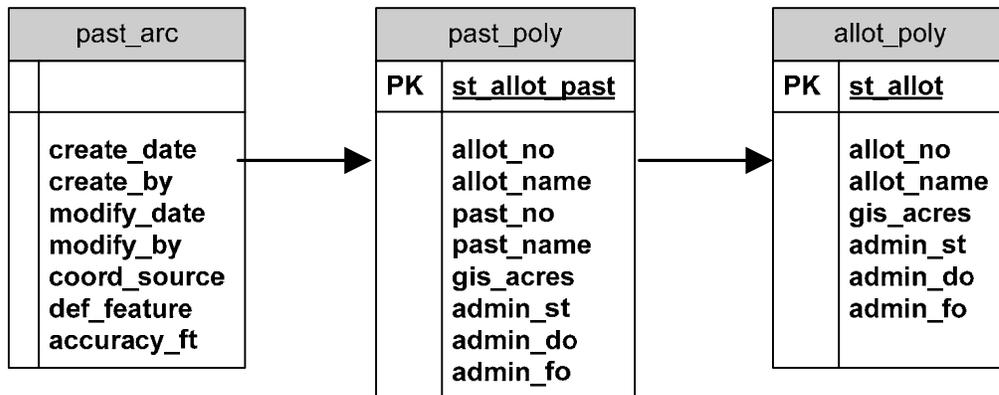


## Attachment 1 Geospatial Data Model for Pasture and Allotment Polygons

This document describes the logical model for the Pasture geospatial dataset. The Allotment information will exist within the Pastures dataset and as such the Allotments spatial dataset will be a derived product from Pasture.

The proposed data model for the National geospatial dataset of Allotment\_Pasture is described below. The model is actually a simple model because the data is to be stored as arcs and polygons reflecting the technology of the ESRI Geodatabase. The attribute data that it will need is minimal as the majority of the analysis information will come from the RAS database. The item listed as the Primary Key in the 'past\_poly' table will serve as the unique national identifier that will allow connection to the existing RAS database.

There are three tables (features) shown in this group. The first represents the arc features that will make up the polygons. These arcs will have the feature level metadata attributes shown assigned to them. The second and third tables show the polygon features that will actually represent the pastures and allotments. Since the data in the RAS system is about allotments and pastures where they are used, this is where the data connection between the geospatial feature data and the RAS application will be established.



### A. Pasture Arcs (past\_arc)

The arc features used to define the polygon features are described below. These arc attributes serve as feature level metadata information. Some of these items will be system generated and will not require any input effort by the users. The others have Domain values with appropriate definitions. The last three attributes fully describe the data collection method along with a description of the expected spatial accuracy. The last three attributes have intentionally been separated out to remove having any 'complex' or 'smart' attributes that carry more than a single piece of information.

ATTRIBUTE NAME	GIS NAME	DATA DEFINITION	REQUIREMENT
CREATED DATE	create_date	Datetime	Feature level metadata. Required. Generated.
CREATED BY NAME	create_by	Varchar(30)	Feature level metadata. Required. Generated.
MODIFIED DATE	modify_date	Datetime	Feature level metadata. Required. Generated.
MODIFIED BY NAME	modify_by	Varchar(30)	Feature level metadata. Required. Generated.
COORDINATE SOURCE CODE	coord_source	Varchar(5)	Feature level metadata. Required.
DEFINING FEATURE CODE	def_feature	Varchar(15)	Feature level metadata. Required.
ACCURACY MEASUREMENT IN FEET	accuracy_ft	Small Integer(4)	Feature level metadata. Required
OPTIONAL			Optional Items for each state must come after required items

#### 1. Created Date

This is a system generated attribute. As a new feature is added to the system its creation date will be collected and maintained. The date will be in FGDC standard format of YYYYMMDD.

#### 2. Created By

This is a system generated attribute. As a new feature is added to the system the userid of the person creating the feature will be collected and maintained. The userid will be the persons BLM login id.

#### 3. Modified Date

This is a system generated attribute. As a feature is edited or modified while in the system its modification date will be collected and maintained. The date will be in FGDC standard format of YYYYMMDD.

#### 4. Modified By

This is a system generated attribute. As a feature is edited or modified while in the system userid of the person modifying the data will be collected and maintained. The userid will be the persons BLM login id.

## 5. Coordinate Source Code

The Coordinate Source Code represents a compilation of state adopted source codes. This table contains those codes that would most likely be used in the determination of source codes for the Pastures dataset. This list may seem incomplete to many as the previous lists were often a combination of information that attempted to define both source and some inferred measure of accuracy. For example there were formerly multiple 'GPS' and DLG sources with their expected spatial accuracy. Those accuracies have been moved to the 'Accuracy Measurement table.

Attribute Domain Assignment: dom\_past\_coord\_source

Default value: UNK

Allowable Codes:

coord_source	Definition
MAP	Manuscripted lines. Includes hand drawing onto paper or mylar map base and capturing with a digitizing tablet and on-screen digitizing using DRG
IMG	DOQ or other imagery backdrops at any scale
GPS	Lines obtained from a Global Positioning System device not using survey methods.
DLG	Lines duplicated or buffered from (1:24K or 1:100K scale) USGS Digital Line Graph derived data including GIS themes such as BLM Streams or transportation.
CFF	Lines duplicated or buffered from Cartographic Feature Files (USFS).
GCD	Lines snapped to Geographic Coordinate Database points.
DEM	Digital Elevation Model (30m or better accuracy) used for creation of contours.
NHD	USGS National Hydrologic Dataset (NHD) 1:24K or 1:100K
SRV	Survey methods were used to define the line feature. This normally requires using COGO or Survey Manager to input the data.
UNK	Unknown source (default value)

## 6. Defining Feature Description

The following table defines the feature types from which the arcs are derived to create the allotment\_pasture polygon boundaries. This information describes the physical or mapping feature that makes up the pasture boundary.

Attribute Domain Assignment: dom\_past\_def\_feature

Default value: UNK

Allowable Codes:

def_feature	Definition
RIM	Natural topographic barrier to the movement of livestock
FENCE	Constructed fence
LAKE	The shoreline of any manmade or natural standing water
ROUTE	Road centerlines (Using the name of the FAMS Feature Class)
STREAM_RBANK	Downstream right bank of stream, manmade or natural moving water (indicates that the stream is within the downstream left pasture)
STREAM_LBANK	Downstream left bank of stream, manmade or natural moving water (indicates that the stream is within the downstream right pasture)
STREAM_CENTER	Centerline of stream, manmade or natural moving water
PARCEL	Legal line such as ownership or section line
PT-TO-PT	Boundary is not a legal or geographic feature
ROUTE_OFFSET	Boundary is offset from a route
UNK	Defining feature unknown

## 7. Accuracy Measurement

The Accuracy Measurement defines how close, in feet, the actual ground location is to the spatial depiction in GIS. This value would typically be determined by the map accuracy value if a USGS map were used to define the boundary, or by the expected spatial accuracy achieved through the use of GPS. The value may also be the result of a measurement of that accuracy as is noted in the The National Standard for Spatial Data Accuracy (NSSDA)<sup>1</sup> which is a “data usability” standard issued by the Federal Geographic Data Committee (FGDC).

A value of -1 indicates that the accuracy is unknown; or that no reliable estimate can be made. An example of a feature that has an accuracy of +/- 40 feet would have an entry of ‘40’.

<sup>1</sup> Federal Geographic Data Committee. 1998. Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy, FGDC-STD-007.3-1998

Attribute Domain Assignment: none

Default value: ‘-1’

Small Integer, Required field

### B. Pasture Polygons (past\_poly)

The pasture polygon features are defined below. These pasture attributes may be duplicated in RAS but are considered minimum information for unique identification and cartographic purposes. Domain values are used when appropriate.

There will be a minimum of 9 attributes associated with the polygon features.

ATTRIBUTE NAME	GIS NAME	DATA DEFINITION	REQUIREMENT
ALLOTMENT NUMBER	<a href="#">allot_no</a>	5 characters	Required
ALLOTMENT NAME	<a href="#">allot_name</a>	50 characters	Required
PASTURE NUMBER	<a href="#">past_no</a>	2 characters	Required
PASTURE NAME	<a href="#">past_name</a>	50 characters	Required
GIS ACRES	<a href="#">gis_acres</a>	Numeric 16.6	Required
ADMINISTRATIVE STATE CODE	<a href="#">admin_st</a>	2 characters	Required
ADMINISTRATIVE DISTRICT OFFICE CODE	<a href="#">admin_do</a>	2 characters	Required
ADMINISTRATIVE FIELD OFFICE CODE	<a href="#">admin_fo</a>	3 characters	Required
ADMINISTRATIVE STATE ALLOTMENT PASTURE NUMBER	<a href="#">st_allot_past</a>	7 characters	Required
OPTIONAL			Optional Items for each state must come after required items

## 1. Allotment Number

The allotment number is a five-digit number that is unique within the BLM administrative state. An allotment number may never be reused. If an existing allotment is divided or combined, all changed allotments should be assigned a new allotment number.

New allotment numbers are normally assigned by the system; however users may assign unique unused numbers according to office policy. Once an allotment has been created, any office can attach authorization(s) to it. Only the office creating the allotment is allowed to modify the allotment.

The leading zeros must be included in the values entered in this field. '00045' is the correct entry, not '45'.

## 2. Allotment Name

The name given to the allotment, defined as "...an area of land designated and managed for grazing of livestock." It may include private, state, and public lands under the jurisdiction of the Bureau of Land Management and/or other federal agencies.

### 3. Pasture Number

The pasture number is a two-digit number that is unique within an allotment if there is more than one pasture within the allotment. The default value for a Pasture Number is “01” if there is only one pasture within the allotment. This in effect means that the pasture is the allotment. All additional pastures shall be numbered sequentially from “01”.

### 4. Pasture Name

A pasture name is given to an area that is a subset area of an allotment. Some allotments may have multiple pastures where a name would be appropriate while some allotments may have no pastures delineated in which case the default value should be ‘NA’.

### 5. GIS Acres

This is a calculated value of area in units of acres based on the area field created by default within the ESRI Polygon data structure. For the purposes of a ‘national data layer’, the data are to be stored in geographic coordinates which do not correspond to ground values. This requires that there be a standard method for calculating this attribute.

The method used for this data is as follows. The data are projected into a standard projection such as the ESRI default Albers projection for the continental United States. “US Albers NAD 1983” Once the data are projected, then a calculation of “SHAPE\_Area (square meters) \* 0.0002471044 = acres” is applied to the existing ‘area’ field that is default area created by the ESRI software resulting in the field (Attribute) ‘SHAPE\_Area’. Please note that the figure used in this calculation is the factor for converting the US Survey Foot value of for the length of a meter as opposed to the International Standard for converting meters and feet.

A tool will be developed to ensure there is a consistent transformation of geographic coordinates to projected coordinates and an acreage calculation. A standard conversion constant will be used to ensure consistent acreage computations. The tool and all supporting information are contained in Appendix A of this document.

The following three codes are part of a three tier identification system. While some states may not use the exact naming convention, using the listing as a three tier code will allow for the creation of a unique identifier that is listed as the last required attribute. In addition there are numerous groups within BLM currently using this type of a system and while it will soon be replaced by a new code system from FBMS, this will allow the codes to be linked and migrated to match the new BLM/DOI standards.

#### 6. Administrative State Code

This is a two digit state code. The two letter Postal code is the correct value for this attribute.

#### 7. Administrative District Office Code

This is a two digit code designating the second administrative layer down from a state office.

#### 8. Administrative Field Office Code

This is a three digit code designating the third administrative layer down from a state office.

#### 9. Administrative State Allotment Pasture Number

This is a concatenation of three existing attributes but is not a substitute for having any of those three attributes. It is the existing unique code that identifies individual allotments throughout the entire United States. This concatenated value serves as a nationwide unique identifier that allows for a linkage from any unique Pasture polygon in the Geospatial dataset to the RAS dataset.

#### C. Allotment Polygons (allot\_poly)

The Allotment polygon features are derived features from the Pasture Polygons. These attributes are allotment attributes that may be duplicated in RAS but are considered to be minimum information for unique identification and cartographic purposes. Domain values lists are utilized with their appropriate definitions

**Attachment 1-7**

There will be a minimum of 7 attributes associated with the allotment polygon features.

ATTRIBUTE NAME	GIS NAME	DATA DEFINITION	REQUIREMENT
ALLOTMENT NUMBER	<a href="#">allot_no</a>	5 characters	Required
ALLOTMENT NAME	<a href="#">allot_name</a>	50 characters	Required
GIS ACRES	gis_acres	Numeric 16.6	Required
ADMINISTRATIVE STATE CODE	<a href="#">admin_st</a>	2 characters	Required
ADMINISTRATIVE DISTRICT OFFICE CODE	admin_do	2 characters	Required
ADMINISTRATIVE FIELD OFFICE CODE	<a href="#">admin_fo</a>	3 characters	Required
ADMINISTRATIVE STATE ALLOTMENT NUMBER	st_allot	7 characters	Required
OPTIONAL			Optional Items for each state must come after required items

### 1. Allotment Number

The allotment number is a five-digit number that is unique within the BLM administrative state. An allotment number may never be reused. If an existing allotment is divided or combined, all changed allotments should be assigned a new allotment number.

New allotment numbers are normally assigned by the system; however users may assign unique unused numbers according to office policy. Once an allotment has been created, any office can attach authorization(s) to it. Only the office creating the allotment is allowed to modify the allotment.

The leading zeros must be included in the values entered in this field. '00045' is the correct entry, not '45'.

### 2. Allotment Name

The name given to the allotment, defined as "...an area of land designated and managed for grazing of livestock." It may include private, state, and public lands under the jurisdiction of the Bureau of Land Management and/or other federal agencies.

### 3. GIS Acres

This is a calculated value of area in units of acres based on the area field created by default within the ESRI Polygon data structure. For the purposes of a 'national data layer', the data are to be stored in geographic coordinates which do not correspond to ground values. This requires that there be a standard method for calculating this attribute.

The method used for this data is as follows. The data are projected into a standard projection such as the ESRI default Albers projection for the continental United States. "US Albers NAD 1983" Once the data are projected, then a calculation of "SHAPE\_Area (square meters) \* 0.0002471044 = acres" is applied to the existing 'area' field that is default area created by the ESRI software resulting in the field (Attribute) 'SHAPE\_Area'. Please note that the figure used in this calculation is the factor for converting the US Survey Foot value for the length of a meter as opposed to the International Standard for converting meters and feet.

A tool will be developed to ensure there is a consistent transformation of geographic coordinates to projected coordinates and an acreage calculation. A standard conversion constant will be used to ensure consistent acreage computations. The tool and all supporting information are contained in Appendix A of this document.

The following three codes are part of a three tier identification system. While some states may not use the exact naming convention, using the listing as a three tier code will allow for the creation of a unique identifier that is listed as the last required attribute. In addition there are numerous groups within BLM currently using this type of a system and while it will soon be replaced by a new code system from FBMS, this will allow the codes to be linked and migrated to match the new BLM/DOI standards.

### 4. Administrative State Code

This is a two digit state code. The two letter Postal code is the correct value for this attribute.

### 5. Administrative District Office Code

This is a two digit code designating the second administrative layer down from a state office.

### 6. Administrative Field Office Code

This is a three digit code designating the third administrative layer down from a state office.

## 7. Administrative State Allotment Number

This number is a correction of two existing attributes but is not a substitute for having either of those two attributes. It is the existing unique code that allows identification of individual allotments throughout the entire United States. This concatenated number serves as a nationwide unique identifier that allows for a linkage from any unique Allotment polygon in the Geospatial dataset to the RAS dataset.