name	Type	Use	Default	Fixed	annotation
index	**xsd:string**				documentation Integer palette index of light point type.
name	**xsd:string**				documentation Use standard light naming convention based on the light name domain.

A.5.21 MaterialIndexType

complexType **MaterialIndexType**

diagram	
used by	elements DictionaryType/MaterialPalette/LocalMaterialIndex MaterialPaletteType/LocalMaterialIndex

attributes

Name	Type	Use	Default	Fixed	annotation
index	**xsd:integer**	required			documentation Integer number that is encoded in the data. For example, is using raster pixel, this could be a value between 0 to 255.
materialName		required			documentation Spell the material name or ID exactly as defined under the

	material library or domain.
annotation	documentation Complex-type: maps an integer index to a material name defined by the material library or domain.

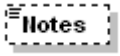
attribute **MaterialIndexType/@index**

type	**xsd:integer**
annotation	documentation Integer number that is encoded in the data. For example, is using raster pixel, this could be a value between 0 to 255.

attribute **MaterialIndexType/@materialName**

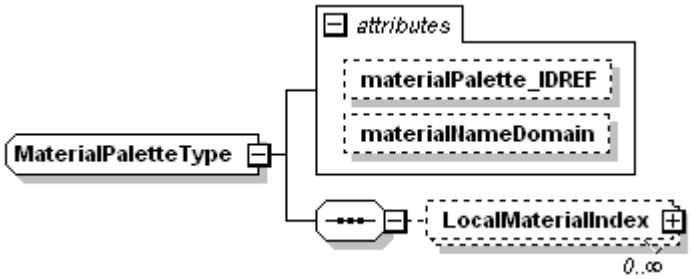
annotation	documentation Spell the material name or ID exactly as defined under the material library or domain.

element **MaterialIndexType/Notes**

diagram	
type	**xsd:string**
annotation	documentation Describe more detailed information regarding the material here.

A.5.22 MaterialPaletteType

complexType **MaterialPaletteType**

diagram	
used by	elements **RasterChannelType/MaterialIndex** **ModelFeatureType/PolygonMaterialPalette**
attributes	Name: materialPalette_IDREF Type: **xsd:string** Use: Default: Fixed: annotation documentation If defined, references a material palette defined in the dictionary. Otherwise, material palette is defined locally. -- Changed to string type--

	materialNameDomain	documentation If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER, etc.
annotation	documentation Complex-type: provides a mapping of local material ID's to MPRD material IDs in the MPRD archive.	

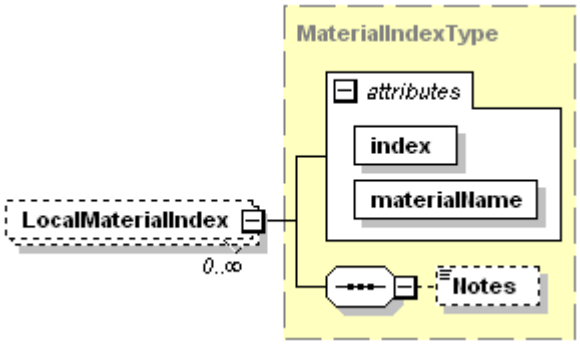
attribute **MaterialPaletteType/@materialPalette_IDREF**

type	**xsd:string**
annotation	documentation If defined, references a material palette defined in the dictionary. Otherwise, material palette is defined locally. --Changed to string type--

attribute **MaterialPaletteType/@materialNameDomain**

annotation	documentation If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER, etc.

element **MaterialPaletteType/LocalMaterialIndex**

diagram	
type	**MaterialIndexType**

attributes

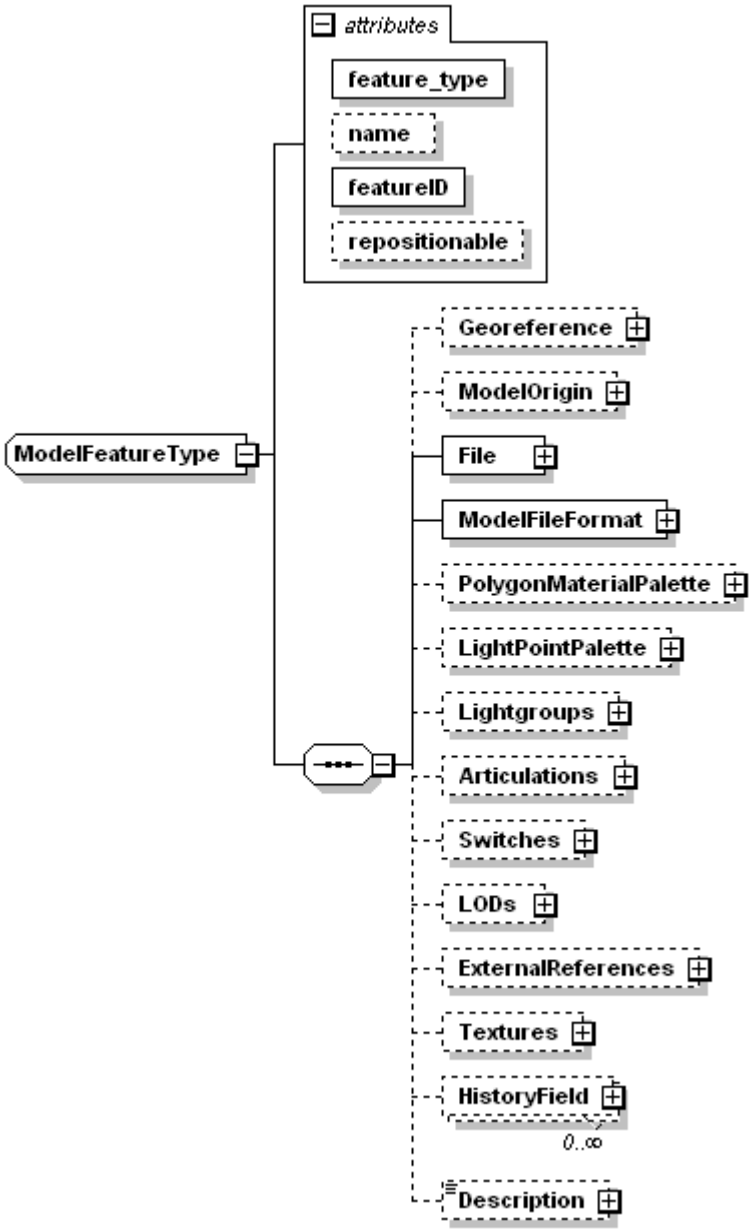
Name	Type	Use	Default	Fixed	annotation
index	**xsd:integer**	required			documentation Integer number that is encoded in the data. For example, is using raster pixel, this could be a value between 0 to 255.
materialName		required			documentation Spell the material name or ID exactly as defined under the

	material library or domain.
annotation	documentation Provides a mapping of local material ID's to MPRD IDs in the MPRD archive.

A.5.23 ModelFeatureType

complexType **ModelFeatureType**

diagram



used by	element **NPSIBase/NPSIDataset/CulturalFeatureData/ModelFeature**

attributes

Name	Type	Use	Default	Fixed	annotation
feature_type	**derived by: xsd:string**	required			documentation Type of model feature air,

				ground, sea, etc.
	name	**xsd:string**		documentation Short name of model.
	featureID	**xsd:ID**	required	documentation Unique ID that identifies the cultural feature.
	repositionable	**derived by: xsd:boolean**		documentation If the model is repositionable, then this element is TRUE, otherwise if static the element is FALSE. If the model is static, then Georeference element is mandatory.
annotation	documentation Complex-type: static or moving/repositionable 3D model data.			

attribute **ModelFeatureType/@feature_type**

type	restriction of **xsd:string**		
facets	Kind	Value	annotation
	enumeration	AIR	
	enumeration	GROUND	
	enumeration	MUNITION	
	enumeration	OWNSHIP	
	enumeration	SEA	
	enumeration	SLING_LOAD	
	enumeration	MODEL	
	enumeration	LIGHT	
annotation	documentation Type of model feature air, ground, sea, etc.		

attribute **ModelFeatureType/@name**

type	**xsd:string**
annotation	documentation Short name of model.

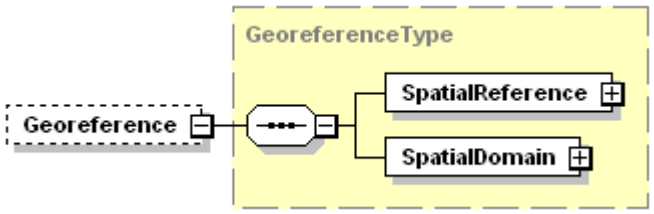
attribute **ModelFeatureType/@featureID**

type	**xsd:ID**
annotation	documentation Unique ID that identifies the cultural feature.

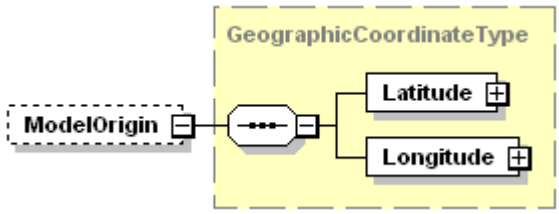
attribute **ModelFeatureType/@repositionable**

type	restriction of **xsd:boolean**
annotation	documentation If the model is repositionable, then this element is TRUE, otherwise if static the element is FALSE. If the model is static, then Georeference element is mandatory.

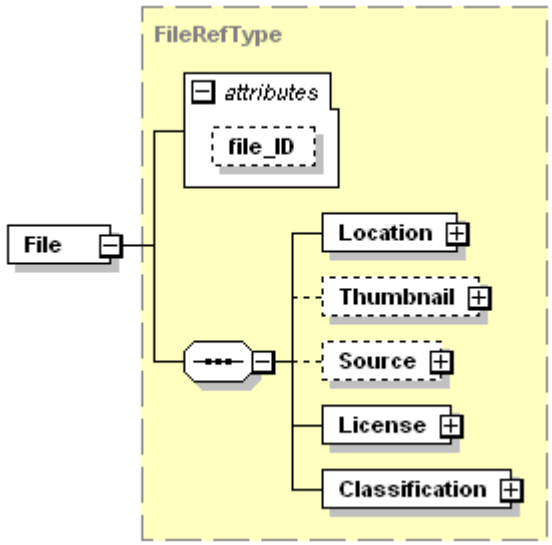
element **ModelFeatureType/Georeference**

diagram	
type	GeoreferenceType

element **ModelFeatureType/ModelOrigin**

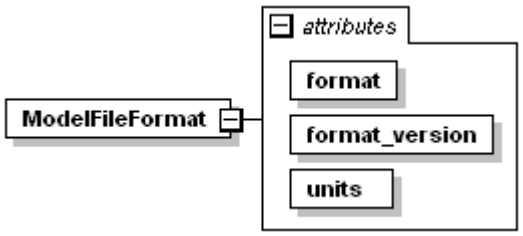
diagram	
type	GeographicCoordinateType
annotation	documentation If the model is static, then define the model origin location here. Geographic coordinate of the origin of the model file.

element **ModelFeatureType/File**

diagram	

type	**FileRefType**
attributes	Name: file_ID; Type: **xsd:ID**; Use: ; Default: ; Fixed: ; annotation: documentation: File ID is required only if this file is being referenced within this document.
annotation	documentation: Physical location of model feature file.

element **ModelFeatureType/ModelFileFormat**

diagram	
attributes	Name: format; Type: **derived by: xsd:string**; Use: required; Default: ; Fixed: ; annotation: documentation: Model file format (currently restricted to OpenFlight). Name: format_version; Type: **xsd:string**; Use: required; annotation: documentation: File format version, i.e. 15.7, 15.8, etc. Name: units; Type: **derived by: xsd:string**; Use: required; annotation: documentation: The unit type of the models dimensions, i.e. meters, feet.
annotation	documentation: Definition of model format.

attribute **ModelFeatureType/ModelFileFormat/@format**

type	restriction of **xsd:string**
facets	Kind: enumeration; Value: OPENFLIGHT; annotation:
annotation	documentation: Model file format (currently restricted to OpenFlight).

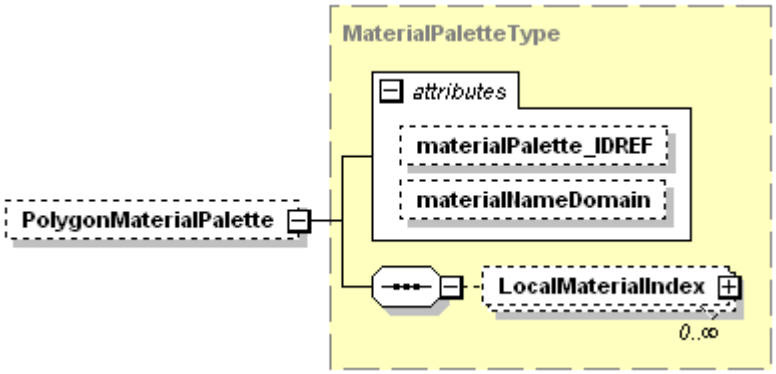
attribute **ModelFeatureType/ModelFileFormat/@format_version**

type	**xsd:string**
annotation	documentation: File format version, i.e. 15.7, 15.8, etc.

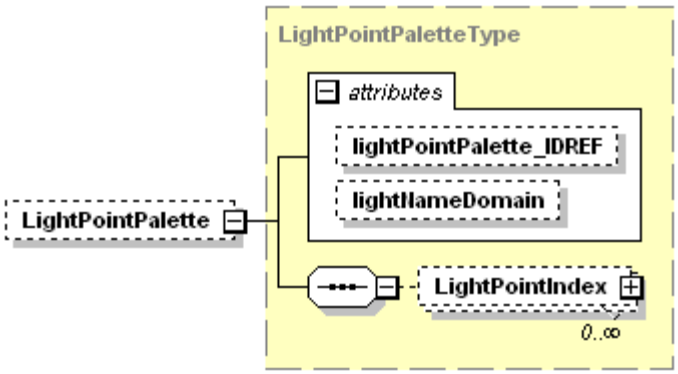
attribute **ModelFeatureType/ModelFileFormat/@units**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration METERS enumeration FEET
annotation	documentation The unit type of the models dimensions, i.e. meters, feet.

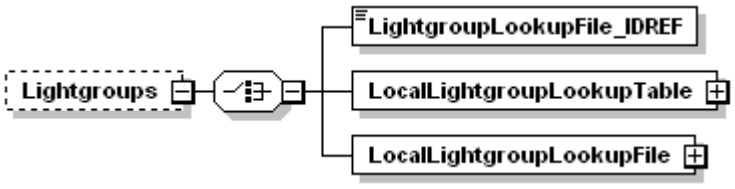
element **ModelFeatureType/PolygonMaterialPalette**

diagram	
type	**MaterialPaletteType**
attributes	Name / Type / Use / Default / Fixed / annotation materialPalette_IDREF **xsd:string** — documentation: If defined, references a material palette defined in the dictionary. Otherwise, material palette is defined locally. -- Changed to string type-- materialNameDomain — documentation: If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER, etc.
annotation	documentation Polygonal material index palette.

element **ModelFeatureType/LightPointPalette**

diagram	
type	**LightPointPaletteType**
attributes	Name / Type / Use / Default / Fixed / annotation lightPointPalette_IDREF — **xsd:string** — documentation: If defined, references a light point palette defined in the dictionary section. Otherwise, light point palette is listed here. lightNameDomain — documentation: If standard light name or ID is used, indicate the name domain here. For example: CDB, LPRD, etc.
annotation	documentation Contains a list of Light Point Palette Appearance index from the OpenFlight file.

element **ModelFeatureType/Lightgroups**

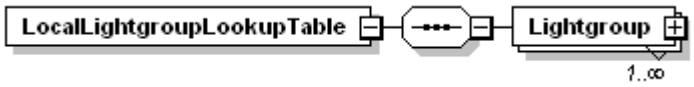
diagram	
annotation	documentation Contains a list of light feature groups and assigned numerical IDs that can be controlled externally.

element **ModelFeatureType/Lightgroups/LightgroupLookupFile_IDREF**

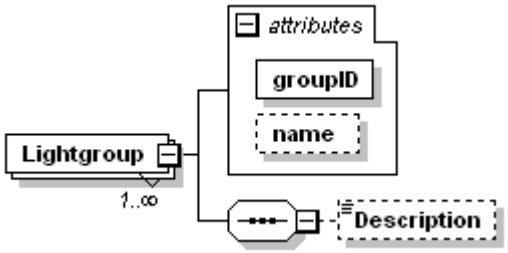
diagram	
type	**xsd:string**

annotation	documentation If defined, references a file in the dictionary, otherwise use local lookup definition.

element **ModelFeatureType/Lightgroups/LocalLightgroupLookupTable**

diagram	
annotation	documentation Locally defined table of lightgroups and descriptions within XML document.

element **ModelFeatureType/Lightgroups/LocalLightgroupLookupTable/Lightgroup**

diagram						
attributes	Name	Type	Use	Default	Fixed	annotation
	groupID	**xsd:integer**	required			documentation Numerical ID used to control light group.
	name	**xsd:string**				documentation Name of light group, i.e. Landing Lights.
annotation	documentation Light control group.					

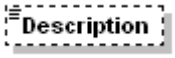
attribute **ModelFeatureType/Lightgroups/LocalLightgroupLookupTable/Lightgroup/@groupID**

type	**xsd:integer**
annotation	documentation Numerical ID used to control light group.

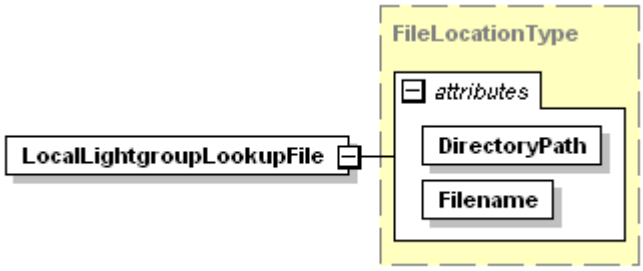
attribute **ModelFeatureType/Lightgroups/LocalLightgroupLookupTable/Lightgroup/@name**

type	**xsd:string**
annotation	documentation Name of light group, i.e. Landing Lights.

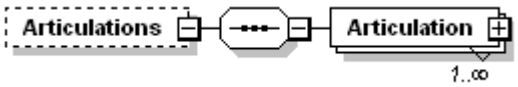
element **ModelFeatureType/Lightgroups/LocalLightgroupLookupTable/Lightgroup/Description**

diagram	
type	**xsd:string**
annotation	documentation Description of the light group.

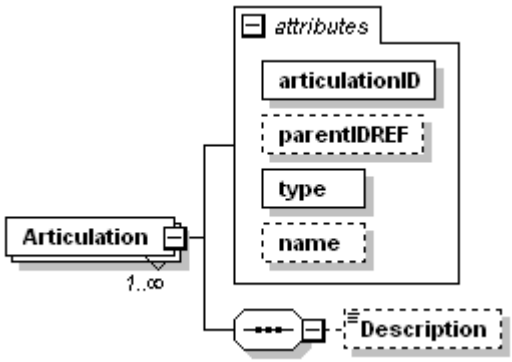
element **ModelFeatureType/Lightgroups/LocalLightgroupLookupFile**

diagram	
type	**FileLocationType**
attributes	Name / Type / Use / Default / Fixed / annotation DirectoryPath — **xsd:string** — required — documentation: Path to the file location. This path is relative to the location of this XML file. Filename — **xsd:string** — required — documentation: Filename with extension.
annotation	documentation Locally referenced lookup file external to the XML document.

element **ModelFeatureType/Articulations**

diagram	
annotation	documentation Contains a list of articulations within the model.

element **ModelFeatureType/Articulations/Articulation**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation articulationID — **xsd:string** — required — documentation: Numerical ID used to control the articulation.

	parentIDREF	**xsd:string**		documentation ID of parent control, switch, LOD, etc.
	type	**derived by:** **xsd:string**	required	documentation The type of articulation, i.e. rotate, scale, translate, etc.
	name	**xsd:string**		documentation Short name of articulation.
annotation	documentation Model articulation definition.			

attribute **ModelFeatureType/Articulations/Articulation/@articulationID**

type	**xsd:string**
annotation	documentation Numerical ID used to control the articulation.

attribute **ModelFeatureType/Articulations/Articulation/@parentIDREF**

type	**xsd:string**
annotation	documentation ID of parent control, switch, LOD, etc.

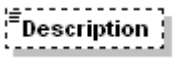
attribute **ModelFeatureType/Articulations/Articulation/@type**

type	restriction of **xsd:string**		
facets	Kind	Value	annotation
	enumeration	rotate	
	enumeration	translate	
	enumeration	scale	
annotation	documentation The type of articulation, i.e. rotate, scale, translate, etc.		

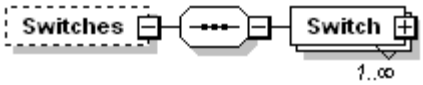
attribute **ModelFeatureType/Articulations/Articulation/@name**

type	**xsd:string**
annotation	documentation Short name of articulation.

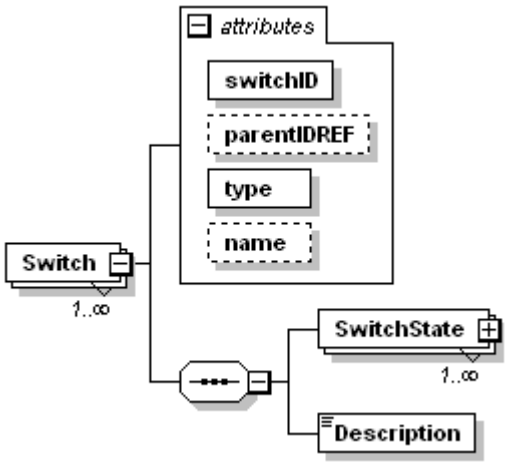
element **ModelFeatureType/Articulations/Articulation/Description**

diagram	
type	**xsd:string**
annotation	documentation Description of the articulation.

element **ModelFeatureType/Switches**

diagram	
annotation	documentation Contains a list of switch nodes that can be controlled externally.

element **ModelFeatureType/Switches/Switch**

diagram	

attributes

Name	Type	Use	Default	Fixed	annotation
switchID	**xsd:string**	required			documentation ID of switch control.
parentIDREF	**xsd:string**				documentation ID of parent control, switch, LOD, etc.
type	**derived by: xsd:string**	required			documentation Type of switch control, i.e. time of day, damage states, etc.
name	**xsd:string**				documentation Name of switch node, i.e. tod, damage, paint, etc.

annotation	documentation Switch node definition.

attribute **ModelFeatureType/Switches/Switch/@switchID**

type	**xsd:string**
annotation	documentation ID of switch control.

attribute **ModelFeatureType/Switches/Switch/@parentIDREF**

type	**xsd:string**

annotation	documentation ID of parent control, switch, LOD, etc.

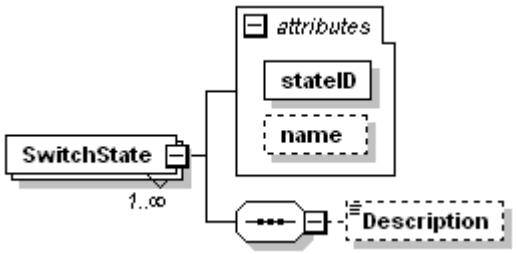
attribute **ModelFeatureType/Switches/Switch/@type**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration TIME_OF_DAY enumeration DAMAGE_STATES enumeration PAINT_SCHEME
annotation	documentation Type of switch control, i.e. time of day, damage states, etc.

attribute **ModelFeatureType/Switches/Switch/@name**

type	**xsd:string**
annotation	documentation Name of switch node, i.e. tod, damage, paint, etc.

element **ModelFeatureType/Switches/Switch/SwitchState**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation stateID **xsd:string** required — documentation: ID of switch state, i.e. 0,1,2, etc. name **xsd:string** — documentation: Name of switch state, i.e. damaged, undamaged, day, night, etc.
annotation	documentation Single state of switch control.

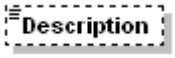
attribute **ModelFeatureType/Switches/Switch/SwitchState/@stateID**

type	**xsd:string**
annotation	documentation ID of switch state, i.e. 0,1,2, etc.

attribute **ModelFeatureType/Switches/Switch/SwitchState/@name**

type	**xsd:string**
annotation	documentation Name of switch state, i.e. damaged, undamaged, day, night, etc.

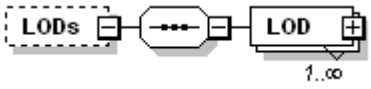
element **ModelFeatureType/Switches/Switch/SwitchState/Description**

diagram	
type	**xsd:string**
annotation	documentation Description of switch state.

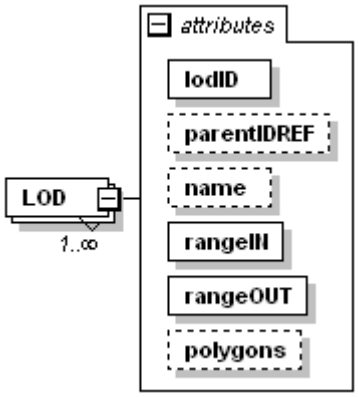
element **ModelFeatureType/Switches/Switch/Description**

diagram	
type	**xsd:string**
annotation	documentation Description of switch node function.

element **ModelFeatureType/LODs**

diagram	
annotation	documentation List of model Levels of Detail.

element **ModelFeatureType/LODs/LOD**

diagram	

attributes

Name	Type	Use	Default	Fixed	annotation
lodID	**xsd:string**	required			documentation ID of LOD control.
parentIDREF	**xsd:string**				documentation ID of parent control, switch, LOD, etc.
name	**xsd:string**				documentation Short name of LOD.
rangeIN	**xsd:integer**	required			documentation

	rangeOUT	**xsd:integer**	required	Distance (in meters) from the model at which the LOD becomes visible. documentation Distance (in meters) from the model at which the LOD becomes invisible.
	polygons	**xsd:integer**		documentation Number of total polygons within this LOD.
annotation	documentation Level of Detail.			

attribute **ModelFeatureType/LODs/LOD/@lodID**

type	**xsd:string**
annotation	documentation ID of LOD control.

attribute **ModelFeatureType/LODs/LOD/@parentIDREF**

type	**xsd:string**
annotation	documentation ID of parent control, switch, LOD, etc.

attribute **ModelFeatureType/LODs/LOD/@name**

type	**xsd:string**
annotation	documentation Short name of LOD.

attribute **ModelFeatureType/LODs/LOD/@rangeIN**

type	**xsd:integer**
annotation	documentation Distance (in meters) from the model at which the LOD becomes visible.

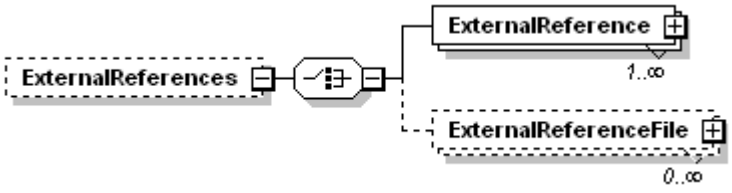
attribute **ModelFeatureType/LODs/LOD/@rangeOUT**

type	**xsd:integer**
annotation	documentation Distance (in meters) from the model at which the LOD becomes invisible.

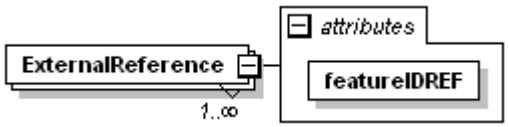
attribute **ModelFeatureType/LODs/LOD/@polygons**

type	**xsd:integer**
annotation	documentation Number of total polygons within this LOD.

element **ModelFeatureType/ExternalReferences**

diagram	
annotation	documentation List of externally referenced models.

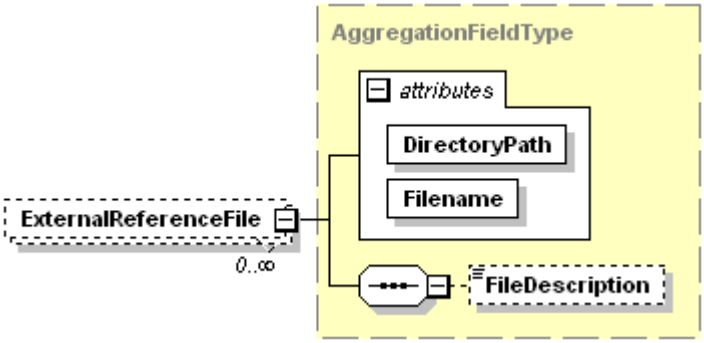
element **ModelFeatureType/ExternalReferences/ExternalReference**

diagram						
attributes	Name featureIDREF	Type **xsd:string**	Use required	Default	Fixed	annotation documentation ID of externally referenced model file.
annotation	documentation External model definition.					

attribute **ModelFeatureType/ExternalReferences/ExternalReference/@featureIDREF**

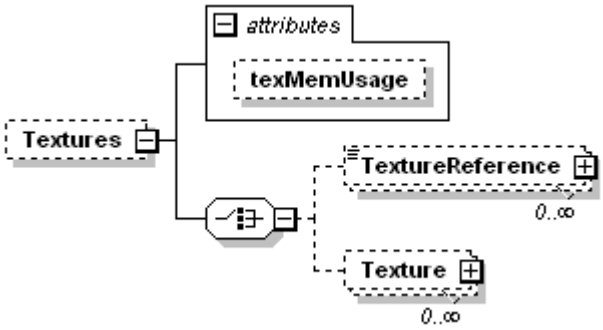
type	**xsd:string**
annotation	documentation ID of externally referenced model file.

element **ModelFeatureType/ExternalReferences/ExternalReferenceFile**

diagram						
type	**AggregationFieldType**					
attributes	Name DirectoryPath	Type **xsd:string**	Use required	Default	Fixed	annotation documentation Path to the file location. This path is relative to the location

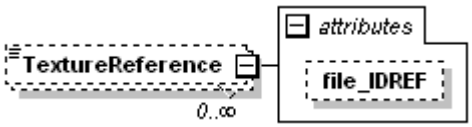
	Filename	**xsd:string**	required	of this XML file. documentation Filename with extension.

element **ModelFeatureType/Textures**

diagram	
attributes	Name: texMemUsage; Type; Use; Default; Fixed; annotation
annotation	documentation List of textures referenced by the model.

attribute **ModelFeatureType/Textures/@texMemUsage**

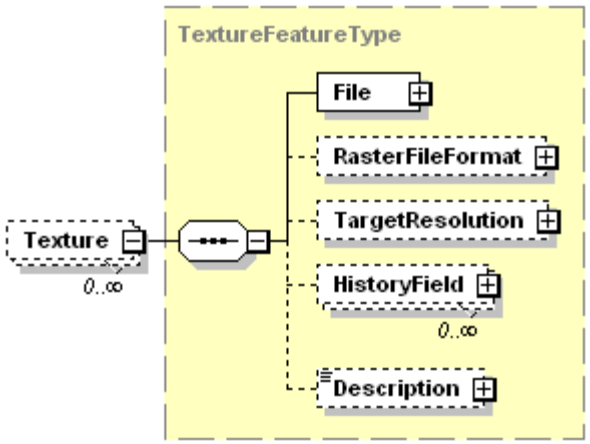
element **ModelFeatureType/Textures/TextureReference**

diagram	
type	extension of **xsd:IDREF**
attributes	Name: file_IDREF; Type: **xsd:IDREF**; Use; Default; Fixed; annotation
annotation	documentation Refer to a texture file defined in this document.

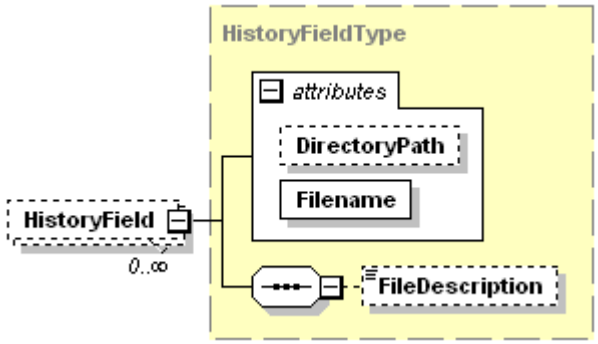
attribute **ModelFeatureType/Textures/TextureReference/@file_IDREF**

type	**xsd:IDREF**

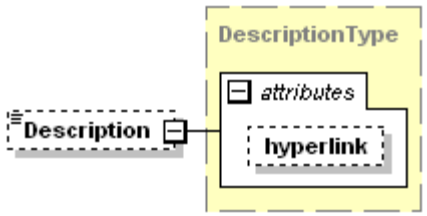
element **ModelFeatureType/Textures/Texture**

diagram	
type	**TextureFeatureType**

element **ModelFeatureType/HistoryField**

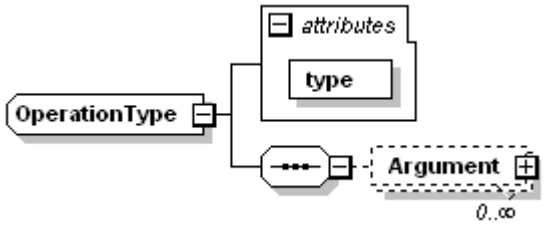
diagram						
type	**HistoryFieldType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	DirectoryPath	**xsd:string**	optional			documentation Path to the file location. This could be URL, relative, or absolute path.
	Filename	**xsd:string**	required			documentation Filename with extension.
annotation	documentation List of fields within the vector feature file attribute table.					

element **ModelFeatureType/Description**

diagram	
type	**DescriptionType**
attributes	Name: hyperlink; Type: **xsd:string**; Use: ; Default: ; Fixed: ; annotation:
annotation	documentation: Description of model.

A.5.24 OperationType

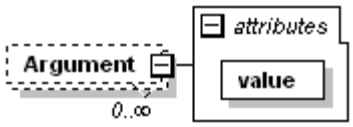
complexType **OperationType**

diagram	
used by	element **PixelMappingType/Operation**
attributes	Name: type; Type: **derived by: xsd:string**; Use: required; Default: ; Fixed: ; annotation:

attribute **OperationType/@type**

type	restriction of **xsd:string**
facets	Kind / Value / annotation: enumeration LINEAR enumeration SCALE enumeration OFFSET enumeration LOG10 enumeration LOGE enumeration NORMALIZE enumeration LOG10NORM enumeration LOGENORM enumeration POWER enumeration THRESHOLD

element **OperationType/Argument**

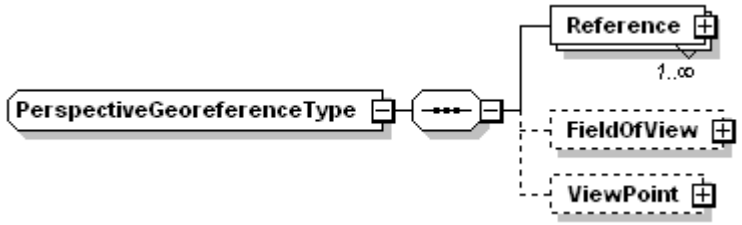
diagram	
attributes	Name: value; Type: **xsd:double**; Use: required; Default; Fixed; annotation

attribute **OperationType/Argument/@value**

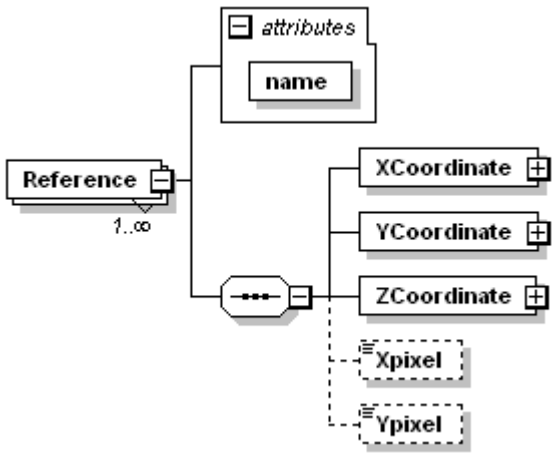
type	**xsd:double**

A.5.25 PerspectiveGeoreferenceType

complexType **PerspectiveGeoreferenceType**

diagram	
used by	element **GenericRasterFileType/PerspectiveReference**
annotation	documentation Complex-type: data structure intended for defining geographic references in a perspective image.

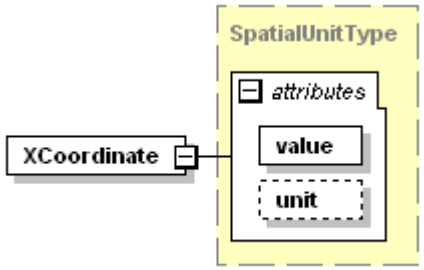
element **PerspectiveGeoreferenceType/Reference**

diagram	
attributes	Name: name; Type: **xsd:string**; Use: required; Default; Fixed; annotation

attribute **PerspectiveGeoreferenceType/Reference/@name**

type	**xsd:string**

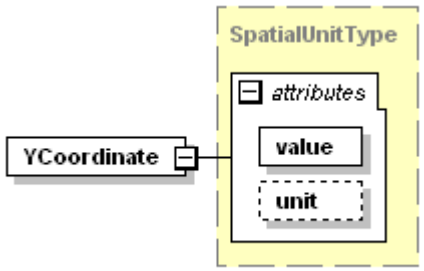
element **PerspectiveGeoreferenceType/Reference/XCoordinate**

diagram	
type	**SpatialUnitType**

attributes

Name	Type	Use	Default	Fixed	annotation
value	**xsd:double**	required			
unit	**derived by: xsd:string**				

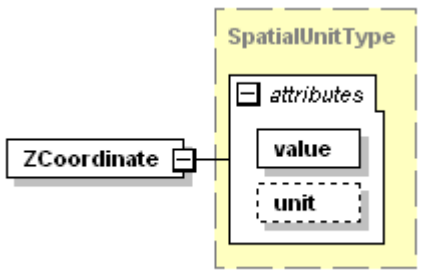
element **PerspectiveGeoreferenceType/Reference/YCoordinate**

diagram	
type	**SpatialUnitType**

attributes

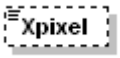
Name	Type	Use	Default	Fixed	annotation
value	**xsd:double**	required			
unit	**derived by: xsd:string**				

element **PerspectiveGeoreferenceType/Reference/ZCoordinate**

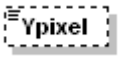
diagram	

type	SpatialUnitType					
attributes	Name	Type	Use	Default	Fixed	annotation
	value	xsd:double	required			
	unit	derived by: xsd:string				

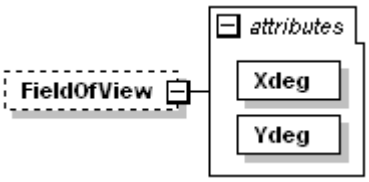
element **PerspectiveGeoreferenceType/Reference/Xpixel**

diagram	
type	**xsd:integer**

element **PerspectiveGeoreferenceType/Reference/Ypixel**

diagram	
type	**xsd:integer**

element **PerspectiveGeoreferenceType/FieldOfView**

diagram						
attributes	Name	Type	Use	Default	Fixed	annotation
	Xdeg	xsd:decimal	required			
	Ydeg	xsd:decimal	required			

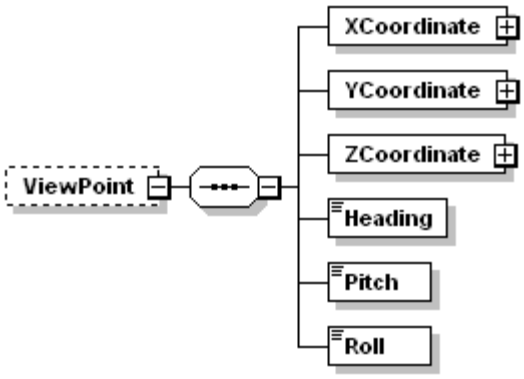
attribute **PerspectiveGeoreferenceType/FieldOfView/@Xdeg**

type	**xsd:decimal**

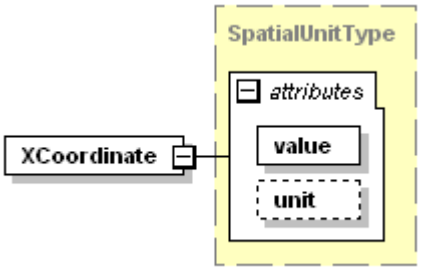
attribute **PerspectiveGeoreferenceType/FieldOfView/@Ydeg**

type	**xsd:decimal**

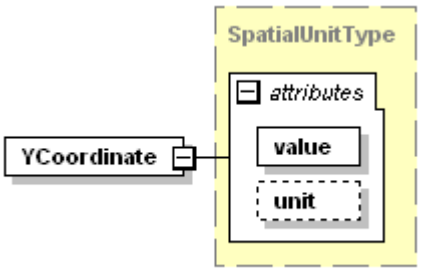
element **PerspectiveGeoreferenceType/ViewPoint**

diagram	
annotation	documentation View or Camera Geo Location and orientation.

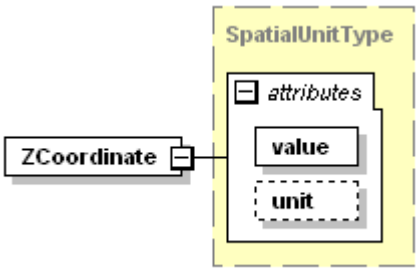
element **PerspectiveGeoreferenceType/ViewPoint/XCoordinate**

diagram	
type	**SpatialUnitType**
attributes	Name: value — Type: **xsd:double** — Use: required Name: unit — Type: **derived by: xsd:string**

element **PerspectiveGeoreferenceType/ViewPoint/YCoordinate**

diagram	
type	**SpatialUnitType**
attributes	Name: value — Type: **xsd:double** — Use: required Name: unit — Type: **derived by: xsd:string**

element **PerspectiveGeoreferenceType/ViewPoint/ZCoordinate**

diagram	
type	**SpatialUnitType**

attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				

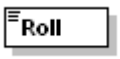
element **PerspectiveGeoreferenceType/ViewPoint/Heading**

diagram	
type	**xsd:decimal**

element **PerspectiveGeoreferenceType/ViewPoint/Pitch**

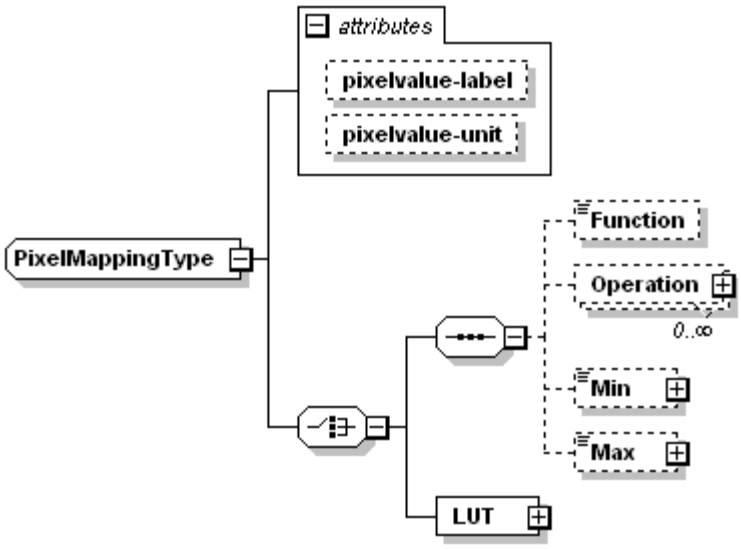
diagram	
type	**xsd:decimal**

element **PerspectiveGeoreferenceType/ViewPoint/Roll**

diagram	
type	**xsd:decimal**

A.5.26 PixelMappingType

complexType **PixelMappingType**

diagram	
used by	elements RasterChannelType/Color/PixelMapping RasterChannelType/Alpha/PixelMapping RasterChannelType/Reflectivity/PixelMapping RasterChannelType/Reflection/PixelMapping RasterChannelType/Radiance/PixelMapping RasterChannelType/Irradiance/PixelMapping RasterChannelType/MaterialProperty/PixelMapping RasterChannelType/Elevation/PixelMapping RasterChannelType/HorizonMap/PixelMapping
attributes	Name / Type / Use / Default / Fixed / annotation pixelvalue-label **xsd:string** pixelvalue-unit **xsd:string**
annotation	documentation Complex-type: template data structure describing relationship between pixel values found in a channel and physical quantities.

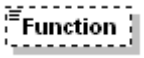
attribute **PixelMappingType/@pixelvalue-label**

type	**xsd:string**

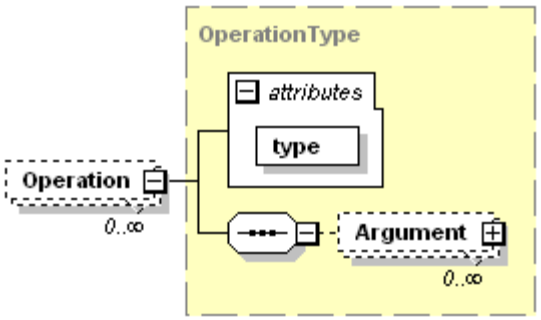
attribute **PixelMappingType/@pixelvalue-unit**

type	**xsd:string**

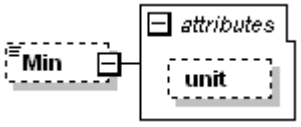
element **PixelMappingType/Function**

diagram	
type	**xsd:string**
annotation	documentation Mapping function type: linear (y=ax+b) , gamma (y=x^g) or logarithmic (y = log(x)).

element **PixelMappingType/Operation**

diagram	
type	**OperationType**
attributes	Name: type; Type: **derived by: xsd:string**; Use: required; Default: ; Fixed: ; annotation:
annotation	documentation A sequence of ENCODING operations performed to derive the pixel values.

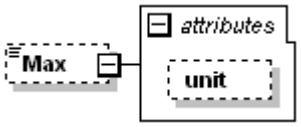
element **PixelMappingType/Min**

diagram	
type	extension of **xsd:double**
attributes	Name: unit; Type: **xsd:string**; Use: ; Default: ; Fixed: ; annotation:
annotation	documentation Minimum value before encoding in the physical unit.

attribute **PixelMappingType/Min/@unit**

type	**xsd:string**

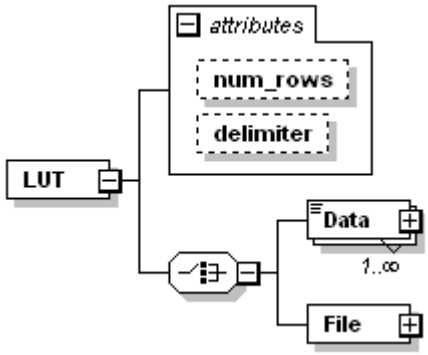
element **PixelMappingType/Max**

diagram	
type	extension of **xsd:double**
attributes	Name: unit; Type: **xsd:string**; Use: ; Default: ; Fixed: ; annotation:
annotation	documentation Maximum value before encoding in the physical unit.

attribute **PixelMappingType/Max/@unit**

type	**xsd:string**

element **PixelMappingType/LUT**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation num_rows — **xsd:integer** delimiter — **derived by: xsd:string**

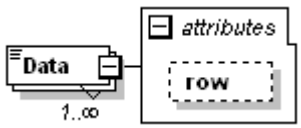
attribute **PixelMappingType/LUT/@num_rows**

type	**xsd:integer**

attribute **PixelMappingType/LUT/@delimiter**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration , enumeration /s enumeration /t enumeration ;

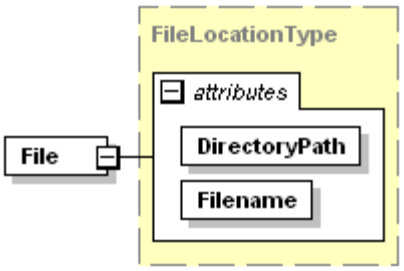
element **PixelMappingType/LUT/Data**

diagram	
type	extension of **xsd:string**
attributes	Name / Type / Use / Default / Fixed / annotation row — **xsd:integer** — optional

attribute **PixelMappingType/LUT/Data/@row**

type	**xsd:integer**

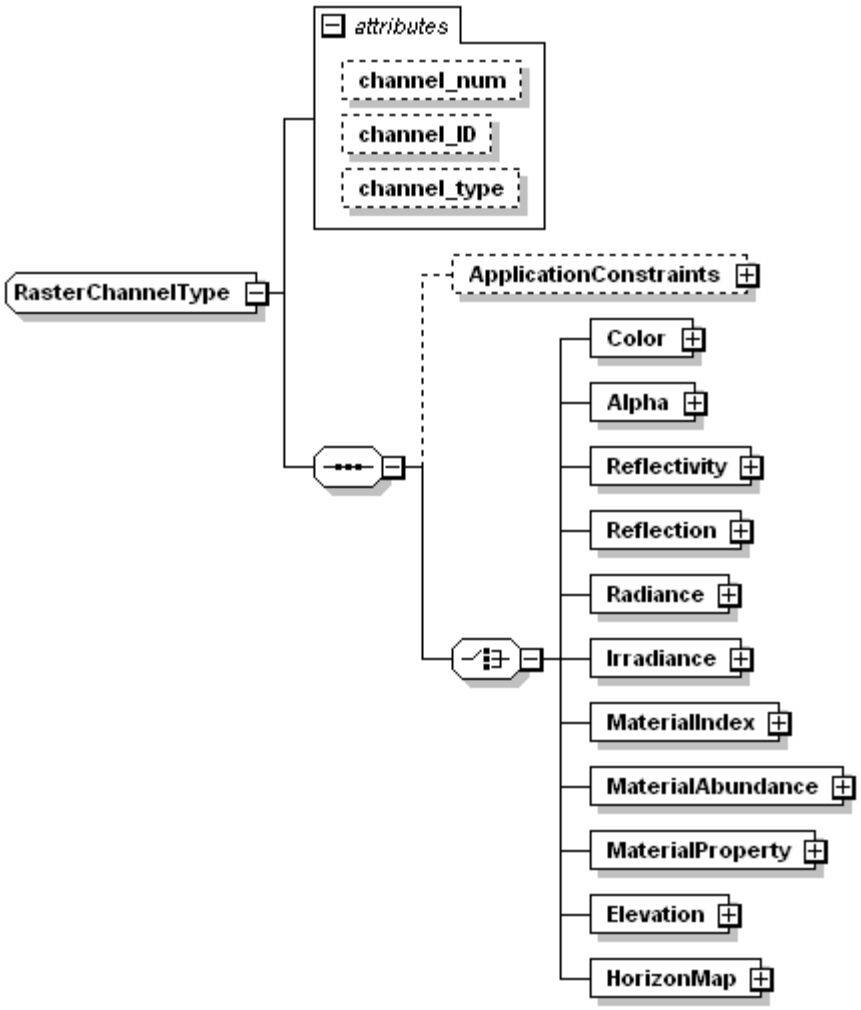
element **PixelMappingType/LUT/File**

diagram						
type	**FileLocationType**					
attributes	Name	Type	Use	Default	Fixed	annotation
	DirectoryPath	**xsd:string**	required			documentation Path to the file location. This path is relative to the location of this XML file.
	Filename	**xsd:string**	required			documentation Filename with extension.

A.5.27 RasterChannelType

complexType **RasterChannelType**

diagram



used by

element **RasterFileFormatType/Channel**

attributes

Name	Type	Use	Default	Fixed	annotation
channel_num	**derived by: xsd:string**				
channel_ID	**xsd:ID**				documentation Channel_ID is a unique ID in a XML document. This is an optional attribute; used when it is necessary to reference this channel from another raster file.
channel_type	**derived by: xsd:string**				

annotation

documentation

Complex-type: template data structure describing a channel.

attribute **RasterChannelType/@channel_num**

type	restriction of **xsd:string**

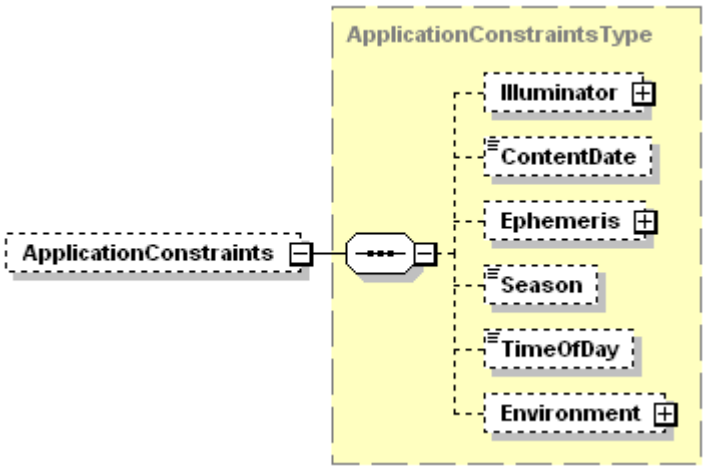
attribute **RasterChannelType/@channel_ID**

type	**xsd:ID**
annotation	documentation Channel_ID is a unique ID in a XML document. This is an optional attribute; used when it is necessary to reference this channel from another raster file.

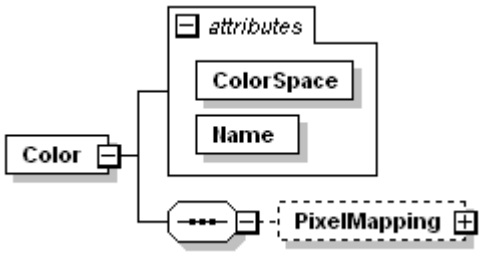
attribute **RasterChannelType/@channel_type**

type	restriction of **xsd:string**		
facets	Kind	Value	annotation
	enumeration	RED	
	enumeration	GREEN	
	enumeration	BLUE	
	enumeration	ELEVATION	
	enumeration	MATERIALINDEX	
	enumeration	MATERIALABUNDANCE	
	enumeration	MATERIALPROPERTY	
	enumeration	RADIANCE	
	enumeration	IRRADIANCE	
	enumeration	REFLECTIVITY	
	enumeration	HORIZONMAP	
	enumeration	REFLECTION	
	enumeration	ALPHA	

element **RasterChannelType/ApplicationConstraints**

diagram	
type	ApplicationConstraintsType
annotation	documentation Describes the simulated conditions under which the imagery channel is most valid.

element **RasterChannelType/Color**

diagram	
attributes	Name: ColorSpace — Type: **derived by: xsd:string** — Use: required Name: Name — Type: **xsd:string** — Use: required — documentation: Short description of this channel. For example: R, G, or B.
annotation	documentation This channel(s) is a known Tristimulus color model (RGB, XYZ, etc.).

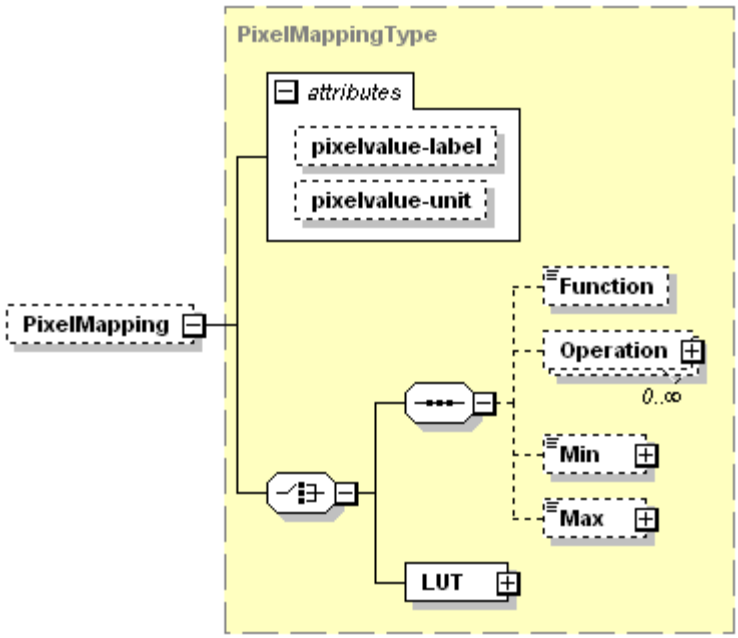
attribute **RasterChannelType/Color/@ColorSpace**

type	restriction of **xsd:string**
facets	Kind: enumeration — Value: RGB enumeration — Adobe RGB enumeration — Apple RGB enumeration — sRGB enumeration — HSV enumeration — HLS enumeration — XYZ enumeration — xyY enumeration — Lab enumeration — Luv enumeration — Luminance enumeration — Multi-spectral enumeration

attribute **RasterChannelType/Color/@Name**

type	**xsd:string**
annotation	documentation Short description of this channel. For example: R, G, or B.

element **RasterChannelType/Color/PixelMapping**

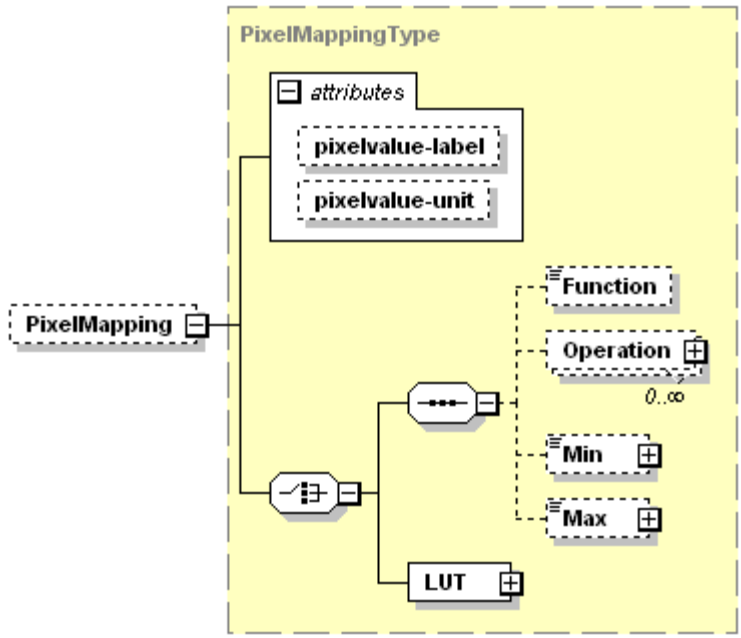
diagram	
type	**PixelMappingType**
attributes	Name / Type / Use / Default / Fixed / annotation pixelvalue-label **xsd:string** pixelvalue-unit **xsd:string**

element **RasterChannelType/Alpha**

diagram	
annotation	documentation Alpha channel is transparency mask mostly used for blending of overlapping images.

element **RasterChannelType/Alpha/PixelMapping**

diagram



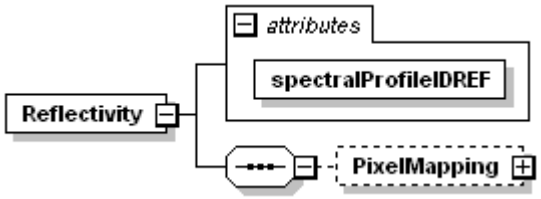
type **PixelMappingType**

attributes

Name	Type	Use	Default	Fixed	annotation
pixelvalue-label	**xsd:string**				
pixelvalue-unit	**xsd:string**				

element **RasterChannelType/Reflectivity**

diagram



attributes

Name	Type	Use	Default	Fixed	annotation
spectralProfileIDREF	**xsd:string**	required			documentation spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID element. It may refer to either illuminating source spectral distribution or sensor spectral response .

annotation

documentation

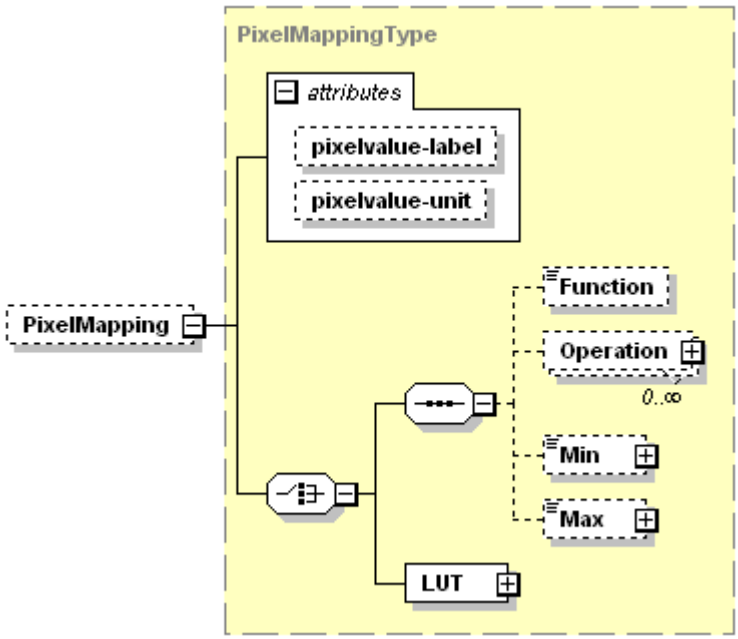
This channel is mapped to represent normalized scene reflectivity for given viewing and illuminating spectral responses. Reflectivity mosaics are processed from remote sensing products so that the digital numbers stored at each pixel location estimate the ground truth reflectivity of the terrain imaged at each pixel. The spectral profile detailing the relative response associated with each layer is contained within the NPSI metadata associated with that layer. Example spectral profiles included in the dataset include: photopic blue response , photopic green response, photopic red response, and NVG (Class B lens filter) response.

attribute **RasterChannelType/Reflectivity/@spectralProfileIDREF**

type	**xsd:string**
annotation	documentation spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID element. It may refer to either illuminating source spectral distribution or sensor spectral response .

element **RasterChannelType/Reflectivity/PixelMapping**

diagram



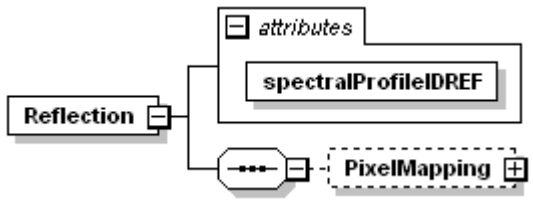
type **PixelMappingType**

attributes

Name	Type	Use	Default	Fixed	annotation
pixelvalue-label	**xsd:string**				
pixelvalue-unit	**xsd:string**				

element **RasterChannelType/Reflection**

diagram



attributes

Name	Type	Use	Default	Fixed	annotation
spectralProfileIDREF	**xsd:string**	required			documentation spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID element. It may refer to either illuminating source spectral distribution or sensor spectral response .

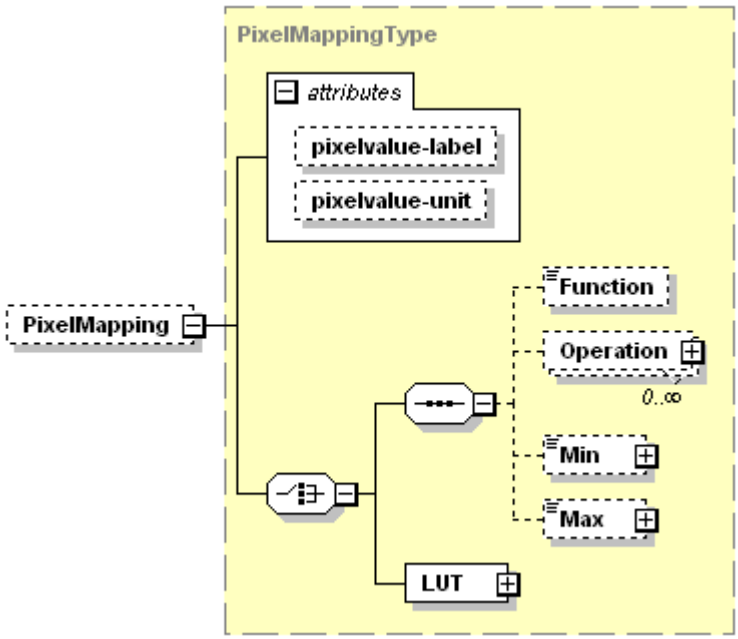
annotation documentation

	This channel is mapped to represent normalized reflected energy for given viewing and illuminating spectral responses.

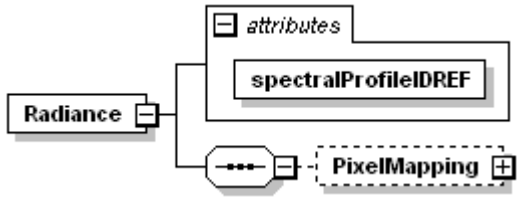
attribute **RasterChannelType/Reflection/@spectralProfileIDREF**

type	**xsd:string**
annotation	documentation spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID element. It may refer to either illuminating source spectral distribution or sensor spectral response .

element **RasterChannelType/Reflection/PixelMapping**

diagram	
type	**PixelMappingType**
attributes	Name: pixelvalue-label — Type: **xsd:string** Name: pixelvalue-unit — Type: **xsd:string**

element **RasterChannelType/Radiance**

diagram	
attributes	Name: spectralProfileIDREF — Type: **xsd:string** — Use: required annotation: documentation: spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID

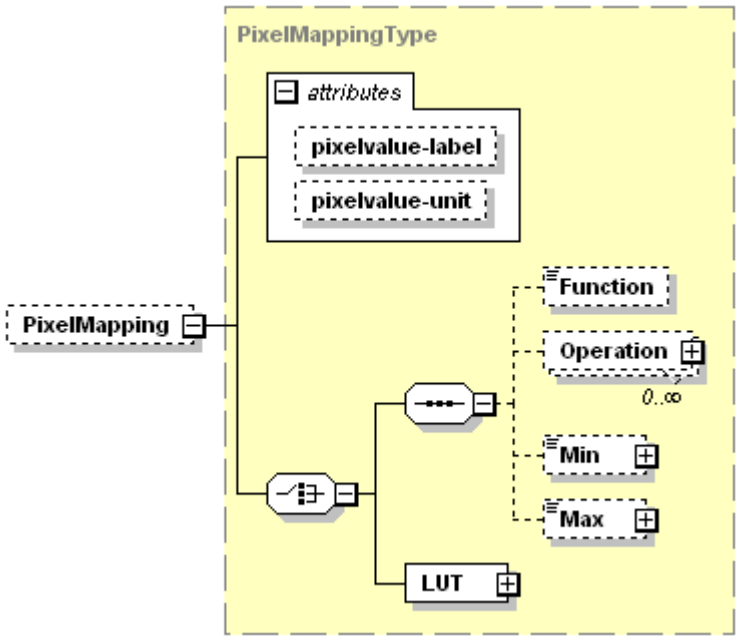
	element. It may refer to either illuminating source spectral distribution or sensor spectral response .
annotation	documentation This channel is mapped to represent actual integrated scene radiance per pixel in a given physical unit (e.g.w/cm2/sr) and a specified spectral response.

attribute **RasterChannelType/Radiance/@spectralProfileIDREF**

type	**xsd:string**
annotation	documentation spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID element. It may refer to either illuminating source spectral distribution or sensor spectral response .

element **RasterChannelType/Radiance/PixelMapping**

diagram



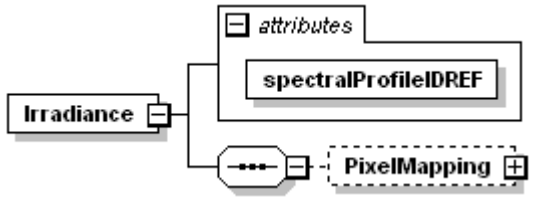
type **PixelMappingType**

attributes

Name	Type	Use	Default	Fixed	annotation
pixelvalue-label	**xsd:string**				
pixelvalue-unit	**xsd:string**				

element **RasterChannelType/Irradiance**

diagram



attributes

Name	Type	Use	Default	Fixed	annotation
spectralProfileIDREF	**xsd:string**	required			documentation

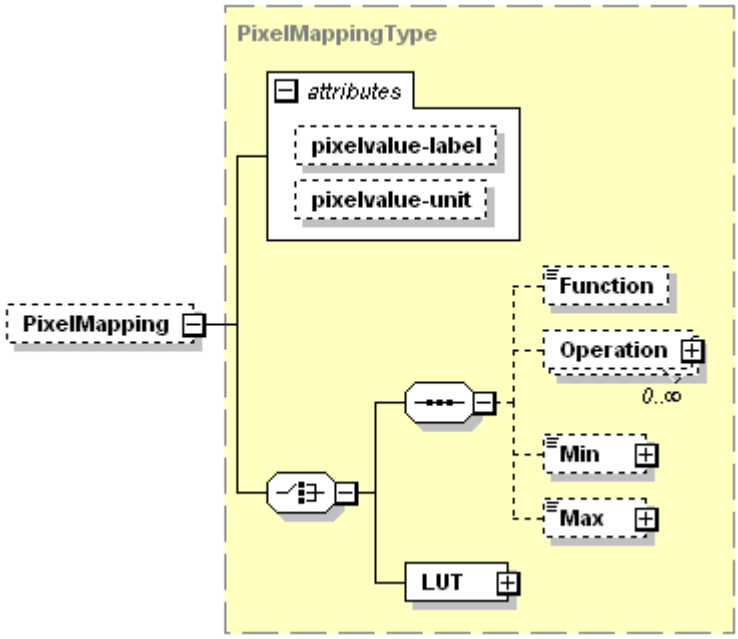
		spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID element. It may refer to either illuminating source spectral distribution or sensor spectral response .
annotation	documentation This channel is mapped to represent actual flux density per pixel in a given physical unit (e.g. w/cm2) for a given sensor spectral response. Irradiance mosaics are processed from remote sensing and GIS products so that the digital numbers stored at each pixel location estimate the radiant flux density (due to specified natural or cultural sources) incident to the terrain imaged at each pixel. The spectral profile detailing the relative response associated with each layer is contained within the NPSI metadata associated with that layer. Example spectral profiles included in the dataset include: photopic blue response , photopic green response, photopic red response, and NVG (Class B lens filter) response.	

attribute **RasterChannelType/Irradiance/@spectralProfileIDREF**

type	**xsd:string**
annotation	documentation spectralProfileIDREF is a reference to an ID defined in this XML document under the Dictionary\spectralProfileID element. It may refer to either illuminating source spectral distribution or sensor spectral response .

element **RasterChannelType/Irradiance/PixelMapping**

diagram

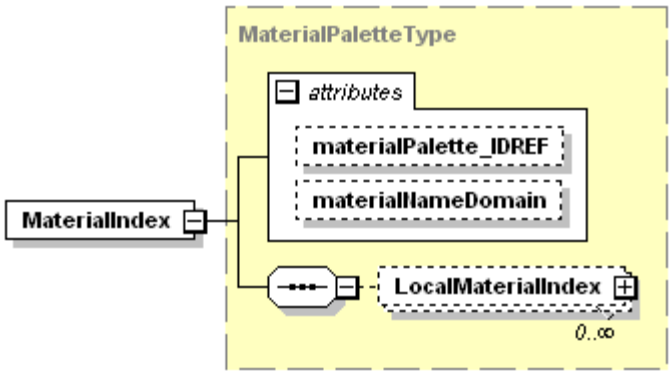


type **PixelMappingType**

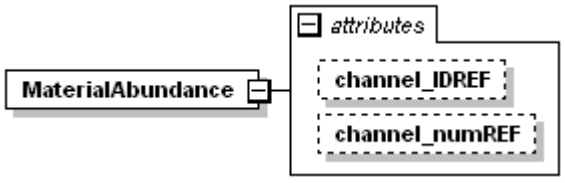
attributes

Name	Type	Use	Default	Fixed	annotation
pixelvalue-label	**xsd:string**				
pixelvalue-unit	**xsd:string**				

element **RasterChannelType/MaterialIndex**

diagram	
type	**MaterialPaletteType**
attributes	Name / Type / Use / Default / Fixed / annotation materialPalette_IDREF — **xsd:string** — documentation: If defined, references a material palette defined in the dictionary. Otherwise, material palette is defined locally. -- Changed to string type-- materialNameDomain — documentation: If standardized material name or ID is used, indicate the name domain or material library here. For example: MPRD, USGS, ASTER, etc.
annotation	documentation This channel is mapped to MPRD material indexes.

element **RasterChannelType/MaterialAbundance**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation channel_IDREF — **xsd:IDREF** — documentation: References the imagery channel containing the material IDs mixed by this

	channel_numREF	channel. Channel_ID is unique in an XML document. documentation References the imagery channel containing the material IDs mixed by this channel. Channel_num is NOT unique in an XML document.
annotation	documentation This channel is mapped to represent normalized percentages of abundance of materials encoded in a referenced imagery channel.	

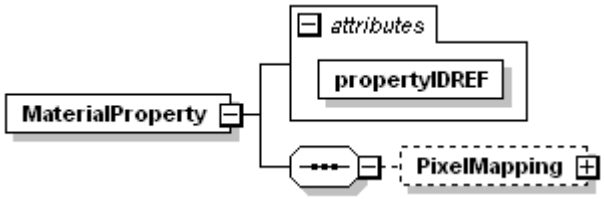
attribute **RasterChannelType/MaterialAbundance/@channel_IDREF**

type	**xsd:IDREF**
annotation	documentation References the imagery channel containing the material IDs mixed by this channel. Channel_ID is unique in an XML document.

attribute **RasterChannelType/MaterialAbundance/@channel_numREF**

annotation	documentation References the imagery channel containing the material IDs mixed by this channel. Channel_num is NOT unique in an XML document.

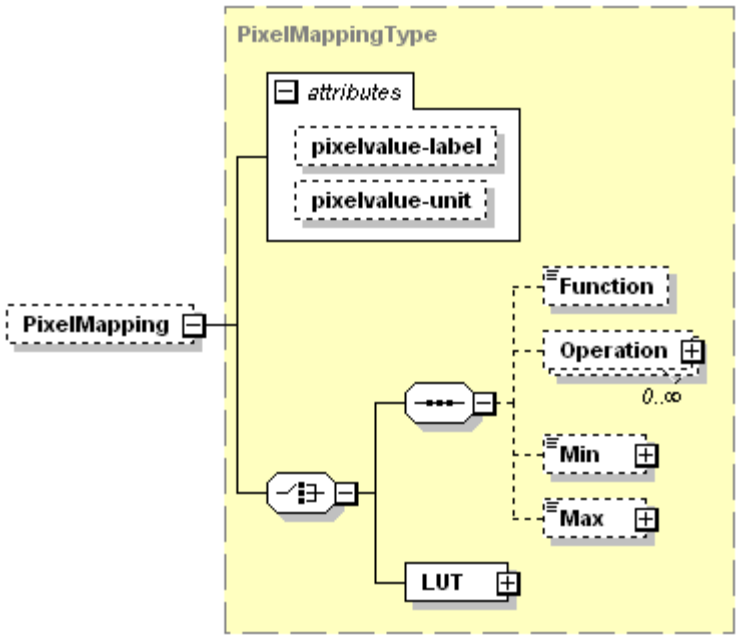
element **RasterChannelType/MaterialProperty**

diagram						
attributes	Name	Type	Use	Default	Fixed	annotation
	propertyIDREF	**xsd:string**	required			
annotation	documentation This channel is mapped to represent values of a physical measure for the material depicted at each pixel.					

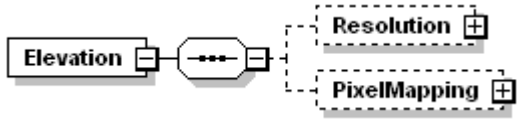
attribute **RasterChannelType/MaterialProperty/@propertyIDREF**

type	**xsd:string**

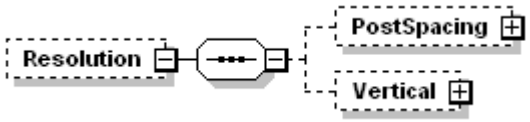
element **RasterChannelType/MaterialProperty/PixelMapping**

diagram	
type	**PixelMappingType**
attributes	Name / Type / Use / Default / Fixed / annotation pixelvalue-label **xsd:string** pixelvalue-unit **xsd:string**

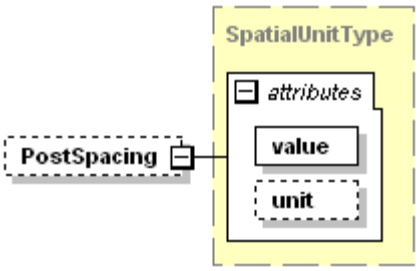
element **RasterChannelType/Elevation**

diagram	
annotation	documentation This channel is mapped to represent elevation. Digital elevation model (DEM) mosaics are processed from remote sensing products so that the digital numbers stored at each pixel location estimate the altitude (above sea level) of the terrain imaged at each pixel. A positive number indicates above sea-level, and a negative number under sea-level.

element **RasterChannelType/Elevation/Resolution**

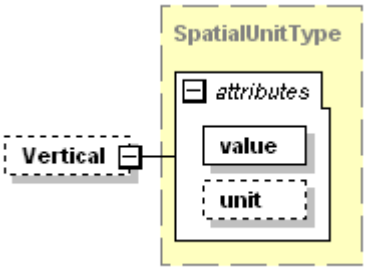
diagram	

element **RasterChannelType/Elevation/Resolution/PostSpacing**

diagram	
type	**SpatialUnitType**

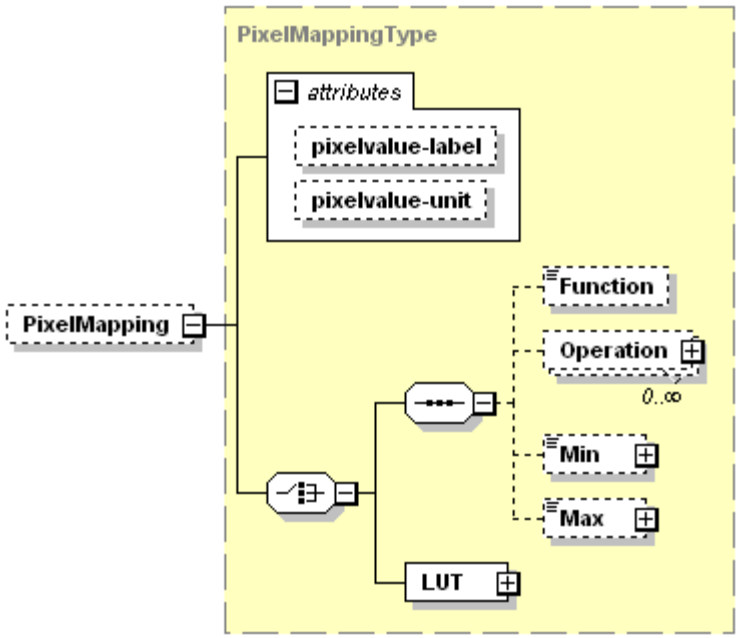
attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				

element **RasterChannelType/Elevation/Resolution/Vertical**

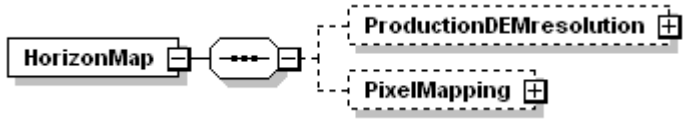
diagram	
type	**SpatialUnitType**

attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				

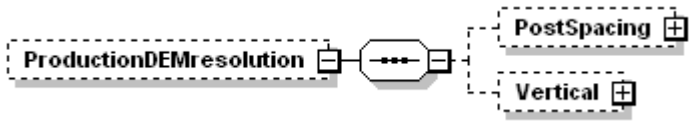
element **RasterChannelType/Elevation/PixelMapping**

diagram	
type	**PixelMappingType**
attributes	Name / Type / Use / Default / Fixed / annotation pixelvalue-label **xsd:string** pixelvalue-unit **xsd:string**

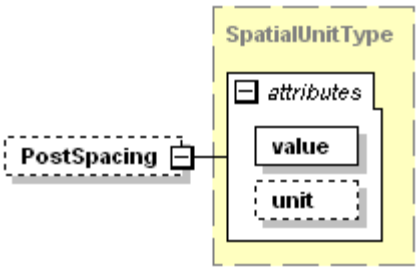
element **RasterChannelType/HorizonMap**

diagram	
annotation	documentation This channel is mapped to represent horizon angles at a single azimuth for each pixel location. Horizon Map mosaics are processed from remote sensing and GIS products so that the digital numbers stored at each pixel location estimate the horizon angle computed for a specified azimuth relative to the terrain imaged at each pixel. In application, these data facilitate real-time shadows on modern rendering architectures. The parameters required for shadow rendering from each layer is contained within the NPSI metadata associated with that layer.

element **RasterChannelType/HorizonMap/ProductionDEMresolution**

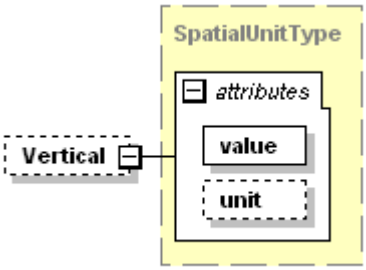
diagram	
annotation	documentation Precision of the DEM that was used to compute the horizon angles present in this horizon map.

element **RasterChannelType/HorizonMap/ProductionDEMresolution/PostSpacing**

diagram	
type	**SpatialUnitType**

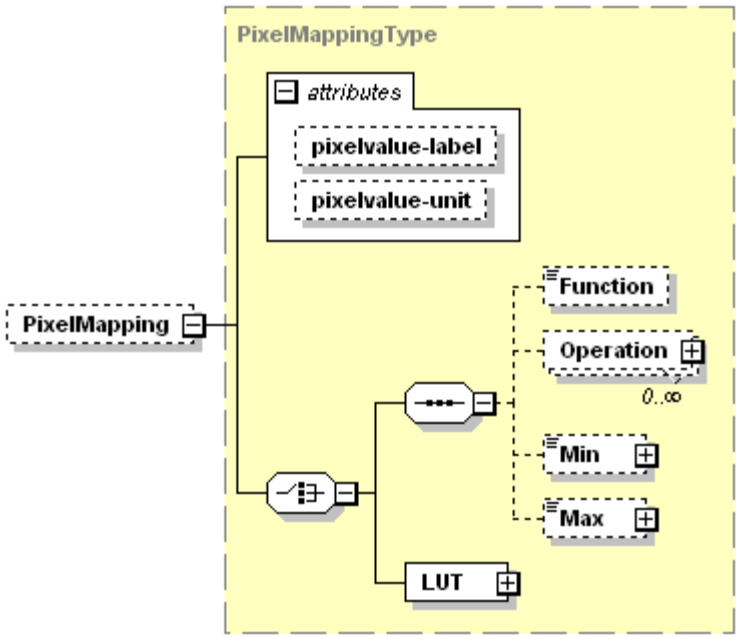
attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				

element **RasterChannelType/HorizonMap/ProductionDEMresolution/Vertical**

diagram	
type	**SpatialUnitType**

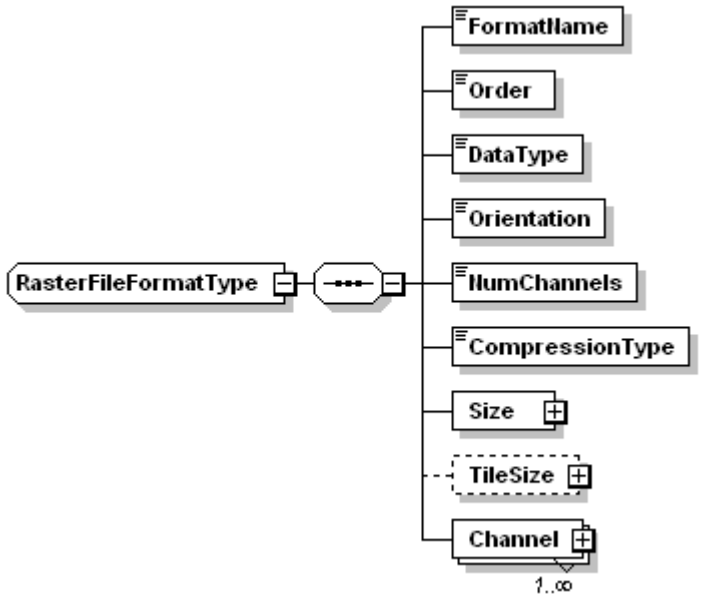
attributes	Name	Type	Use	Default	Fixed	annotation
	value	**xsd:double**	required			
	unit	**derived by: xsd:string**				

element **RasterChannelType/HorizonMap/PixelMapping**

diagram	
type	**PixelMappingType**
attributes	Name / Type / Use / Default / Fixed / annotation pixelvalue-label **xsd:string** pixelvalue-unit **xsd:string**

A.5.28 RasterFileFormatType

complexType **RasterFileFormatType**

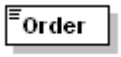
diagram	

used by	elements **GenericRasterFileType/RasterFileFormat** **TextureFeatureType/RasterFileFormat**
annotation	documentation Complex-type: template digital mechanism used to represent spatial information for raster files.

element **RasterFileFormatType/FormatName**

diagram	
type	**xsd:string**
annotation	documentation Name of the data format, for example, TIFF, DTED, RPF.

element **RasterFileFormatType/Order**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration BIL enumeration BSQ enumeration BIP
annotation	documentation Binary data storage types; Band sequential (BSQ); Band interleaved by line (BIL); Band interleaved by pixel (BIP).

element **RasterFileFormatType/DataType**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration 11-BIT enumeration 8-BIT_SIGNED enumeration 8-BIT_UNSIGNED enumeration 16-BIT_SIGNED enumeration 16-BIT_UNSIGNED enumeration BYTE enumeration INTEGER enumeration LONG INTEGER enumeration UNSIGNED LONG enumeration FLOATING POINT enumeration DOUBLE PRECISION enumeration 64-BIT_INTEGER enumeration 64-BIT_UNSIGNED enumeration COMPLEX enumeration DOUBLE COMPLEX
annotation	documentation Data word type.

element **RasterFileFormatType/Orientation**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration UPPER_LEFT enumeration UPPER_RIGHT enumeration LOWER_LEFT enumeration LOWER_RIGHT
annotation	documentation Reference point location.

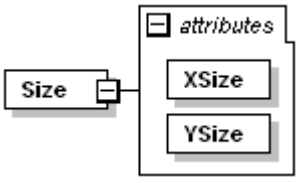
element **RasterFileFormatType/NumChannels**

diagram	
type	**xsd:int**
annotation	documentation Number of channel layers.

element **RasterFileFormatType/CompressionType**

diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration LZW enumeration RLE enumeration PNG enumeration JPEG enumeration NONE
annotation	documentation File compression type.

element **RasterFileFormatType/Size**

diagram	
attributes	Name / Type / Use / Default / Fixed / annotation XSize **xsd:positiveInteger** required — documentation: Column pixels count. YSize **xsd:positiveInteger** required — documentation: Row pixels. count

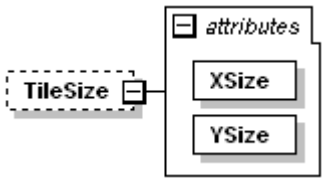
attribute **RasterFileFormatType/Size/@XSize**

type	**xsd:positiveInteger**
annotation	documentation Column pixels count.

attribute **RasterFileFormatType/Size/@YSize**

type	**xsd:positiveInteger**
annotation	documentation Row pixels count.

element **RasterFileFormatType/TileSize**

diagram	

attributes

Name	Type	Use	Default	Fixed	annotation
XSize	**xsd:positiveInteger**	required			
YSize	**xsd:positiveInteger**	required			

attribute **RasterFileFormatType/TileSize/@XSize**

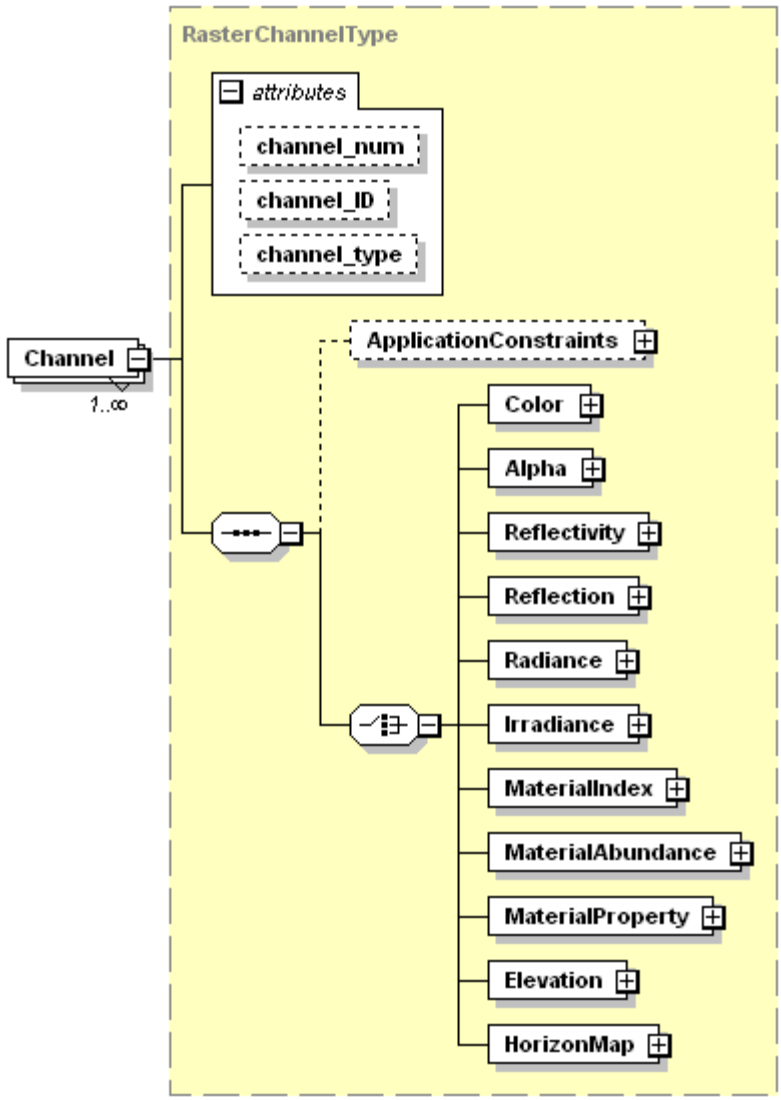
type	**xsd:positiveInteger**

attribute **RasterFileFormatType/TileSize/@YSize**

type	**xsd:positiveInteger**

element **RasterFileFormatType/Channel**

diagram



type **RasterChannelType**

attributes

Name	Type	Use	Default	Fixed	annotation
channel_num	**derived by: xsd:string**				
channel_ID	**xsd:ID**				documentation Channel_ID is a unique ID in a XML document. This is an optional attribute; used when it is necessary to reference this channel from another raster file.
channel_type	**derived by: xsd:string**				

annotation

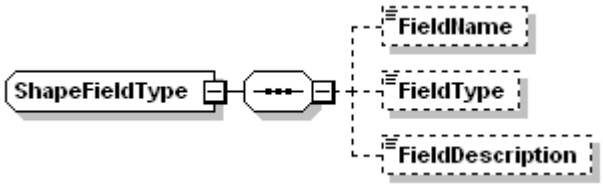
documentation

Raster data channel type and definition. A raster file may contain n number of channels or layers. The channels

	may be of all the same type or a mix of various types.

A.5.29 ShapeFieldType

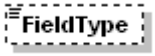
complexType **ShapeFieldType**

diagram	
used by	element **VectorFileFormatType/ShapeField**
annotation	documentation Complex-type: fields within the vector feature file attribute table.

element **ShapeFieldType/FieldName**

diagram	
type	**xsd:string**
annotation	documentation Name of field.

element **ShapeFieldType/FieldType**

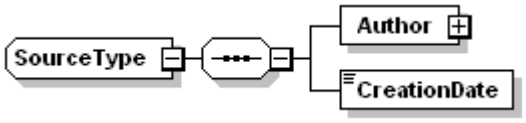
diagram	
type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration String enumeration Float enumeration Integer enumeration Number enumeration OID enumeration Geometry
annotation	documentation Type of data within the field.

element **ShapeFieldType/FieldDescription**

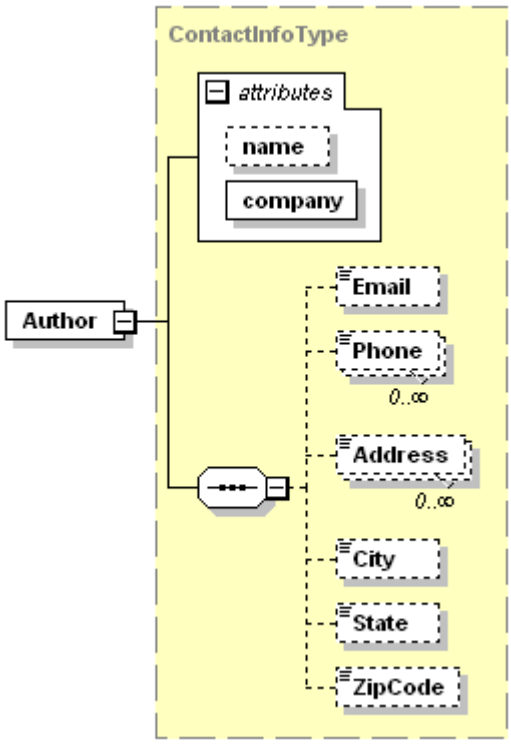
diagram	
annotation	documentation Description of intended use of the field data, i.e feature code, orientation, height, etc.

A.5.30 SourceType

complexType **SourceType**

diagram	
used by	element **FileRefType/Source**
annotation	documentation Complex-type: identification of the data file author and creation date.

element **SourceType/Author**

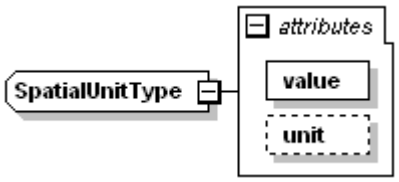
diagram	
type	**ContactInfoType**
attributes	Name / Type / Use / Default / Fixed / annotation name — **xsd:string** company — **xsd:string** — required
annotation	documentation Author or vendor's contact information.

element **SourceType/CreationDate**

diagram	
type	**xsd:date**
annotation	documentation File creation date.

A.5.31 SpatialUnitType

complexType **SpatialUnitType**

diagram	
used by	elements GeoreferenceType/SpatialReference/Geographic/LatitudeResolution GeoreferenceType/SpatialReference/Geographic/LongitudeResolution RasterChannelType/Elevation/Resolution/PostSpacing RasterChannelType/HorizonMap/ProductionDEMresolution/PostSpacing GenericRasterFileType/TargetResolution TextureFeatureType/TargetResolution RasterChannelType/Elevation/Resolution/Vertical RasterChannelType/HorizonMap/ProductionDEMresolution/Vertical PerspectiveGeoreferenceType/Reference/XCoordinate PerspectiveGeoreferenceType/ViewPoint/XCoordinate GeoreferenceType/SpatialReference/Planar/XResolution PerspectiveGeoreferenceType/Reference/YCoordinate PerspectiveGeoreferenceType/ViewPoint/YCoordinate GeoreferenceType/SpatialReference/Planar/YResolution PerspectiveGeoreferenceType/Reference/ZCoordinate PerspectiveGeoreferenceType/ViewPoint/ZCoordinate
attributes	Name: value — Type: **xsd:double** — Use: required Name: unit — Type: **derived by: xsd:string**
annotation	documentation Complex-type: per-pixel size in spatial unit.

attribute **SpatialUnitType/@value**

type	**xsd:double**

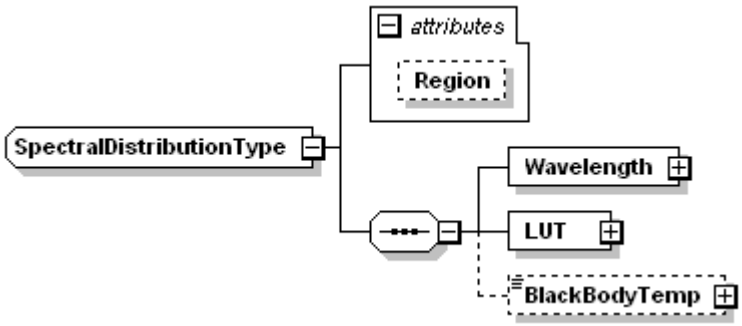
attribute **SpatialUnitType/@unit**

type	restriction of **xsd:string**
facets	Kind: enumeration — Value: KILOMETERS enumeration — METERS enumeration — CENTIMETERS enumeration — MILES enumeration — FEET enumeration — INCHES

	enumeration	DEGREES_LATLON
	enumeration	ARCSEC
	enumeration	ARCMIN
	enumeration	ARCDEG

A.5.32 SpectralDistributionType

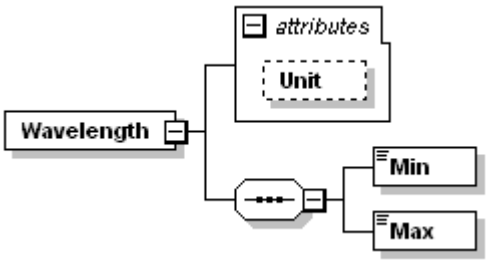
complexType **SpectralDistributionType**

diagram	
used by	element **DictionaryType/SpectralProfile/SpectralDistribution**
attributes	Name: Region; Type: **derived by: xsd:string**; Use; Default; Fixed; annotation
annotation	documentation Complex-type: defines a spectral distribution.

attribute **SpectralDistributionType/@Region**

type	restriction of **xsd:string**		
facets	Kind	Value	annotation
	enumeration	UV	
	enumeration	Visible	
	enumeration	NIR	
	enumeration	IR	
	enumeration	RED	
	enumeration	GREEN	
	enumeration	BLUE	

element **SpectralDistributionType/Wavelength**

diagram	

attributes	Name	Type	Use	Default	Fixed	annotation
	Unit	**derived by: xsd:string**				

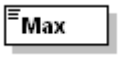
attribute **SpectralDistributionType/Wavelength/@Unit**

type	restriction of **xsd:string**
facets	Kind: enumeration, Value: nm enumeration, um

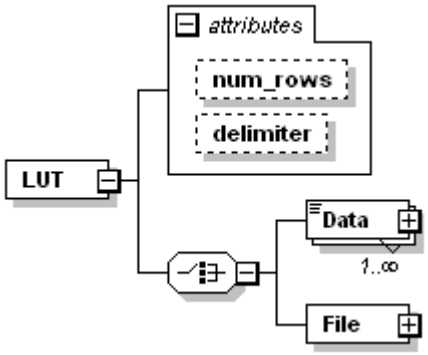
element **SpectralDistributionType/Wavelength/Min**

diagram	
type	**xsd:decimal**

element **SpectralDistributionType/Wavelength/Max**

diagram	
type	**xsd:decimal**

element **SpectralDistributionType/LUT**

diagram	
attributes	Name: num_rows — Type: **xsd:integer** Name: delimiter — Type: **derived by: xsd:string**
annotation	documentation Look-up Table data in the format of paired X,Y, where X=wavelength and Y=normalized response between 0 to 1.0.

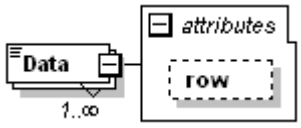
attribute **SpectralDistributionType/LUT/@num_rows**

type	**xsd:integer**

attribute **SpectralDistributionType/LUT/@delimiter**

type	restriction of **xsd:string**
facets	Kind / Value / annotation enumeration , enumeration /s enumeration /t enumeration ;

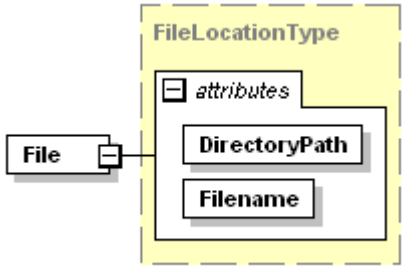
element **SpectralDistributionType/LUT/Data**

diagram	
type	extension of **xsd:string**
attributes	Name / Type / Use / Default / Fixed / annotation row **xsd:integer** optional

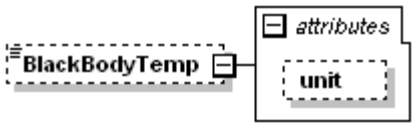
attribute **SpectralDistributionType/LUT/Data/@row**

type	**xsd:integer**

element **SpectralDistributionType/LUT/File**

diagram	
type	**FileLocationType**
attributes	Name / Type / Use / Default / Fixed / annotation DirectoryPath **xsd:string** required — documentation: Path to the file location. This path is relative to the location of this XML file. Filename **xsd:string** required — documentation: Filename with extension.

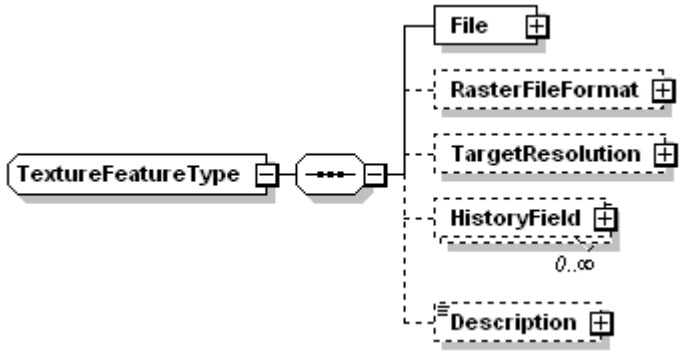
element **SpectralDistributionType/BlackBodyTemp**

diagram	
type	extension of **xsd:decimal**
attributes	Name Type Use Default Fixed annotation unit

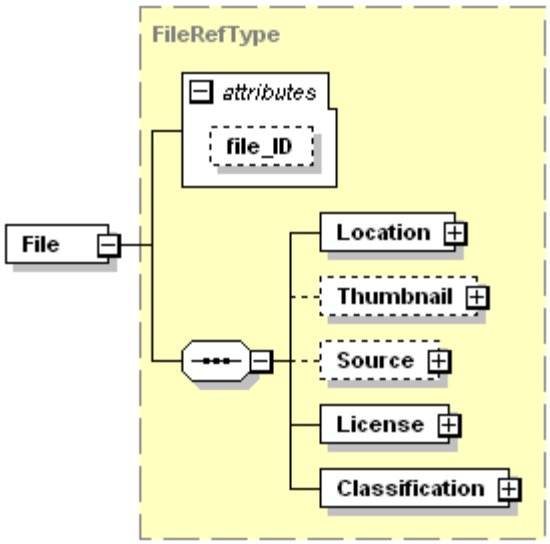
attribute **SpectralDistributionType/BlackBodyTemp/@unit**

A.5.33 TextureFeatureType

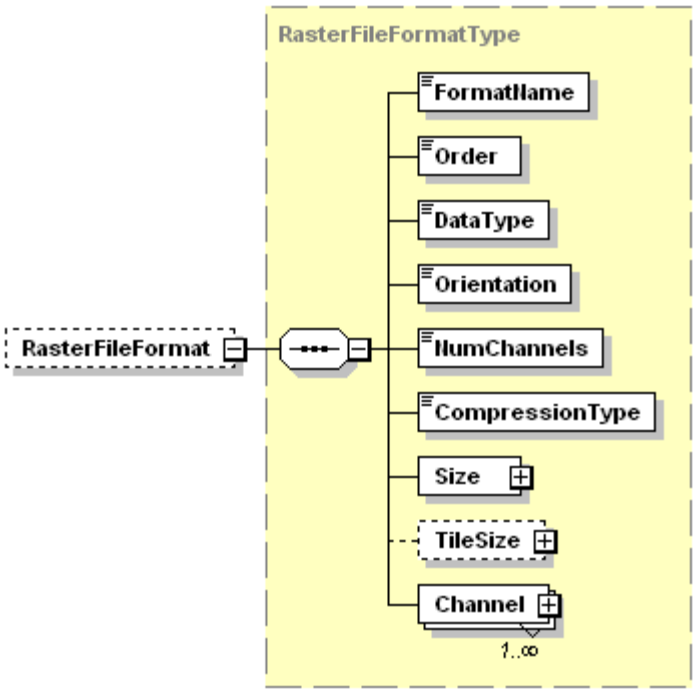
complexType **TextureFeatureType**

diagram	
used by	elements **ModelFeatureType/Textures/Texture** **NPSIBase/NPSIDataset/CulturalFeatureData/TextureFeature**
annotation	documentation Complex-type: template texture raster file.

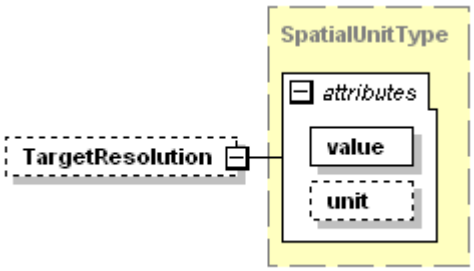
element **TextureFeatureType/File**

diagram	
type	**FileRefType**
attributes	Name: file_ID; Type: **xsd:ID**; Use: ; Default: ; Fixed: ; annotation: documentation: File ID is required only if this file is being referenced within this document.
annotation	documentation: File identification information.

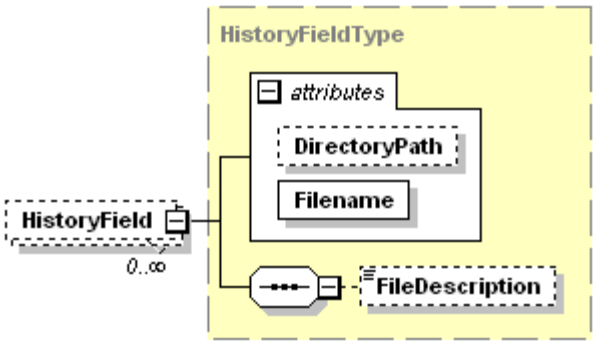
element **TextureFeatureType/RasterFileFormat**

diagram	
type	RasterFileFormatType
annotation	documentation Template digital mechanism used to represent spatial information for raster files.

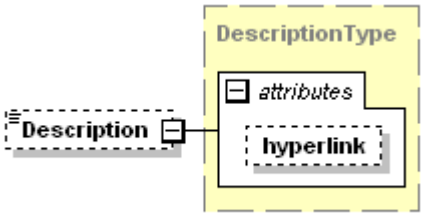
element **TextureFeatureType/TargetResolution**

diagram	
type	SpatialUnitType
attributes	Name: value — Type: xsd:double — Use: required Name: unit — Type: derived by: xsd:string — Use: — Default: — Fixed: — annotation:
annotation	documentation Intended resolution for runtime application.

element **TextureFeatureType/HistoryField**

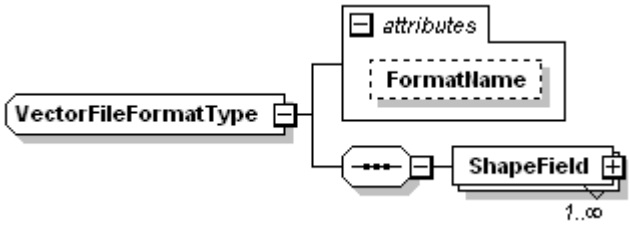
diagram	
type	**HistoryFieldType**
attributes	Name / Type / Use / Default / Fixed / annotation DirectoryPath — **xsd:string** — optional — documentation: Path to the file location. This could be URL, relative, or absolute path. Filename — **xsd:string** — required — documentation: Filename with extension.
annotation	documentation List of fields within the vector feature file attribute table.

element **TextureFeatureType/Description**

diagram	
type	**DescriptionType**
attributes	Name / Type / Use / Default / Fixed / annotation hyperlink — **xsd:string**
annotation	documentation Description of this raster data. The text for this description may be referenced in the hyperlink attribute.

A.5.34 VectorFileFormatType

complexType **VectorFileFormatType**

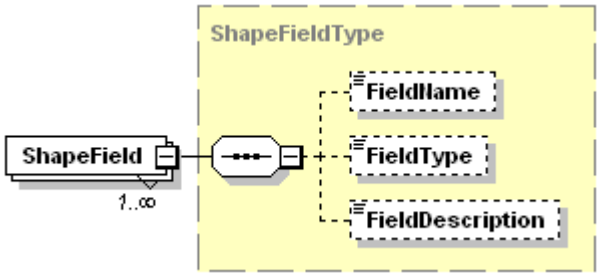
diagram	

used by	element **GenericVectorType/VectorFileFormat**
attributes	Name: FormatName; Type: **derived by: xsd:string**; Use: ; Default: ; Fixed: ; annotation: documentation: Vector feature file type (currently restricted to ESRI shapefile).
annotation	documentation: Complex-type: vector feature file format.

attribute **VectorFileFormatType/@FormatName**

type	restriction of **xsd:string**
facets	Kind: enumeration; Value: Shapefile; annotation:
annotation	documentation: Vector feature file type (currently restricted to ESRI shapefile).

element **VectorFileFormatType/ShapeField**

diagram	
type	**ShapeFieldType**
annotation	documentation: List of fields within the vector feature file attribute table.