



FINAL

**LAND HEALTH REPORTING  
DATA STANDARD REPORT**

**May 12, 2012**

**Version 1.5**

**United States Department of Interior  
Bureau of Land Management  
Branch of Resource Data  
OC-530  
Denver Federal Center  
Denver, Colorado 80225**

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**1. Introduction** *General Information about the standard (For more information see WO-IM-2003-125 attachment 2: Guidance for Managing BLM Data Standards: How to Adopt, Implement, and Maintain Data Standards, pages 17-20)*

**Description of Standard**

The Land Health Reporting Data Standard is intended to provide consistent data for reporting the current status of land health on BLM-administered surface lands. This data standard will allow more detailed and better defined information for reporting land health at various levels of the BLM (field office, district office, administrative state). This data standard covers Land Health Standards, Fundamentals, Reporting Categories, Significant Factors, Location, and other related information.

**Reasons why this data standard is being developed:**

This data standard will standardize a way to map and report land health achievements and non-achievements, which will provide an improved way of reporting land condition, and trend in that condition over time. By implementing this data standard, BLM's condition reporting mandate in the Public Rangelands Improvement Act of 1978 will be satisfied. This standard will replace seral status of plant communities, which is the BLM's current way of reporting condition and trend in condition over time. Seral status of plant communities, by itself, is not comprehensive enough to reflect land condition, and no longer is supported by science for that purpose.

This data standard will increase accuracy of land health reporting. Currently, acreages of entire allotments are the basis for reporting of land health achievements and non-achievements. Spatial polygons and linear features, in acres and miles respectively, will be reported under this data standard, allowing for more accurate portrayal of land health achievements and non-achievements.

This data standard will create a spatial component to land health reporting. Neither the seral status reporting, or current land health reporting, has a spatial component. BLM cannot show where, on the ground, the reported conditions are. The ability to map land health achievements and non-achievements will increase BLM's accountability, improve Congress' and public understanding of land conditions, and improve BLM's land use planning.

This data standard will standardize electronic data storage of land health achievement and non-achievement data, allowing the discontinuation of land health data calls to the field. Land health achievement and non-achievement data will be stored in geodatabases and be able to be queried for reporting, thereby discontinuing the need for data calls.

<b>Affected Groups</b> (who is affected, who should care)	Land Use Planners, GIS Specialists, Inter-Disciplinary Teams
<b>Sponsor</b> (business of sponsor)	Ed Roberson, Assistant Director, Renewable Resources and Planning, WO-200

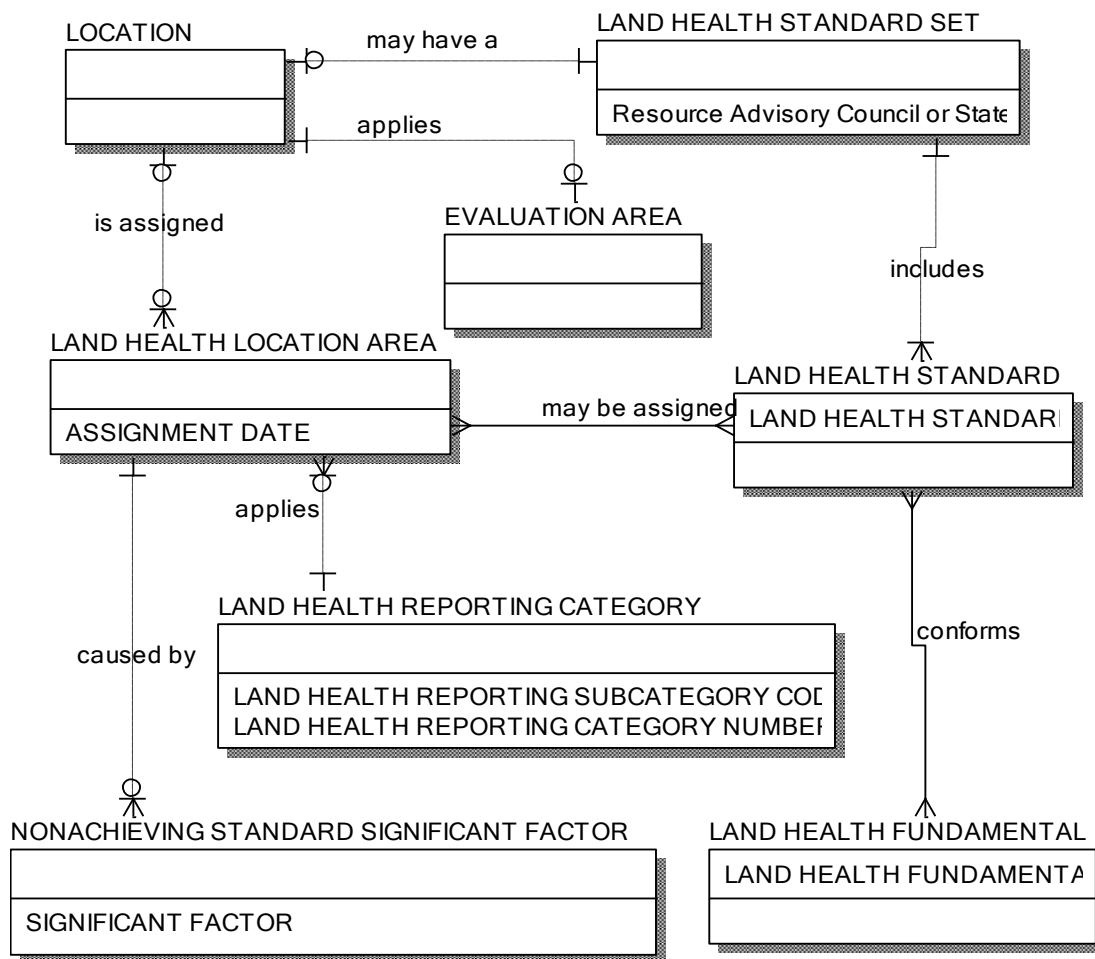
<b>2. Data Steward/GIS Contact Identification:</b> <i>lead agency if appropriate; the data steward(s) and GIS Contact(s)</i>			
<b>Office</b>	<b>Role</b>	<b>Name</b>	<b>Contact Information</b>
OC-570	BLM Business Data Steward	Mike “Sherm” Karl	<a href="mailto:mkarl@blm.gov">mkarl@blm.gov</a> 303-236-0166
WO-210	BLM Geospatial Data Steward	Duane Dippon	<a href="mailto:ddippon@blm.gov">ddippon@blm.gov</a> 202-912-7285
WO-220	BLM Program Lead	David M. DeArmond	<a href="mailto:ddearmond@blm.gov">ddearmond@blm.gov</a> 202-912-7220
WO-220	Rangeland Management Specialist	Richard Mayberry	<a href="mailto:rmayberr@blm.gov">rmayberr@blm.gov</a> 202-912-7229

<b>3. Data Set Characteristics</b>		
<b>Overall Security:</b> Identify security level If non-public state why	<b>Public</b>	
<b>Who has create, read, update, and/or delete privileges</b>	<b>GIS Specialists, Other personnel as necessary</b>	
<b>Data Collection &amp; Maintenance Protocols:</b> data collection and maintenance procedures that would apply	a) Accuracy Requirements: what level is required?	The accuracy (correctness) of the data that is expected is at least 90%).  The accuracy of the location is expected to be + or – 5 meter).
	b) Collection & Input Protocols: what are approved methods?  For Geospatial Data the information relating to collection datum and projection should be included in this section.	There is currently no single method for data collection and input for this data set. Data may be collected and input from a variety of sources as long as the data are documented with metadata. BLM has not yet migrated enough of its existing data stores to any specific format to eliminate any methods for digital data collection.
	c) Update Procedures: On what basis are updates completed (e.g. township basis, case file basis); how often; by when?	Each field office will track all changes in delineations of land health polygons and arcs, and all changes in land health reporting categories that are applied to existing polygons and arcs, and input any changes into the geodatabase at a minimum of once per year.

<p><b>Data Quality:</b> measures that will be applied to the data</p>	<p>a) Transaction level data quality: how will the review of data quality take place during data entry</p>	<p>Implementation will include domain value edits during data entry. When assigning a reporting category to a polygon in a given year, the polygon for a specific land health standard will not overlap.</p>
	<p>b) Monitoring level data quality: what systematic review of data quality will take place and how will it be done?</p>	<p>GIS Specialists and Land Health Interdisciplinary Team Leads should review the data for quality upon entry. To ensure accurate reporting of BLM Land Health Acres, the Administrative State Office (SO) will validate that the total number of acres reported in a year for a Land Health Standard match the total BLM acres the SO has on record for that same year.</p>
<p><b>Relationship to Other Standards:</b> Identify any other data standards (or applications) that are related; these can include national, state, local, or other agencies/organizations; identify data element that would tie them together (e.g. RIPS by allotment number)</p>		<p>Grazing Boundaries- related via geospatial overlay                      BLM Administrative Office Boundaries- related via geospatial overlay, reporting summed by areas.                      [National Hydrologic Unit Boundaries, particularly the sub-watershed (6<sup>th</sup> code), watershed (5<sup>th</sup> code), and sub-basin (4<sup>th</sup> code) levels—related via geospatial overlay]</p>

**4. Data Model Characteristics** *Each data standard is to be supported by a data model which includes entities and relationships between entities*

**Land Health Reporting (LHR) Conceptual Data Model**



A LOCATION is a point, line or polygon. For Land Health there will be:  
 EVALUATION AREAS - total area being evaluated  
 LAND HEALTH LOCATION AREA - the area where a standard applies

There are 18 LAND HEALTH STANDARD SETs, each with 3 to 8 LAND HEALTH STANDARDS.

A STANDARD conforms to 0 or more LAND HEALTH FUNDAMENTALS  
 A FUNDAMENTAL conforms to 1 or more STANDARDS.

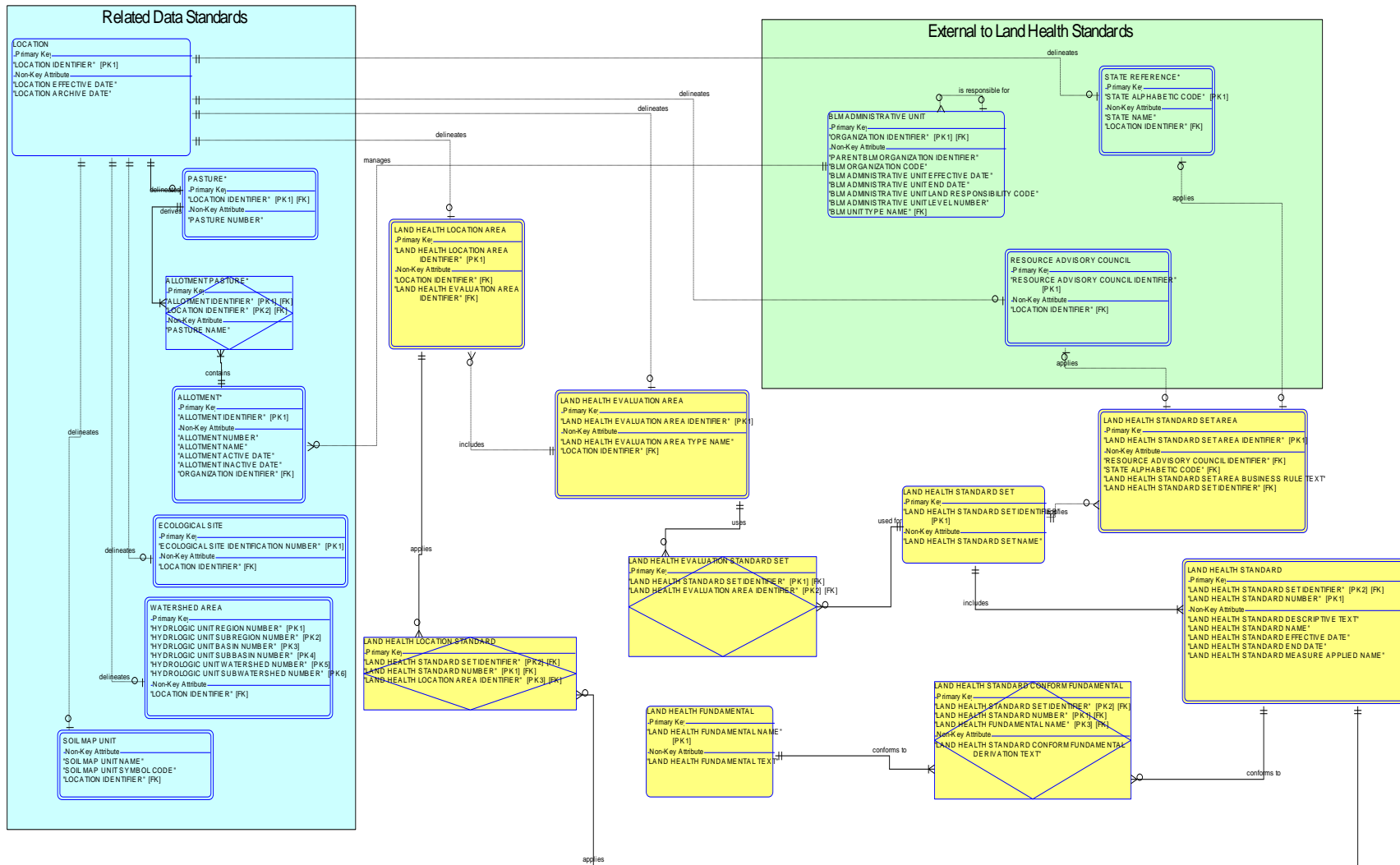
A LOCATION will have a STANDARD applied to it. This STANDARD will be assigned a LAND HEALTH REPORTING CATEGORY NUMBER and SUBCATEGORY CODE.

If the CATEGORY NUMBER is 2 and SUBCATEGORY CODE = C,D or E, one or more SIGNIFICANT FACTORS that cause the nonachievement will be assigned to the LOCATION for that specific STANDARD.

### Land Health Reporting - Land Health Standards

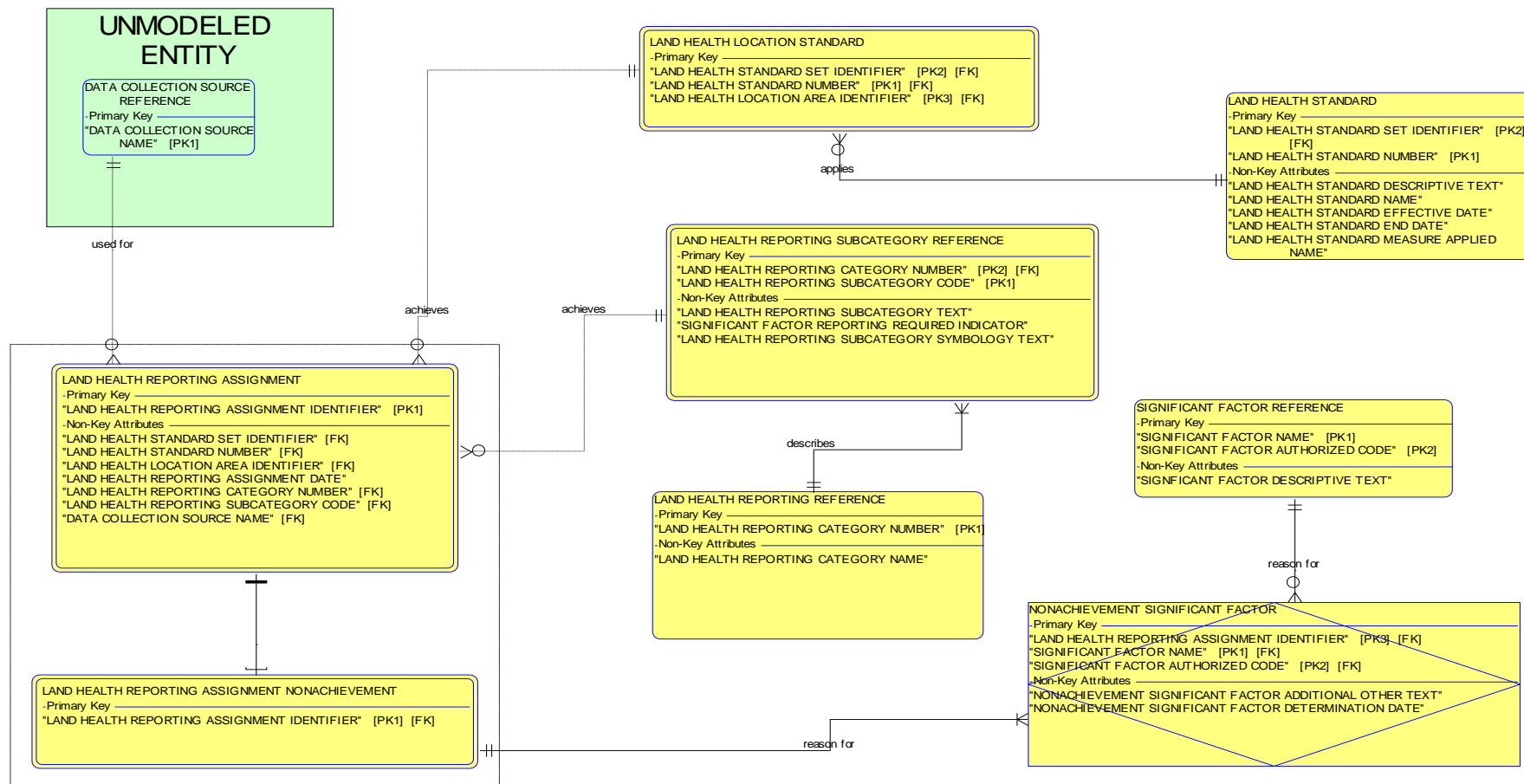
This is a diagram of land health standards and their relationship to land health fundamentals. The entities in the shaded areas (green and blue) are not part of this standard (and do not need to be reviewed). They are provided to show context and provide relationships to other data only. To improve viewing, zoom to 200%; to print a larger version, use the 11'x17' model on the same webpage as this document.

BLM Land Health Standard - Land Standards 7/30/2008 Version 8 DRAFT



## Land Health Reporting - Land Health Reporting

This is a diagram of reporting on the achievement or non-achievement of land health standards. The entities in the shaded areas (green) are not part of this standard (and do not need to be reviewed). They are provided to show context and provide relationships to other data only.



Legend: PK (Primary Key) – uniquely identifies one occurrence (row) of the entity; FK (Foreign Key): is all or part of the PK of another entity it is related to. PK1, PK2 – indicates the PK is made of more than 1 attribute to make it unique. The Word Identifier indicates that this will be a designed key, its format is not known, but the modeling tool required a format and size. The actual content and size of the identifier will be determined during design



This lists all entities and attributes (in alphabetical order, not hierarchical or chronological order) in the logical data model shown above. The items in gray are not part of this data standard and are included for context, information, and to show relationships to other data.

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
<b>LAND HEALTH EVALUATION AREA</b>						
An area for which land health standards are being evaluated using a set of land health standards that are unique to a given state or Resource Advisory Council area.						
		LAND HEALTH EVALUATION AREA TYPE NAME	character	20	Yes	The name of the type of area that was evaluated for a set of land health standards.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH EVALUATION AREA IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LAND HEALTH EVALUATION STANDARD SET</b>						
The set of land health standards for an administrative state or RAC area that is used for a given evaluation area.						
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH EVALUATION AREA IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LAND HEALTH FUNDAMENTAL</b>						
Land health fundamentals are fundamental requirements for achieving functional healthy public lands. The fundamentals address the necessary physical components of functional watersheds, ecological processes required for healthy biotic communities, water quality standards, and habitat for threatened or endangered species or other species of special interest.						
		LAND HEALTH FUNDAMENTAL NAME	character	40	Yes	A descriptive name created by BLM for a Land Health Fundamental identified in 43 CFR 4180.1. Valid names are: Watershed Function Uplands, Watershed Function Riparian, Ecological Processes, Water Quality, and Habitat Quality for Threatened and Endangered and Special Status Species.
		LAND HEALTH FUNDAMENTAL TEXT	character	100	Yes	The text that provides the description of Land Health Fundamental Name from CFR 4180.1.
<b>LAND HEALTH LOCATION AREA</b>						
The specific polygon and its acres, or specific line and its miles, that are assigned a land health reporting category						
		LAND HEALTH LOCATION AREA IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
		LAND HEALTH EVALUATION AREA IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LAND HEALTH LOCATION STANDARD</b>						
The specific land health standard that is applied to a Land Health Location Area.						
		LAND HEALTH STANDARD NUMBER	character	2	Yes	The number assigned by the state or Resource Advisory Council Area to the land health standard.
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH LOCATION AREA IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LAND HEALTH REPORTING ASSIGNMENT</b>						
The land health reporting category and land health reporting subcategory that are assigned to a land health standard on a land health location area.						
		LAND HEALTH REPORTING ASSIGNMENT IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH REPORTING CATEGORY NUMBER	character	1	Yes	The number associated with the Land Health Reporting Category Name.
		LAND HEALTH STANDARD NUMBER	character	2	Yes	The number assigned by the state or Resource Advisory Council Area to the land health standard.
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH REPORTING ASSIGNMENT DATE	date		Yes	The date on which the land health reporting category was assigned to the location.
		LAND HEALTH LOCATION AREA IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH REPORTING SUBCATEGORY CODE	character	2	Yes	A code that describes additional information about the Land Health Reporting Category for an area.
		DATA COLLECTION SOURCE NAME	character	20	Yes	The name of the collection source used to support the choice of the reporting category value.
<b>LAND HEALTH REPORTING ASSIGNMENT NONACHIEVEMENT</b>						
A subtype of the Land Health Reporting Assignment associated with some of the non-achievement land health reporting subcategory.						
		LAND HEALTH REPORTING ASSIGNMENT IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
<b>LAND HEALTH REPORTING REFERENCE</b>						
The domain of values for the reporting categories of land health.						
		LAND HEALTH REPORTING CATEGORY NUMBER	character	1	Yes	The number associated with the Land Health Reporting Category Name.
		LAND HEALTH REPORTING CATEGORY NAME	character	25	Yes	The name that designates the category for whether or not an area has or has not achieved the land health standard.
<b>LAND HEALTH STANDARD</b>						
Land Health Standards are ecologically-based goal statements that conform with the Fundamentals of Rangeland Health found in 43 Code of Federal Regulations Subpart 4180, dated February 22, 1995.						
		LAND HEALTH STANDARD EFFECTIVE DATE	date		Yes	The date on which a land health standard becomes effective.
		LAND HEALTH STANDARD END DATE	date		Opt	The date on which a land health standard is no longer effective.
		LAND HEALTH STANDARD MEASURE APPLIED NAME	character	4	Yes	The name that indicates the type of measure to which the standard applies. It can apply to an area, a line or both.
		LAND HEALTH STANDARD NAME	character	40	Opt	A thematic name associated with a land health standard.
		LAND HEALTH STANDARD NUMBER	character	2	Yes	The number assigned by the state or Resource Advisory Council Area to the land health standard.
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH STANDARD DESCRIPTIVE TEXT	character	200	Opt	The text that contains the wording of the Land Health Standard.
<b>LAND HEALTH STANDARD CONFORM FUNDAMENTAL</b>						
The Land Health Standard(s) that conform to a Land Health Fundamental.						
		LAND HEALTH STANDARD CONFORM FUNDAMENTAL DERIVATION TEXT	character	200	Opt	The text that describes why the Land Health Standard conforms to a Fundamental.
		LAND HEALTH STANDARD NUMBER	character	2	Yes	The number assigned by the state or Resource Advisory Council Area to the land health standard.
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
		LAND HEALTH FUNDAMENTAL NAME	character	40	Yes	A descriptive name created by BLM for a Land Health Fundamental identified in 43 CFR 4180.1. Valid names are: Watershed Function Uplands, Watershed Function Riparian, Ecological Processes, Water Quality, and Habitat Quality for Threatened and Endangered and Special Status Species.
<b>LAND HEALTH STANDARD SET</b>						
A set of land health standards that were approved by the Secretary of the Interior for a given administrative state or RAC area.						
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH STANDARD SET NAME	character	40	Opt	The name associated with a group of land health standards.
<b>LAND HEALTH STANDARD SET AREA</b>						
The information that identifies the area to which a Land Health Standard set applies.						
		RESOURCE ADVISORY COUNCIL IDENTIFIER	integer		Opt	The designed primary key that will uniquely identify a single occurrence of the entity.
		STATE ALPHABETIC CODE	character	2	Opt	An alphabetic abbreviation that represents each of the 50 states of the United States, the District of Columbia, the outlying areas of the United States, and associated areas. FIPS PUB 5-2
		LAND HEALTH STANDARD SET AREA IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH STANDARD SET AREA BUSINESS RULE TEXT	character	100	Opt	The text that describes the business rules for which geographic area a set of Land Health Standards applies to. Four situations exist. First, an administrative state may not have a RAC, for example Wyoming. Wyoming has its own set of Land Health Standards. Second, an administrative state may have one RAC, for example Utah. Utah has its own set of Land Health Standards. Third, an administrative state may have more than one RAC, for example Oregon-Washington. Each RAC has agreed to accept one set of Land Health Standards and therefore even though Oregon-Washington has more than one RAC, only one set of Land Health Standards applies to Oregon-Washington. Fourth, an administrative state may have more than one RAC and each RAC has its own set of Land Health Standards, for example Nevada.
<b>NONACHIEVEMENT SIGNIFICANT FACTOR</b>						
The significant BLM-related factors that contributed to a location that is not achieving land health.						
		LAND HEALTH REPORTING ASSIGNMENT IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
		SIGNIFICANT FACTOR NAME	character	40	Yes	The name that designates the significant BLM-related factor for why a location is not achieving land health.
		SIGNIFICANT FACTOR AUTHORIZED CODE	character	1	Yes	A code that designates if the significant factor was an authorized or unauthorized use of the land.
		NONACHIEVEMENT SIGNIFICANT FACTOR ADDITIONAL OTHER TEXT	character	200	Opt	The text that describes any additional comments or information about the Significant Factor that contributes to the non-achievement, usually used when the Significant Factor "Other" is selected'.
		NONACHIEVEMENT SIGNIFICANT FACTOR DETERMINATION DATE	Date		Yes	The date on which the work was completed for determining the causal factors on why the area was not achieving land health.

### SIGNIFICANT FACTOR REFERENCE

The domain of values for Significant Factors which are BLM-related as to why a location is not achieving land health.

		SIGNIFICANT FACTOR NAME	character	40	Yes	The name that designates the significant BLM-related factor for why a location is not achieving land health.
		SIGNIFICANT FACTOR DESCRIPTIVE TEXT	character	100	Yes	The text that describes when a factor would be chosen.
		SIGNIFICANT FACTOR AUTHORIZED CODE	character	1	Yes	A code that designates if the significant factor was an authorized or unauthorized use of the land.

### LAND HEALTH REPORTING SUBCATEGORY REFERENCE

The domain of values for the alphabetic codes associated with the Land Health Reporting Category Number that further defines the Reporting Category.

		LAND HEALTH REPORTING SUBCATEGORY TEXT	character	100	Yes	The text that describes code that is associated with the Land Health Reporting Category.
		LAND HEALTH REPORTING SUBCATEGORY CODE	character	2	Yes	A code that describes additional information about the Land Health Reporting Category for an area.
		SIGNIFICANT FACTOR REPORTING REQUIRED INDICATOR	character	3	Yes	An indicator that designates whether or not significant (causal) factors need to be associated with the Land Health Reporting Assignment. Valid values: yes, no.
		LAND HEALTH REPORTING SUBCATEGORY SYMBOLOGY TEXT	character	100	Yes	The text that describes the symbology that will be used to display each Land Health Reporting Category and Land Health Reporting Subcategory.
		LAND HEALTH REPORTING CATEGORY NUMBER	character	1	Yes	The number associated with the Land Health Reporting Category Name.

The following entities shown on the logical data model are **NOT** part of the data standard and therefore, will **NOT** be included in the standard but are here for informational purposes. These entities and attributes do **NOT** need to be reviewed.

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
<b>ALLOTMENT</b>						
An Allotment is 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. An allotment is derived from its pastures.						
		ALLOTMENT NAME	character	50	Yes	The name by which the allotment is commonly known.
		ALLOTMENT NUMBER	character	5	Yes	The number that identifies an Allotment which is unique within the BLM administrative state. Note: 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. The leading zeros must be included in the values entered in this field. '00045' is the correct entry, not '45'
		ALLOTMENT IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		ALLOTMENT ACTIVE DATE	date		Yes	The calendar date on which the boundary of an allotment is established and becomes effective. The date will be in FGDC standard format of YYYYMMDD, and will be entered only once for that polygon.
		ALLOTMENT INACTIVE DATE	date		Opt	The calendar date on which the boundary of an allotment is no longer effective because the external boundary of the allotment changed or it is no longer used as an allotment. Business Rules: Allotments with End Dates are a separate feature class from Active Allotments. The date will be in FGDC standard format of YYYYMMDD, and will be entered only once for that polygon.
		ORGANIZATION IDENTIFIER	integer		Yes	The unique system generated number that identifies a single occurrence of the entity
<b>ALLOTMENT PASTURE</b>						
The association of which pastures belong to a given allotment. Business Rule: if the internal boundaries of pastures change, the allotment does not change. If the allotment size changes for administrative reasons, a new allotment number is created and the old allotment becomes inactive.						
		PASTURE NAME	character	50	Yes	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'.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		ALLOTMENT IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>BLM ADMINISTRATIVE UNIT</b>						
An organizational unit within BLM which has distinct jurisdictional responsibility for all activities in a geographic area. The formal grouping of positions into designated units and the assignment of functions and responsibilities to those units. This also includes the identification of supervisory/subordinate relationships and the interdependent activity between units.						

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
		ORGANIZATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		ADMINISTRATIVE BLM ORGANIZATION CODE	character	7	Opt	The code for the administrative unit that has responsibility for other units. Administrative State Office is responsible for District Offices. District Offices are responsible for Field Offices.
		BLM ORGANIZATION CODE	character	7	Yes	The code that indicates the formal grouping of positions into designated units and the assignment of functions and responsibilities to those units.
<b>DATA COLLECTION SOURCE REFERENCE</b>						
The domain of values for what was used to support the choice of the reporting category value.						
		DATA COLLECTION SOURCE NAME	character	20	Yes	The name of the collection source used to support the choice of the reporting category value.
<b>ECOLOGICAL SITE</b>						
A functional edaphic unit which is a distinctive kind of land with specific soil and physical characteristics that differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation, and in its ability to respond similarly to management actions and natural disturbances.						
		ECOLOGICAL SITE IDENTIFICATION NUMBER	character	10	Yes	A number that consists of a site type-either R for rangeland or F for forestland-followed by 3 digits and a character for the Major Land Resource Area (MLRA), 1 character for the Land Resource Unit (LRU), a 3 digit unique number assigned by a state, and a 2 character state postal code. An example is R035XF603AZ.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LOCATION</b>						
A defined place that requires a way to locate it by some means.						
		LOCATION ARCHIVE DATE	date		Yes	The date which is the calendar year, month, and day when the position of the Location is considered no longer valid but has historical value.
		LOCATION EFFECTIVE DATE	date		Yes	The date which is the calendar year, month, and day when the position of the Location was produced.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>PASTURE</b>						
A pasture is an area that is a subset area of an allotment. Allotments may have one or more pastures.						
		PASTURE NUMBER	character	2	Yes	The number that identifies a specific pasture within one Allotment. Note: numbering usually starts at 1 for each allotment.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>RESOURCE ADVISORY COUNCIL</b>						

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
<p>The Bureau of Land Management has formed 25 Resource Advisory Councils (RACs) in the western States to provide advice on the management of public lands and resources. These citizen-based groups provide an opportunity for individuals from all backgrounds and interests to have a voice in the management of these lands, to help improve their health and productivity. Each RAC consists of 12 to 15 members from diverse interests in local communities, including ranchers, environmental groups, tribes, State and local government officials, academics, and other public land users. The councils have been successful in bringing diverse and often competing interests to the table to deal with issues of mutual concern.</p>						
		RESOURCE ADVISORY COUNCIL IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>SOIL MAP UNIT</b>						
<p>A soil map unit is a collection of areas defined and named the same in terms of their soil components or miscellaneous areas or both. Each soil map unit differs in some respect from all others in a soil survey area and each soil map unit has a symbol that uniquely identifies the soil map unit on a soil map. Each individual area, point, or line so identified on the soil map is a delineation. Soil map units in adjoining soil survey areas are comparable especially within the same major land resource area.</p>						
		SOIL MAP UNIT NAME	character	40	Yes	The name that accurately and uniquely identifies the unit within the legend used. Two or more soil phase terms are commonly part of most soil map unit names. A phase term conveys important connotations about the map unit and distinguishes it from other map units. The Natural Resources Conservation Service soil survey project office names map units according to the procedures in the National Soil Survey Handbook and the descriptions in the Soil Survey Manual.
		SOIL MAP UNIT SYMBOL CODE	character	6	Yes	Soil survey map unit symbols combine alpha, alpha-numeric, or numeric characters. Symbols should be as short as possible, but may contain up to six characters, including special characters like hyphens.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>STATE</b>						
<p>The domain values for the 50 states of the United States, the District of Columbia, the outlying areas of the United States, and associated areas.</p>						
		STATE NAME	character	40	Yes	The name of one of the 50 states of the United States, the District of Columbia, the outlying areas of the United States, and associated areas.
		STATE ALPHABETIC CODE	character	2	Yes	An alphabetic abbreviation that represents each of the 50 states of the United States, the District of Columbia, the outlying areas of the United States, and associated areas. FIPS PUB 5-2
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>WATERSHED AREA</b>						
<p>A watershed is the area of land where all of the water drains to the same place – this includes water that flows on the surface and water located underground. Watersheds come in all shapes and sizes. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge.</p>						



Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
		HYDRLOGIC UNIT BASIN NUMBER	character	2	Yes	The number associated with the third level of the hydrologic unit hierarchy, basins are nested within or are sometimes equivalent to sub-regions. Basins were formerly named "accounting units."
		HYDRLOGIC UNIT REGION NUMBER	character	2	Yes	The number associated with the first level of the hydrologic unit hierarchy, a region which is the largest drainage basins, containing either the drainage area of a major river or the combined drainage areas of several rivers. These 21 geographic areas contain either the drainage area of a major river, such as the Missouri region, or the combined drainage areas of a series of rivers, such as the Texas-Gulf region, which includes a number of rivers draining into the Gulf of Mexico.
		HYDRLOGIC UNIT SUBBASIN NUMBER	character	2	Yes	The number associated with the fourth level of the hydrologic unit hierarchy, subdivisions of basins. Sub-basins were formerly named "cataloging unit". The average size is about 450,000 acres.
		HYDRLOGIC UNIT SUBREGION NUMBER	character	2	Yes	The number associated with the second level of the hydrologic unit hierarchy divides the 21 regions into 221 subregions. A subregion includes the area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin(s), or a group of streams forming a coastal drainage area.
		HYDRLOGIC UNIT SUBWATERSHED NUMBER	character	2	Yes	The number associated with the sixth level of the hydrologic unit hierarchy, subdivisions within watersheds. Subwatershed is the sixth level (12- digit) in the hydrologic unit hierarchy. Subwatersheds generally range in size from 10,000 to 40,000 acres.
		HYDROLOGIC UNIT WATERSHED NUMBER	character	2	Yes	The number associated with the fifth level of classification in the hierarchy of hydrologic units, nested within subbasins.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.

## 5. Business Rules

*Rules under which data is used and modified (See H 1283-1, Data Administration and Management Handbook, Chapter 8 – Documenting Business Rules)*

### 1. Areas Exempted from Achieving Land Health

If an area is exempt from achieving land health and allocated in land use plans as such, reporting category 2c is used and the significant factor "exempt from achieving land health in LUP" is selected. If the "exempt" significant factor is selected, another significant factor must be selected that indicates what the exempted significant factor is. The "exempt" significant factor is only used in conjunction with reporting category 2c.

Business Rule Source and Description

Guidance

Developed as part of the standard

Type of Business Rule	Current Implementation
Standard (Mandatory)	Manual Process

## **2. Land Health Evaluation Areas that Cross BLM Office Boundaries**

The office that conducts the land health evaluation in the evaluation area (e.g. Allotments or Watersheds), will report on Land Health, even if portions of the evaluation area are within another state or field office boundary.	
Business Rule Source and Description	
Guidance Developed as part of the standard	
Type of Business Rule	Current Implementation
Standard (Mandatory)	Manual Process

## **3. Key for Identifying Fundamental LHR Category when Multiple Land Health Standards Conform to a Fundamental**

The key documented in Business Rule 2 in Appendix D will be used to assign a land health reporting category to a polygon or line feature for a land health fundamental, when more than one land health standard conforms to the fundamental (in other words, overlapping polygons or line features associated with overlapping land health standard themes, and land health reporting categories are different across themes).	
Business Rule Source and Description	
Guidance Developed as part of the standard	
Type of Business Rule	Current Implementation
Standard (Mandatory)	Manual Process

## **4. Equations for Calculating DO and Administrative SO Land Health Achievement/Non-Achievement**

Equations for reporting District Office and Administrative State Office calculations of land health achievements and non-achievements of land health standards and fundamentals are in Business Rule 3 in Appendix D. The appropriate equation documented in Business Rule 3 in Appendix D will be used to calculate percentage of acres (miles) that are achieving or not achieving land health standards or land health fundamentals. The percentages will be used to determine in which one of five Display categories (range of percentages) the results fall.	
Business Rule Source and Description	
Guidance Developed as part of the standard	
Type of Business Rule	Current Implementation
Standard (Mandatory)	Manual Process

## 5. Reporting Category Definitions and Applications

The definitions for each land health reporting category and examples of how they are applied to the ground. These are documented in Business Rule 4 in Appendix D.

Business Rule Source and Description

Guidance

Developed as part of the standard

Type of Business Rule

Current Implementation

Standard (Mandatory)

Manual Process

## 6. Reporting Category Changes Allowed Over Time

Land Health Reporting Categories can change over time. However, only certain land health reporting category changes are allowed to the Polygons or Line Features. The matrix in Business Rule 5 in Appendix D documents the Allowed and Unallowed land health reporting Category Changes from one time period to a future time period. The rationales for each of the allowed and unallowed land health reporting category changes can be found in Business Rule 5 in Appendix D also.

Business Rule Source and Description

Guidance

Developed as part of the standard

Type of Business Rule

Current Implementation

Standard (Mandatory)

Manual Process

## 7. Re-Categorizing Historical Land Health Reporting Categories to New Reporting Categories

Historical land health reporting categories exist that are being replaced by the new land health reporting categories in this data standard. In the FGDC Metadata for the data set:

- document the historical land health reporting category for those lands that have been re-categorized to the reporting categories in this data standard.
- include the dates (beginning and end date range) of the previous land health reporting categories that have been converted to the reporting categories as outlined in this data standard

For those data sets converted, which include a reporting date, use the same reporting date in the new dataset as documented in the old data.

If a reporting date is unknown use 09/09/9999 for the reporting date.

Business Rule Source and Description

Guidance

Developed as part of the standard

Type of Business Rule

Current Implementation

Standard (Mandatory)

Manual Process

## 8. Terminology and Processes for Land Health Reporting

Use the processes and terminology as described in the Land Health Reporting Handbook H-4180-1 and supplemented by processes and terminology documented in Instruction Memorandum WO IM 2009-007.

Business Rule Source and Description

Handbook

Land Health Reporting Handbook 4180 .2

Type of Business Rule

Current Implementation

Standard (Mandatory)

Manual Process

**6. Other Material** Any other supporting material that aids in the understanding or use of the data standard; include specific geographic, organizational, or applicability constraints for non-national standards

- Land Health Reporting Data Standard Proposal

## 7. Domains Specific to Land Health Reporting

[Link to domains](#)

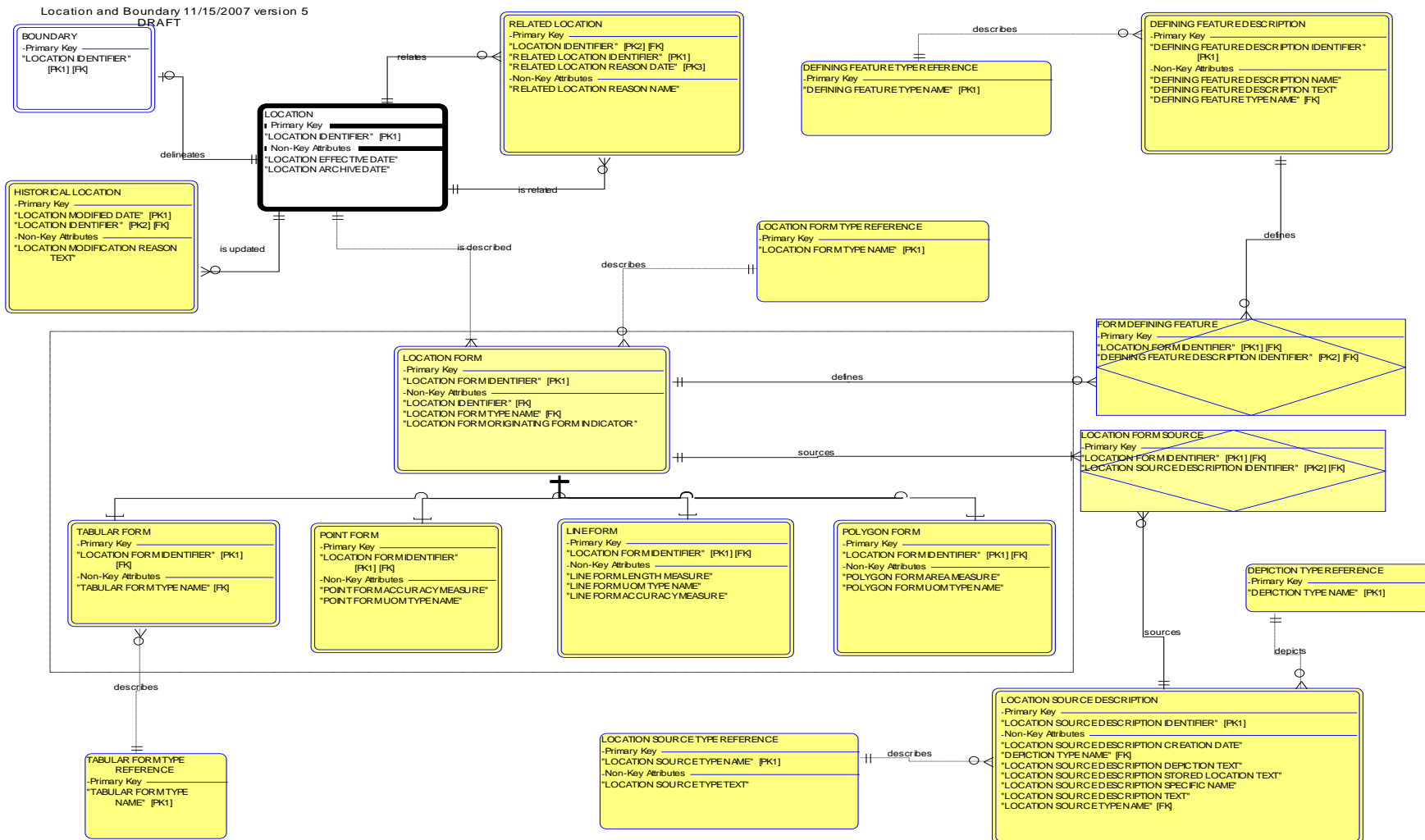
## Appendix A – Data Categories

<i>How this standard fits into/supports the Bureau Enterprise Architecture.</i>	
What DOI Subject Areas and Information Classes does this standard cover?	
<b>Subject Area:</b> A collection of data classifications representing broad categories of information that support a line of business.	
<b>Information Class:</b> A logical grouping of entities that are subcategories of the subject areas.	
For the full list of Subject Areas and their Information Classes please see <a href="http://web.blm.gov/data_mgt/guidelines/DOI_SubjectArea_InfoClass.doc">http://web.blm.gov/data_mgt/guidelines/DOI_SubjectArea_InfoClass.doc</a>	
<b>Asset</b> (Subject Area)	<i>Information about the items, objects, and property used to support the activities required to keep the Department and Bureaus functioning.</i>
<ul style="list-style-type: none"> <li>• Land (Information Class)</li> </ul>	<i>The earth's surface, extending downward to the center of the earth and upward into space.</i>
<ul style="list-style-type: none"> <li>• Right (Information Class)</li> </ul>	<i>A just and legal claim to hold, use, enjoy, or remove something from real property.</i>
<b>Controls and Oversight</b> (Subject Area)	<i>Information about the supervision, oversight, and administrative operations and programs of the DOI and its external partners that ensure compliance with applicable laws and regulations, and the prevention of waste, fraud and abuse. This includes the evaluation of conformance with policy, guidance, standards, and statutory requirements, as well as a means to evaluate the overall quality of products and services.</i>
<ul style="list-style-type: none"> <li>• Assessment (Information Class)</li> </ul>	<i>The process of gathering qualitative and/or quantitative information for the purpose of making a judgment or decision.</i>
<ul style="list-style-type: none"> <li>• Conservation (Information Class)</li> </ul>	<i>Information about activities devoted to ensuring the preservation of land, water, wildlife, and natural resources, both domestically and internationally. It also includes information about the sustainable stewardship of natural resources on federally owned/controlled lands for commercial use (mineral mining, grazing, forestry, fishing, etc.).</i>
<ul style="list-style-type: none"> <li>• Inspection (Information Class)</li> </ul>	<i>Information related to an official review or examination of DOI interests and activities to confirm safety, condition and compliance with applicable laws, standards, and regulations.</i>
<b>Geospatial</b> (Subject Area)	<i>Information about data that includes a terrestrial coordinate system or geographic reference. This includes geospatial data sets, mapping, imagery, coverage's, elevations, and features.</i>
<ul style="list-style-type: none"> <li>• Map (Information Class)</li> </ul>	<i>A graphic depiction on a flat surface of the physical features of the whole or a part of the earth or other body, or of the heavens, using shapes to represent objects and symbols to describe their nature. Maps generally use a specified projection and indicate the direction of orientation.</i>
<ul style="list-style-type: none"> <li>• Spatial Data Set (Information Class)</li> </ul>	<i>A collection of spatial data and its related descriptive data, organized for efficient storage and retrieval. A simple data set might be a single file with many records, each of which references the same set of fields. A more robust spatial data set includes data about the spatial locations and shapes of geographic features, recorded as points, lines, areas, pixels, grid cells, or TIN (Triangulated Irregular Network) sample points, as well as their attributes.</i>

<b>Natural and Cultural Resource</b> (Subject Area)	<i>Information about the natural and ecological resources, cultural resources, cultural resources, archaeological, and paleontology resources, and national heritage resources of the nation.</i>
<ul style="list-style-type: none"> <li>Monitoring and Forecasting (Information Class)</li> </ul>	<i>Information related to the continuous or repeated observation, measurement, surveying, and evaluation of activities or conditions for defined purposes, according to prearranged schedules, and using comparable methods for sensing and data collection. This includes information on forecasting, which is the estimation or prediction of future outcomes, events, or conditions based on existing data and facts, often using predictive models.</i>
<b>Protection</b> (Subject Area)	<i>Information about activities that protect something or someone from exposure, injury, damage, or destruction.</i>
<ul style="list-style-type: none"> <li>Endangered Species Protection (Information Class)</li> </ul>	<i>Information about all activities performed to protect plants and animals that are in danger of extinction throughout all or a significant portion of its range, in accordance with the Endangered Species Act of 1973.</i>
<ul style="list-style-type: none"> <li>Habitat Protection (Information Class)</li> </ul>	<i>Information about all activities performed to protect the environment in which an organism or biological population lives and grows.</i>

# Appendix B – Location

Data Model that provides information on standard attributes for feature level metadata. It is **NOT** part of this data standard and does **NOT** need to be reviewed for the data standard, merely provides more information and relationships.



Entity Name	Entity Description	Logical Data Element Name	Type	Size	Req'd?	Key*	Definition
<b>BOUNDARY</b>							DRAFT ENTITY
The edge of a location that demarks the change from one location to another location.							
		LOCATION IDENTIFIER	integer		Yes	PK	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>CONVERTED COORDINATE SYSTEM REFERENCE</b>							DRAFT ENTITY
The domain of values for the algorithm used to convert from one coordinate system to another.							
		COORDINATE SYSTEM CONVERSION ALGORITHM TEXT	character	60	Yes		The text that contains the algorithm used to convert from one coordinate system to another.
		COORDINATE SYSTEM ACRONYM CODE	character	10	Yes	PK, FK	The code that is considered the acronym for the coordinate system type.
		CONVERTED COORDINATE SYSTEM FROM ACRONYM CODE	character	10	Yes	PK	The code for the coordinate system that is being converted from (to another coordinate system).
<b>COORDINATE SYSTEM DIMENSION REFERENCE</b>							DRAFT ENTITY
The dimensions that are part of given coordinate system type.							
		COORDINATE SYSTEM DIMENSION TEXT	character	100	Yes		The text that further describes the dimension for a given coordinate system type.
		COORDINATE SYSTEM DIMENSION CODE	character	10	Yes	PK	The code that is used to designate a dimension for a coordinate system type.
		COORDINATE SYSTEM DIMENSION NAME	character	10	Yes		The name associated with a code that is used to designate a dimension for a coordinate system type.
		COORDINATE SYSTEM ACRONYM CODE	character	10	Yes	PK, FK	The code that is considered the acronym for the coordinate system type.
<b>COORDINATE SYSTEM REFERENCE</b>							DRAFT ENTITY
A reference framework consisting of a set of points, lines and/or surfaces; including a set of rules used to define the positions of points in space in either two or three dimensions.							
		COORDINATE SYSTEM TYPE TEXT	character	100	Yes		The text that describes the particular coordinate system type.
		COORDINATE SYSTEM TYPE NAME	character	40	Yes		The name given to a particular coordinate system type.
		COORDINATE SYSTEM ACRONYM CODE	character	10	Yes	PK	The code that is considered the acronym for the coordinate system type.
		COORDINATE SYSTEM PURPOSE TEXT	character	100	Yes		The text that describes the purpose or purposes of a given coordinate system type.
<b>DEFINING FEATURE DESCRIPTION*</b>							APPROVED ENTITY: BLM
The values associated with second level of detail that can be used to define / create the location, based on the Defining Feature Type Name. There is not a finite set of values for this.							
		DEFINING FEATURE DESCRIPTION NAME	character	40	Opt		The name that identifies a more specific description of the feature from which the arcs are derived to create polygon boundaries. This information further describes the physical or mapping feature that makes up the polygon boundary.
		DEFINING FEATURE DESCRIPTION TEXT	character	200	Yes		The text that provides further details on the Defining Feature Description.



Entity Name	Entity Description	Logical Data Element Name	Type	Size	Req'd?	Key*	Definition
		DEFINING FEATURE DESCRIPTION IDENTIFIER	integer		Yes	PK	The designed primary key that will uniquely identify a single occurrence of the entity.
		DEFINING FEATURE TYPE NAME	character	30	Yes		The name that identifies the high-level category for the actual physical or mapping characteristics (features) from which the arcs are derived.
<b>DEFINING FEATURE TYPE REFERENCE*</b>							APPROVED ENTITY: BLM
A domain for the description of the characteristic (feature) constructed from a geographic feature that was used to create the location boundary.							
		DEFINING FEATURE TYPE NAME	character	30	Yes	PK	The name that identifies the high-level category for the actual physical or mapping characteristics (features) from which the arcs are derived.
<b>DEPICTION TYPE REFERENCE*</b>							APPROVED ENTITY: BLM
The domain of values for the way a location is depicted either in scale or resolution.							
		DEPICTION TYPE NAME	character	10	Yes	PK	The name that designates the detail with which the location is depicted, either in resolution or scale.
<b>FORM DEFINING FEATURE*</b>							APPROVED ENTITY: BLM
The defining features associated with a specific location form.							
		LOCATION FORM IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
		DEFINING FEATURE DESCRIPTION IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>HISTORICAL LOCATION</b>							DRAFT ENTITY
The date and reason why a location's information has changed. Business Rule: this is for administrative changes, not necessarily for corrections to data.							
		LOCATION MODIFICATION REASON TEXT	character	200	Yes		The text which is the explanation for why data about a location has changed for administrative reasons.
		LOCATION MODIFIED DATE	date		Yes	PK	The date which is the calendar year, month, and day when the position of the Location was last modified.
		LOCATION IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LINE FORM</b>							DRAFT ENTITY
A series of connected, co-ordinate points forming a simple linear feature. It is used to represent rivers, and roads, or to form the boundary of polygons. (GIS dictionary) Note: In our current physical environment this includes all types of straight and curved lines including ones that intersection.							
		LOCATION FORM IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
		LINE FORM LENGTH MEASURE	decimal		Yes		The measure of the length of the line described in Line Form UOM Type Name units.
		LINE FORM UOM TYPE NAME	character	20	Yes		The domain value associated with the Unit of Measure used for the Line Form Length Measure.
		LINE FORM ACCURACY MEASURE	decimal		Yes		The measure that describes how close, in Line Form UOM Type Name the actual location is to the spatial depiction.
<b>LOCATION</b>							DRAFT ENTITY
A defined place that requires a way to locate it by some means. Note: Entities linked to Location have the potential for a geospatial aspect.							

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Req'd?	Key*	Definition
		LOCATION ARCHIVE DATE	date		Opt		The date which is the calendar year, month, and day when the position of the Location is considered no longer valid but has historical value.
		LOCATION EFFECTIVE DATE	date		Yes		The date which is the calendar year, month, and day when the position of the Location was produced.
		LOCATION IDENTIFIER	integer		Yes	PK	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LOCATION FORM</b>							DRAFT ENTITY
The form in which the location is described such as the description, shape, or appearance of the location.							
		LOCATION FORM IDENTIFIER	integer		Yes	PK	The designed primary key that will uniquely identify a single occurrence of the entity.
		LOCATION IDENTIFIER	integer		Yes	FK	The designed primary key that will uniquely identify a single occurrence of the entity.
		LOCATION FORM TYPE NAME	character	10	Yes	FK	The type of form in which the location is described or appears. point, line, polygon, tabular
		LOCATION FORM ORIGINATING FORM INDICATOR	character	3	Yes		The value that indicates if this is the way in which the location was first drawn/described. (yes, no)
<b>LOCATION FORM SOURCE*</b>							APPROVED ENTITY: BLM
The actual origin of the location sources that were used to create a specific location form.							
		LOCATION FORM IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
		LOCATION SOURCE DESCRIPTION IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>LOCATION FORM TYPE REFERENCE</b>							DRAFT ENTITY
The domain for the type of form in which the location is described or appears whether in words, numbers of features (point line, polygon). This has been called feature in geospatial communities.							
		LOCATION FORM TYPE NAME	character	10	Yes	PK	The type of form in which the location is described or appears. point, line, polygon, tabular
<b>LOCATION SOURCE DESCRIPTION*</b>							APPROVED ENTITY: BLM
The values that provide a second level of detail about the location (coordinate) source origin. Note: there is not a finite set of these values.							
		LOCATION SOURCE DESCRIPTION CREATION DATE	date		Yes		The date on which the location source was originally created. This could just be a year (ccyy).
		LOCATION SOURCE DESCRIPTION STORED LOCATION TEXT	character	100	Yes		The text that provides the additional description of where the coordinate source can be found
		LOCATION SOURCE DESCRIPTION DEPICTION TEXT	character	20	Yes		The text that describes the actual resolution or scale in which the location is depicted. Examples for Resolution: 1 meter, 10 feet. Examples for Scale: 1 in 10,000, 1 in 100. This does not have a domain or list of valid values.
		DEPICTION TYPE NAME	character	10	Yes	FK	The name that designates the detail with which the location is depicted, either in resolution or scale.
		LOCATION SOURCE DESCRIPTION IDENTIFIER	integer		Yes	PK	The designed primary key that will uniquely identify a single occurrence of the entity.
		LOCATION SOURCE DESCRIPTION TEXT	character	200	Yes		The text that provides further details on the Location (coordinate) Source Description.

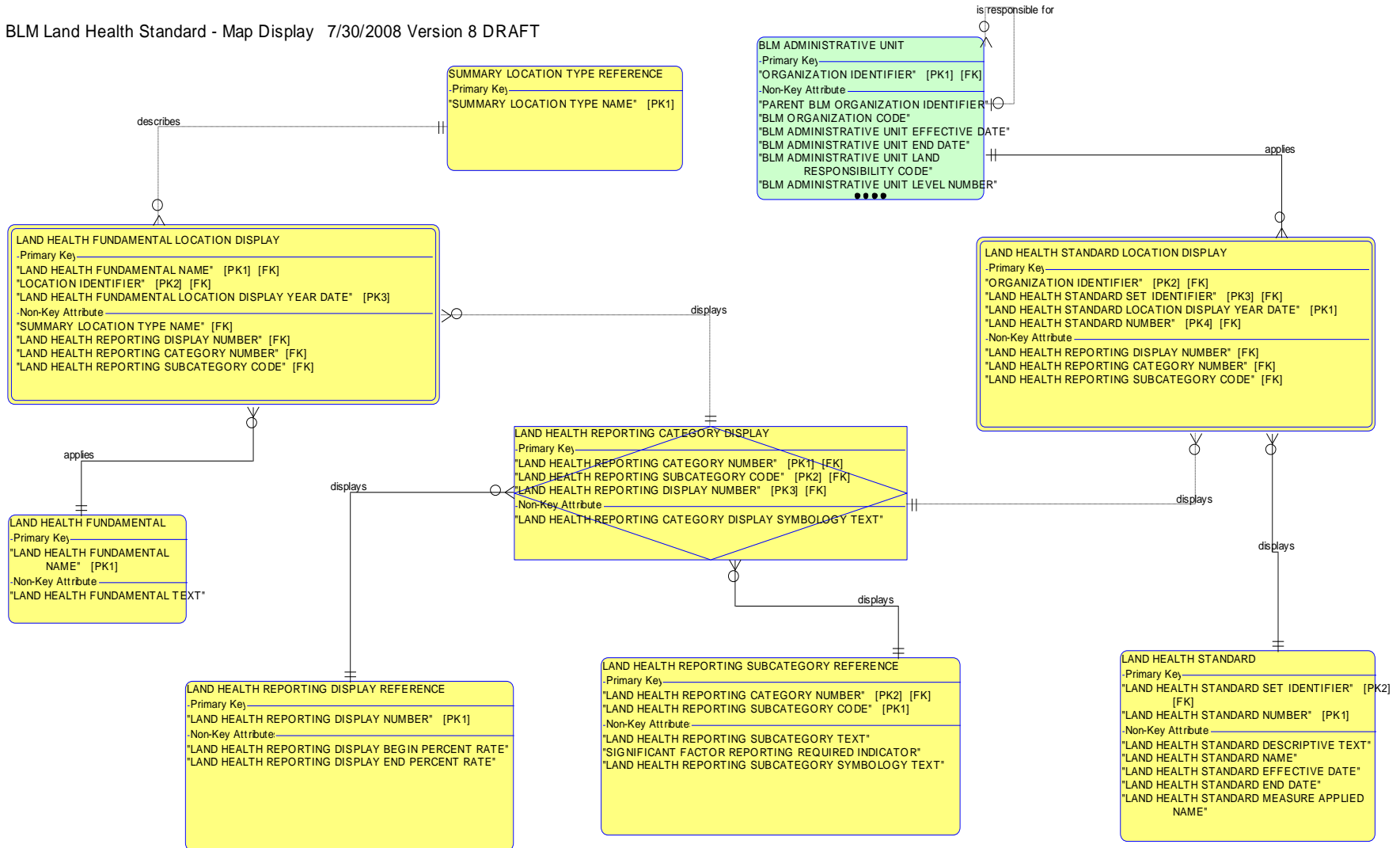
Entity Name	Entity Description	Logical Data Element Name	Type	Size	Req'd?	Key*	Definition
		LOCATION SOURCE DESCRIPTION SPECIFIC NAME	character	40	Opt		The name that identifies a more specific description of the location (coordinate source).
		LOCATION SOURCE TYPE NAME	character	40	Yes	FK	The name that identifies the general category for the origin of the location coordinate, representing a compilation of the state adopted source codes. The domain contains those values that would most likely be used in the determination of source codes for the data set.
<b>LOCATION SOURCE TYPE REFERENCE*</b>							APPROVED ENTITY: BLM
The domain for the types of sources for the original location description / form.							
		LOCATION SOURCE TYPE NAME	character	40	Yes	PK	The name that identifies the general category for the origin of the location coordinate, representing a compilation of the state adopted source codes. The domain contains those values that would most likely be used in the determination of source codes for the data set.
		LOCATION SOURCE TYPE TEXT	character	100	Yes		The text that describes the Location Source Type.
<b>POINT FORM</b>							DRAFT ENTITY
A zero-dimensional abstraction of an object, with its location specified by a set of coordinates. (GIS dictionary)							
		LOCATION FORM IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
		POINT FORM ACCURACY MEASURE	decimal		Yes		The measure that describes how close the spatial depiction of the point is to the actual location.
		POINT FORM UOM TYPE NAME	character	20	Yes		The name of the domain value associated with the Unit of Measure used for the Point Form Accuracy Measure.
<b>POINT FORM DIMENSION</b>							DRAFT ENTITY
The measure associated with each dimension of a Coordinate System.							
		PONT FORM DIMENSION MEASURE	decimal		Yes		The measure that is associated with a specific coordinate system dimension.
		LOCATION FORM IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
		COORDINATE SYSTEM DIMENSION CODE	character	10	Yes	PK, FK	The code that is used to designate a dimension for a coordinate system type.
		COORDINATE SYSTEM ACRONYM CODE	character	10	Yes	PK, FK	The code that is considered the acronym for the coordinate system type.
<b>POLYGON FORM</b>							DRAFT ENTITY
An area bounded by a closed line. It is used to describe spatial elements, such as administrative and political boundaries and areas of homogeneous land use and soil types. (GIS dictionary). Note: In our physical environment, this includes all types of polygons, including ones that overlap.							
		LOCATION FORM IDENTIFIER	integer		Yes	PK	The designed primary key that will uniquely identify a single occurrence of the entity.
		POLYGON FORM UOM TYPE NAME	character	20	Yes		The name of the domain value associated with the Unit of Measure used for the Polygon Form Length Measure.
		POLYGON FORM AREA MEASURE	decimal		Yes		The area of the polygon described in Polygon Form UOM Type Name units.
<b>RELATED LOCATION</b>							DRAFT ENTITY

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Req'd?	Key*	Definition
A valid relationship between two LOCATIONS for a specific reason.							
		RELATED LOCATION IDENTIFIER	integer		Yes	PK	The designed primary key that will uniquely identify a single occurrence of the entity. The first location that has a relationship with another location.
		RELATED LOCATION REASON NAME	character	40	Yes		The name that indicates the reason why two locations are related. Possible values: multi-part polygon, polygon lines, overlapping polygons.
		RELATED LOCATION REASON DATE	date		Yes	PK	The date when two locations became related for the reason stated.
		LOCATION IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
<b>TABULAR FORM</b>							DRAFT ENTITY
Descriptive information about a location, usually alphanumeric. This can be a single name or a combination of attributes that make up an address.							
		LOCATION FORM IDENTIFIER	integer		Yes	PK, FK	The designed primary key that will uniquely identify a single occurrence of the entity.
		TABULAR FORM TYPE NAME	character	20	Yes	FK	The name of the sub-category of the location form type which is true for tabular or alphanumeric descriptions of a location.
<b>TABULAR FORM TYPE REFERENCE</b>							DRAFT ENTITY
The domain for the type of tabular form that is being used to describe the location.							
		TABULAR FORM TYPE NAME	character	20	Yes	PK	The name of the sub-category of the location form type which is true for tabular or alphanumeric descriptions of a location.
							<b>*Key (PK: Primary Key) (FK: Foreign Key which is PK of related entity) (PK, FK: Foreign Key part of PK)</b>

# Appendix C - Land Health Reporting - Geospatial Display

Data Model that provides information on geospatial symbology for land health reporting. This does **NOT** need to be reviewed for the data standard.

BLM Land Health Standard - Map Display 7/30/2008 Version 8 DRAFT



Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
<b>LAND HEALTH FUNDAMENTAL</b>						
Land health fundamentals are fundamental requirements for achieving functional healthy public lands. The fundamentals address the necessary physical components of functional watersheds, ecological processes required for healthy biotic communities, water quality standards, and habitat for threatened or endangered species or other species of special interest.						
		LAND HEALTH FUNDAMENTAL NAME	character	40	Yes	A descriptive name created by BLM for a Land Health Fundamental identified in 43 CFR 4180.1. Valid names are: Watershed Function Uplands, Watershed Function Riparian, Ecological Processes, Water Quality, and Habitat Quality for Threatened and Endangered and Special Status Species.
		LAND HEALTH FUNDAMENTAL TEXT	character	100	Yes	The text that provides the description of Land Health Fundamental Name from CFR 4180.1.
<b>LAND HEALTH FUNDAMENTAL LOCATION DISPLAY</b>						
A location for which a summarized display of acres or miles that are achieving or non-achieving a land health fundamental is presented in a percentage range geospatial format.						
		LAND HEALTH FUNDAMENTAL NAME	character	40	Yes	A descriptive name created by BLM for a Land Health Fundamental identified in 43 CFR 4180.1. Valid names are: Watershed Function Uplands, Watershed Function Riparian, Ecological Processes, Water Quality, and Habitat Quality for Threatened and Endangered and Special Status Species.
		LAND HEALTH FUNDAMENTAL LOCATION DISPLAY YEAR DATE	character	4	Yes	The year for which the land health fundamental location display of acres or miles applies.
		LAND HEALTH REPORTING DISPLAY NUMBER	character	2	Yes	A number that represents a percent range. The percent range is calculated as the assessed acres or miles in a land health fundamental reporting category, compared against the acres or miles that are assessable.
		LOCATION IDENTIFIER	integer		Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH REPORTING CATEGORY NUMBER	character	1	Yes	The number associated with the Land Health Reporting Category Name.
		LAND HEALTH REPORTING SUBCATEGORY CODE	character	2	Yes	A code that describes additional information about the Land Health Reporting Category for an area.
		SUMMARY LOCATION TYPE NAME	character	20	Yes	The name of the type of location that is being summarized or rolled-up to for acres or miles of land health in a percentage range format. Valid values: District Office, Administrative State Office
<b>LAND HEALTH REPORTING DISPLAY REFERENCE</b>						
Information about each range of percentages of acres or miles within each land health reporting category. Applicable when data are summarized for the entire district office and administrative state office. These ranges of percentages will be used to display each summarized level geospatially.						
		LAND HEALTH REPORTING DISPLAY END PERCENT RATE	decimal		Yes	The percentage rate at which the acres or miles that are achieving or not achieving land health ends, for the rollup or summary of displaying geospatial information.
		LAND HEALTH REPORTING DISPLAY BEGIN PERCENT RATE	decimal		Yes	The percentage rate at which the acres or miles that are achieving land health begins for the rollup or summary of displaying geospatial information. For example, the begin percent would be 1% and the end percent would be 25% for one of the categories.

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
		LAND HEALTH REPORTING DISPLAY NUMBER	character	2	Yes	A number that represents a percent range. The percent range is calculated as the assessed acres or miles in a land health fundamental reporting category, compared against the acres or miles that are assessable.
<b>LAND HEALTH STANDARD</b>						
Land Health Standards are ecologically-based goal statements that conform with the Fundamentals of Rangeland Health found in 43 Code of Federal Regulations Subpart 4180, dated February 22, 1995.						
		LAND HEALTH STANDARD EFFECTIVE DATE	date		Yes	The date on which a land health standard becomes effective.
		LAND HEALTH STANDARD END DATE	date		Opt	The date on which a land health standard is no longer effective.
		LAND HEALTH STANDARD NAME	character	40	Opt	A thematic name associated with a land health standard.
		LAND HEALTH STANDARD NUMBER	character	2	Yes	The number assigned by the state or Resource Advisory Council Area to the land health standard.
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH STANDARD DESCRIPTIVE TEXT	character	200	Opt	The text that contains the wording of the Land Health Standard.
<b>LAND HEALTH STANDARD LOCATION DISPLAY</b>						
A location for which a summarized display of acres or miles that are achieving or non-achieving a land health standard is presented in a percentage range geospatial format.						
		LAND HEALTH STANDARD LOCATION DISPLAY YEAR DATE	character	4	Yes	The year for which the land health standard location display of acres or miles applies.
		ORGANIZATION IDENTIFIER	integer		Yes	The unique system generated number that identifies a single occurrence of the entity
		LAND HEALTH STANDARD NUMBER	character	2	Yes	The number assigned by the state or Resource Advisory Council Area to the land health standard.
		LAND HEALTH STANDARD SET IDENTIFIER		10	Yes	The designed primary key that will uniquely identify a single occurrence of the entity.
		LAND HEALTH REPORTING DISPLAY NUMBER	character	2	Yes	A number that represents a percent range. The percent range is calculated as the assessed acres or miles in a land health fundamental reporting category, compared against the acres or miles that are assessable.
		LAND HEALTH REPORTING CATEGORY NUMBER	character	1	Yes	The number associated with the Land Health Reporting Category Name.
		LAND HEALTH REPORTING SUBCATEGORY CODE	character	2	Yes	A code that describes additional information about the Land Health Reporting Category for an area.
<b>LAND HEALTH REPORTING CATEGORY DISPLAY</b>						
The symbology that will display for a given percentage range and Land Health Reporting Subcategory Code.						

Entity Name	Entity Description	Logical Data Element Name	Type	Size	Required?	Definition
		LAND HEALTH REPORTING CATEGORY NUMBER	character	1	Yes	The number associated with the Land Health Reporting Category Name.
		LAND HEALTH REPORTING SUBCATEGORY CODE	character	2	Yes	A code that describes additional information about the Land Health Reporting Category for an area.
		LAND HEALTH REPORTING DISPLAY NUMBER	character	2	Yes	A number that represents a percent range. The percent range is calculated as the assessed acres or miles in a land health fundamental reporting category, compared against the acres or miles that are assessable.
		LAND HEALTH REPORTING CATEGORY DISPLAY SYMBOLOGY TEXT	character	100	Opt	The text that describes the symbology that will be used to display the range of percentages for acres or miles achieving or not achieving land health for a given land health reporting number and land health subcategory code.
<b>LAND HEALTH REPORTING SUBCATEGORY REFERENCE</b>						
The domain of values for the alphabetic codes associated with the Land Health Reporting Category Number that further defines the Reporting Category.						
		LAND HEALTH REPORTING SUBCATEGORY TEXT	character	100	Yes	The text that describes code that is associated with the Land Health Reporting Category.
		LAND HEALTH REPORTING SUBCATEGORY CODE	character	2	Yes	A code that describes additional information about the Land Health Reporting Category for an area.
		SIGNIFICANT FACTOR REPORTING REQUIRED INDICATOR	character	3	Yes	An indicator that designates whether or not significant (causal) factors need to be associated with the Land Health Reporting Assignment. Valid values: yes, no.
		LAND HEALTH REPORTING SUBCATEGORY SYMBOLOGY TEXT	character	100	Yes	The text that describes the symbology that will be used to display each Land Health Reporting Category and Land Health Reporting Subcategory.
		LAND HEALTH REPORTING CATEGORY NUMBER	character	1	Yes	The number associated with the Land Health Reporting Category Name.
<b>SUMMARY LOCATION TYPE REFERENCE</b>						
The domain of values for the type of location that land health data are summarized or rolled-up to in a percentage range.						
		SUMMARY LOCATION TYPE NAME	character	20	Yes	The name of the type of location that is being summarized or rolled-up to, for acres or miles of land health in a percentage range format. Valid values: District Office, Administrative State Office



## Appendix D – Business Rule Details

### ***Business Rule 2: Key for Conflicting Reporting Categories***

Key for assigning a land health reporting category to an area, for a land health fundamental, when more than one land health standard conforms to the fundamental (in other words, overlapping polygons or line features associated with overlapping land health standard themes, and land health reporting categories are different across themes). The key is designed in such a way that it must be followed sequentially from step 1a onward.

<b>1a.</b>	If land health reporting category 4 is present, alone or in any combination with reporting categories 1, 2a, 2b, 2c, 2d, 2e, 2f, or 3, land health reporting category 4 is assigned.
<b>1b.</b>	If land health reporting category 4 is not present, go to 2a.
<b>2a.</b>	If land health reporting category 2d is present, alone or in any combination with reporting categories 1, 2a, 2b, 2c, 2e, 2f, or 3, land health reporting category 2d is assigned.
<b>2b.</b>	If land health reporting category 2d is not present, go to 3a.
<b>3a.</b>	If land health reporting category 2c is present, alone or in any combination with reporting categories 1, 2a, 2b, 2e, 2f, or 3, land health reporting category 2c is assigned.
<b>3b.</b>	If land health reporting category 2c is not present, go to 4a.
<b>4a.</b>	If land health reporting category 2b is present, alone or in any combination with reporting categories 1, 2a, 2e, 2f, or 3, land health reporting category 2b is assigned.
<b>4b.</b>	If land health reporting category 2b is not present, go to 5a.
<b>5a.</b>	If land health reporting category 2a is present, alone or in any combination with reporting categories 1, 2e, 2f, or 3, land health reporting category 2a is assigned.
<b>5b.</b>	If land health reporting category 2a is not present, go to 6a.
<b>6a.</b>	If land health reporting category 2e is present, alone or in any combination with reporting categories 1, 2f, or 3, land health reporting category 2e is assigned.
<b>6b.</b>	If land health reporting category 2e is not present, go to 7a.
<b>7a.</b>	If land health reporting category 2f is present, alone or in any combination with reporting categories 1 or 3, land health reporting category 2f is assigned.
<b>7b.</b>	If land health reporting category 2f is not present, go to 8a.
<b>8a.</b>	land health reporting category 1 is present, alone or in combination with reporting category 3, land health reporting category 1 is assigned.
<b>8b.</b>	If land health reporting category 1 is not present, land health reporting category 3 is present, and category 3 is assigned.

**Rationale**

This rationale section is intended to provide the reasons and the logic that support the assignment of LHR categories as described in the key.

Reporting category 4 trumps all other reporting categories because it represents a situation where an evaluation area has not yet been evaluated, for one or more land health standards that conform to a land health fundamental. In this situation, the land health fundamental has not been fully evaluated. Other reporting categories for land health cannot be assigned until the area has been evaluated for all land health standards that apply.

Non-achievement, if present, will always trump achievement. What this means is that any reporting category 2a, 2b, 2c, 2d, 2e, or 2f, will trump category 1.

Within the non-achievement categories 2a, 2b, 2c, 2d, 2e, and 2f, reporting category 2d represents a situation where one, or more than one, significant causal factor is known to be causing non-achievement, BLM is responsible for addressing the significant causal factor(s), yet BLM does not know what management actions would be implemented that would address the significant causal factor(s) to initiate significant progress toward achieving land health standard(s). This situation is the direst in regard to non-achieving.

Within the non-achievement categories 2a, 2b, 2c, 2e, and 2f, reporting category 2c represents a situation where one, or more than one, significant causal factor is known to be causing non-achievement, BLM is responsible for addressing the significant causal factor(s), and BLM anticipates implementing management actions that would address the significant causal factor(s) to initiate significant progress toward achieving land health standard(s). However, no actions have yet to be taken to change management in regard to the significant factors so no significant progress toward achieving the land health standards is being made.

Within the non-achievement categories 2a, 2b, 2e, and 2f, 2b represents a situation where significant causal factors have not yet been addressed by other landowner(s) besides BLM, through a management change. It represents a situation where improvement toward achieving the land health standard(s) is not yet occurring. In this regard it is a direr situation than reporting categories 2d or 2e. It is a situation similar to that of reporting category 2a, except BLM probably has a good idea of what the non-BLM factors are that are causing non-achievement, and implementing a fix in this situation is probably more difficult than under 2a because the fix is not under BLM control—therefore a direr situation than 2a, in which BLM does have some control.

Within the non-achievement categories 2a, 2e, and 2f, 2a represents the direst situation because no significant progress toward achieving the land health standard(s) is happening yet, and BLM does not yet have the knowledge of what is causing the non-achievement.

Within the non-achievement categories 2e and 2f, 2e represents a worse scenario in regard to land health because although in both 2e and 2f, BLM has made a management change to address significant causal factor(s), in 2e BLM does not yet know if significant progress toward achieving the land health standard(s) is occurring or not.

Achievement, if present, will always trump “standard does not apply”. What this means is that category 1 will always trump category 3.

### ***Business Rule 3: Reporting Land Health Equations***

For each equation result, go to 3 decimal places. When the digit 5, 6, 7, 8, or 9 appears in the 4th decimal place, round up; when the digit 0, 1, 2, 3, or 4 appears in the 4th decimal place, round down.

#### **DISTRICT OFFICE EQUATIONS**

For each District Office, the actual percentages to be used are calculated for public land achieving, and public land not achieving (including each of its subcategories), for each land health standard. Here are the equations to be used:

\* \* \* \* \*

Use the following for the BASE denominator in district office calculations, which subtracts those acres/miles where the standard does not apply, and those acres/miles that are not yet evaluated, from the district office's total BLM acres/miles.

District Office Total Evaluated To Date (Base Denominator) =  
 (Total BLM Acres or Miles in the District Office) - (total acres/miles in Category 3 + Category 4)

\* \* \* \*

For Public Land Achieving, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 1}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 2a + 2b + 2c + 2d + 2e + 2f}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Significant Factor is Undetermined, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 2a}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Significant Factor is non-BLM or Not BLM Authorized, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 2b}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current Management affects Land Health, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 2c}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current management affects Land Health – but ways to achieve progress unknown, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 2d}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current Management Changed—Significant Factors Addressed—To Result in Significant Progress toward Achieving, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 2e}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current Management is Appropriate--Monitoring Data Indicate Making Significant Progress Toward Achieving, for each District Office, calculate this equation separately for each Land Health Standard:

$$\frac{\text{Total acres or miles in Category 2f}}{\text{District Office Total Evaluated to Date (Base Denominator)}}$$

#### **ADMINISTRATIVE STATE OFFICE EQUATIONS**

For each Administrative State Office, the actual percentages to be used are calculated for public land achieving, and public land not achieving (including each of its subcategories), for each land health fundamental. Here are the equations to be used:

\*\*\*\*\*

Use the following for the BASE denominator in administrative state office calculations, which subtracts those acres/miles where the standard does not apply, and those acres/miles that are not yet evaluated, from the district office's total BLM acres/miles.

$$\text{Admin State Office Total Evaluated to Date (Base Denominator)-} = (\text{Total BLM Acres or Miles in the State office}) - (\text{total acres/miles in Category 3} + \text{Category 4})$$

\*\*\*\*

For Public Land Achieving, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental:

$$\frac{\text{Total acres or miles in Category 1}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental:

$$\frac{\text{Total acres or miles in Category 2a} + \text{2b} + \text{2c} + \text{2d} + \text{2e} + \text{2f}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Significant Factor is Undetermined, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental:

$$\frac{\text{Total acres or miles in Category 2a}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Significant Factor is non-BLM or Not BLM Authorized, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental :

$$\frac{\text{Total acres or miles in Category 2b}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current Management affects Land Health, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental:

$$\frac{\text{Total acres or miles in Category 2c}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current management affects Land Health – but ways to achieve progress unknown, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental:

$$\frac{\text{Total acres or miles in Category 2d}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current Management Changed--Significant Factors Addressed--To Result in Significant Progress Toward Achieving, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental:

$$\frac{\text{Total acres or miles in Category 2e}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

For Public Land Not Achieving: Current Management is Appropriate--Monitoring Data Indicate Making Significant Progress Toward Achieving, for each Administrative State Office, calculate this equation separately for each Land Health Fundamental:

$$\frac{\text{Total acres or miles in Category 2f}}{\text{Admin State Office Total Evaluated to Date (Base Denominator)}}$$

### **Business Rule 4: Reporting Category Selection Rationale**

The following documents which land health reporting category is appropriate to use.

LH_RPT CTGY	LHRC_NM	Rationale
1	Public Land Achieving	<p>A land health standard is being achieved.</p> <p>This reporting category would be used for areas that have been identified as achieving a land health standard. An evaluation phase has to be completed for areas to be identified to this reporting category.</p>
2a	Public Land Not Achieving - Significant Factor is Undetermined	<p>A land health standard is not being achieved and it is not known why it is not being achieved.</p> <p>This reporting category relates to situations where a land health evaluation has been completed to ascertain if each land health standard has been achieved or not, yet in the areas identified as non-achieving, the significant factor(s) has (have) not yet been determined. A reason for this could be a lack of data sufficient to identify a significant factor(s). The intent is not to keep areas in this category for perpetuity. An evaluation phase has to be completed for areas to be identified to this reporting category.</p>
2b	Public Land Not Achieving - Significant Factor is non-BLM or Not BLM Authorized	<p>A land health standard is not being achieved, BLM knows what is causing the non-achievement, and it is not BLM's fault.</p> <p>This reporting category relates to situations where a land health evaluation has been completed to ascertain if each land health standard has been achieved or not, yet in the areas identified as non-achieving, the significant factor(s) are attributable to landowners besides BLM (for example, private, State, Forest Service, BIA), or, the significant factor(s) are not BLM authorized. If there is more than one significant factor operating, every significant factor must be non-BLM or not BLM authorized, for the areas to be placed in this category. An example is a land health evaluation for a water quality land health standard in which stream segments are listed as 303d, because of water temperature non-compliance. Timber management (silvicultural practices) up-stream from BLM, on other ownership, is causing lack of shade sufficient to create exceedance of the water temperature water quality parameter. Waters flowing across BLM land exceed the temperature parameter but the significant factor is non-BLM. Another example is trespass livestock in an allotment, or unauthorized OHV activity in a designated wilderness area, as examples of not BLM authorized. A determination phase has to be completed for areas to be identified to this reporting category.</p> <p>Significant factors are available in a pick-list (domain: Significant Factor Name) and all are selectable, except for the 'Exempt from achieving land health in LUP' as spatial attributes associated with the mapped area. More than one significant factor can be selected for any given area mapped as being non-achieving.</p>

2c	Public Land Not Achieving - Current Management or Disturbances Affect Land Health	<p>A land health standard is not being achieved and the causes of the non-achievement are under BLM's control and no actions have been taken yet on the causes of non-achievement.</p> <p>This reporting category relates to situations where a land health evaluation has been completed to ascertain if each land health standard has been achieved or not, yet in the areas identified as non-achieving, the significant factor(s) is (are) known and are attributable to current management by BLM or disturbances that are operating outside the natural range of variability. Current management typically is defined as management that is currently authorized by BLM. A disturbance example would be situations where vegetation treatment is needed to improve land health but has yet to be implemented—an example here is tree encroachment (for example by western juniper, pinon pine, or Douglas-fir) into a shrubland or grassland that is not caused by any activity or use but could be caused by lack of fire. A determination phase has to be completed for areas to be identified to this reporting category.</p> <p>Significant factors are available in a pick-list (domain: Significant Factor Name) and all are selectable as spatial attributes associated with the mapped area. More than one significant factor can be selected for any given area mapped as being non-achieving.</p>
2d	Public Land Not Achieving – Current management or disturbances affect land health, but ways to achieve significant progress are unknown	<p>A land health standard is not being achieved and the causes of the non-achievement are under BLM's control but ways to treat the causes and improve conditions are not known, are too costly to implement, or are not feasible with present technology.</p> <p>This reporting category relates to situations where a land health evaluation has been completed to ascertain if each land health standard has been achieved or not, yet in the areas identified as non-achieving, current management or disturbances operating outside the natural range of variability, that have caused the non-achievement are known, but ways to change the current management or disturbances to result in significant progress toward achieving, are unknown. An example here is cheatgrass-dominated vegetation on very xeric rangeland, say in a 6 to 8 inch annual precipitation zone; the significant factors are likely to be wildfire and weeds, yet there are not one or a combination of techniques that can be used successfully to restore these areas to functioning to a point where they achieve land health standards. A determination phase has to be completed for areas to be identified to this reporting category.</p> <p>Significant factors are available in a pick-list (domain: Significant Factor Name) and all are selectable, except for the 'Exempt from achieving land health in LUP' as spatial attributes associated with the mapped area. More than one significant factor can be selected for any given area mapped as being non-achieving.</p>

2e	Public Land Not Achieving- Current management or disturbances changed – significant factors addressed-to result in significant progress toward achieving	<p>A land health standard is not being achieved, the causes of the non-achievement are under BLM's control, and BLM has taken action on those causes with the intent of achieving significant progress toward achieving the standard.</p> <p>This reporting category relates to situations where a land health evaluation has been completed to ascertain if each land health standard has been achieved or not, yet in the areas identified as non-achieving, current management or disturbances that have caused the non-achievement have been changed, and were done so to result in significant progress toward achieving the land health standard. BLM does not yet know if actual significant progress toward achieving the land health standard is occurring. Rather, this category reflects that BLM made management change(s) that is (are) anticipated to result in significant progress toward achieving the land health standard. This category accommodates situations where there are areas that might remain relatively unchanged for relatively long periods of time, for example: 1) rangeland dominated by blue grama that perhaps is not achieving a habitat quality land health standard and where livestock grazing management has been a significant factor and has been changed—many years might be necessary to detect measurable change (significant progress); 2) xeric rangeland dominated by salt desert shrub vegetation that is not achieving an upland watershed function land health standard because of livestock grazing that has removed too much herbaceous vegetation which has resulted in excessive wind erosion. Current seeding technology is not deemed adequate to result in plant species composition improvement because of the extreme aridity of the area. Livestock grazing management has been changed to result in significant progress toward achieving the land health standard but there is an unknown likelihood of success. A grazing decision or record of decision changing authorized activities must have been issued for areas to be identified to this reporting category.</p> <p>Significant factors are available in a pick-list (domain: Significant Factor Name) and all are selectable, except for the 'Exempt from achieving land health in LUP' as spatial attributes associated with the mapped area. More than one significant factor can be selected for any given area mapped as being non-achieving. In this instance the significant factors selected will be those that BLM addressed with management changes.</p>
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2f	Public Land Not Achieving- Current management or disturbances are appropriate – monitoring data indicate making significant progress toward achieving	<p>A land health standard is not being achieved, BLM has taken action on the causes of the non-achievement, and BLM has monitoring data that shows that the action(s) taken are making significant progress (upward trend) toward achieving the standard.</p> <p>This reporting category relates to situations where, in the areas identified as non-achieving, current management or disturbances that have caused the non-achievement have been changed, and monitoring data actually provide evidence that significant progress (upward trend) is being made toward achieving the land health standard. As soon as monitoring data show achievement of the land health standard, areas identified to this category will be moved to category 1—Public Land Achieving. A grazing decision or record of decision changing authorized activities must have been issued for areas to be identified to this reporting category.</p>
3	Public Land Where Standard Does not Apply	<p>This reporting category relates to acres or miles within an evaluation area, where the land health standard does not apply. For example, an upland soils land health standard may not apply to the riparian areas, in which case the acreage associated with the riparian areas within the evaluation area would be placed into this reporting category. Do not interpret this reporting category to represent areas that are not grazed by livestock—land health standards apply to grazed as well as ungrazed areas. An evaluation phase has to be completed for areas to be identified to this reporting category.</p>
4	Public Land Unevaluated	<p>This reporting category includes allotments, watersheds, or any other type of evaluation areas for which an evaluation report has not yet been completed.</p>

### **Business Rule 5: Land Health Reporting Category Progression and Rationale**

**Allowed and Unallowed Values for LHR Category Changes to Polygons or Line Features, from one time period to a future time period**

LHR Rpt Ctg - From	Land Health Reporting Category - Progression to								
	1	2a	2b	2c	2d	2e	2f	3	4
1		Y	Y	Y	Y				
2a			Y	Y	Y				
2b						Y			
2c						Y			
2d				Y		Y			
2e							Y		
2f	Y		Y	Y	Y				
3									
4	Y	Y	Y	Y	Y			Y	

#### Table Notes:

1. The table is interpreted from left to right. The Land Health Reporting Categories in the left-most field are rated as to whether they are allowed to change to the Land Health Reporting Categories in the remaining fields. For example, Land Health Reporting Category 1 in the left-most field is rated as to whether it is allowed to change to Land Health Reporting Category 1 in the 2<sup>nd</sup> field, Land Health Reporting Category 2a in the 3<sup>rd</sup> field, etc.
2. Cells in black solid cover are either: 1) Land Health Reporting Categories that remain the same from one time period to the next time period, and are therefore not changes; or 2) a rating of No, that the change is not allowed.
3. Cells with a Y represent a rating of Yes, that the change is allowed.

**Rationale for Land Health Reporting Category Progression**

Rationale for Progression from Land Health Reporting Category 1 ..... 44  
Rationale for Progression from Land Health Reporting Category 2a..... 45  
Rationale for Progression from Land Health Reporting Category 2b ..... 46  
Rationale for Progression from Land Health Reporting Category 2c..... 47  
Rationale for Progression from Land Health Reporting Category 2d ..... 48  
Rationale for Progression from Land Health Reporting Category 2e..... 49  
Rationale for Progression from Land Health Reporting Category 2f..... 50  
Rationale for Progression from Land Health Reporting Category 3 ..... 51  
Rationale for Progression from Land Health Reporting Category 4 ..... 52

### Rationale for Progression from Land Health Reporting Category 1

LHR Category	Allowed ?	Rationale
To Category 1	No	Cannot change from itself to itself.
To Category 2a	Yes	Areas achieving land health might not always stay achieving over time. Monitoring data should be collected on resource conditions on areas achieving land health as well as areas not achieving land health, and should resource conditions decline on areas achieving land health, it is possible for those areas to transition from achieving land health to not achieving land health.
To Category 2b	Yes	Areas achieving land health might not always stay achieving over time. Monitoring data should be collected on resource conditions on areas achieving land health as well as areas not achieving land health, and should resource conditions decline on areas achieving land health, it is possible for those areas to transition from achieving land health to not achieving land health.
To Category 2c	Yes	Areas achieving land health might not always stay achieving over time. Monitoring data should be collected on resource conditions on areas achieving land health as well as areas not achieving land health, and should resource conditions decline on areas achieving land health, it is possible for those areas to transition from achieving land health to not achieving land health.
To Category 2d	Yes	Areas achieving land health might not always stay achieving over time. Monitoring data should be collected on resource conditions on areas achieving land health as well as areas not achieving land health, and should resource conditions decline on areas achieving land health, it is possible for those areas to transition from achieving land health to not achieving land health.
To Category 2e	No	Cannot move directly from achieving land health to having changed current management or disturbances to address significant factors, without first having evaluated that land health is not being achieved.
To Category 2f	No	Cannot move directly from achieving land health to ascertaining that current management or disturbances are appropriate and significant progress toward achieving land health is occurring, without first having evaluated that land health is not being achieved.
To Category 3	No	Achieving land health means that the land health standard applies to that area; therefore it is not allowed to move from achieving land health to public land where land health standard does not apply.
To Category 4	No	Achieving land health means that the area has been evaluated for land health. Therefore not allowed to move from achieving land health to public land unevaluated

### Rationale for Progression from Land Health Reporting Category 2a

LHR Category	Allowed ?	Rationale
To Category 2a	No	Cannot change from itself to itself.
To Category 2b	Yes	It is certainly possible to move from not knowing what the significant causal factors are for not achieving land health, to know that the significant causal factors are non-BLM or not BLM-authorized.
To Category 2c	Yes	It is certainly possible to move from not knowing what the significant causal factors are for not achieving land health, to know that the significant causal factors are attributable to current management by BLM or disturbances that are operating outside the natural range of variability.
To Category 2d	Yes	It is certainly possible to move from not knowing what the significant causal factors are for not achieving land health, to know that the significant causal factors are attributable to current management by BLM or disturbances that are operating outside the natural range of variability yet ways to achieve significant progress are unknown.
To Category 2e	No	Cannot move directly from not knowing what the significant causal factors are for not achieving land health, to having changed current management or disturbances to address significant causal factors. Must first ascertain what the significant causal factors are for not achieving—conduct a determination phase.
To Category 2f	No	Cannot move directly from not knowing what the significant causal factors are for not achieving land health, to saying that changes made to current management or disturbances, are making significant progress toward achieving land health attributable to collected monitoring data. Must first ascertain what the significant causal factors are for not achieving—conduct a determination phase.
To Category 3	No	Ascertaining that land health is not being achieved yet the significant causal factors for not achieving are undetermined, means that the land health standard applies to the area.
To Category 4	No	Ascertaining that land health is not being achieved yet the significant causal factors for not achieving are undetermined, means that the area has been evaluated for land health.
To Category 1	No	The next step after ascertaining that land health is not being achieved yet the significant causal factors for not achieving are undetermined is to ascertain what the significant causal factors are—conduct a determination phase.

### Rationale for Progression from Land Health Reporting Category 2b

LHR Category	Allowed ?	Rationale
To Category 2b	No	Cannot change from itself to itself.
To Category 2c	No	Significant causal factors for not achieving land health have been identified as either non-BLM factors or not BLM-authorized factors during the determination phase of land health, and need to be dealt with. Significant causal factors attributable to current management by BLM or disturbances outside the natural range of variability have not been identified during the determination phase; if they had been identified then category 2c would have been identified rather than 2b.
To Category 2d	No	Significant causal factors for not achieving land health have been identified as either non-BLM factors or not BLM-authorized factors during the determination phase of land health, and need to be dealt with. Significant causal factors attributable to current management by BLM or disturbances outside the natural range of variability, without a way to achieve significant progress toward achieving land health, have not been identified during the determination phase; if they had been identified then category 2d would have been identified rather than 2b.
To Category 2e	Yes	It is possible that non-BLM or not BLM-authorized significant causal factors for not achieving land health have been changed-mitigated to result in significant progress toward achieving land health.
To Category 2f:	No	Cannot move directly from ascertaining that non-BLM or not BLM-authorized significant causal factors are causing non-achievement of land health, to saying that changes made to current management or disturbances, are making significant progress toward achieving land health attributable to collected monitoring data. Must take next step first which is to make changes-mitigate the non-BLM or not BLM-authorized activities.
To Category 3	No	If it has been ascertained that land health is not being achieved attributable to non-BLM or not BLM-authorized factors, then this means that the land health standard applies to the area.
To Category 4	No	If it has been ascertained that land health is not being achieved attributable to non-BLM or not BLM-authorized factors, then this means that the area has undergone a land health evaluation.
To Category 1	No	An area that has been ascertained to be not achieving land health attributable to non-BLM or not BLM-authorized factors needs to undergo the next step which is to change-mitigate those factors to result in significant progress toward achieving land health.
To Category 2a	No	If it has been ascertained that non-BLM or not BLM-authorized activities are significant causal factors in not achieving land health that means that the significant causal factors have been determined. Therefore once the significant causal factors are known it does not make sense to then say they are undetermined.

### Rationale for Progression from Land Health Reporting Category 2c

LHR Category	Allowed ?	Rationale
To Category 2c	No	Cannot change from itself to itself.
To Category 2d	No	Category 2d represents situations where BLM knows that the significant causal factors for not achieving are attributable to current management by BLM or to disturbances outside the natural range of variability, and that from past experiences trying to change-mitigate these factors or from experiences of others perhaps published scientific studies, that ways to change-mitigate these factors to achieve significant progress toward achieving are unknown. Changing from 2c to 2d is not allowed because in 2c, BLM has ideas of what to try, to change-mitigate the significant causal factors, and needs to take the next step and implement these changes.
To Category 2e	Yes	This would represent situations where BLM has implemented changes to current management or to disturbances outside the natural range of variability, to result in significant progress toward achieving.
To Category 2f	No	Changing the current management of BLM or the disturbances operating outside the natural range of variability, must be done first, before it can be said that monitoring data are showing that the changes are making significant progress toward achieving land health.
To Category 3	No	If it is ascertained that current management by BLM or disturbances operating outside the natural range of variability are causing non-achievement of land health, that means that the land health standard is applicable to that area.
To Category 4	No	If it is ascertained that current management by BLM or disturbances operating outside the natural range of variability are causing non-achievement of land health, that means that a land health evaluation has been conducted for the area.
To Category 1	No	Cannot say that land health is not being achieved, and the significant causal factors are known that are causing non-achievement, and then go right to saying that land health is being achieved. First would have to implement changes-mitigation to the significant causal factors that are causing non-achievement.
To Category 2a	No	Cannot say that land health is not being achieved, and the significant causal factors are known that are causing non-achievement, and then go right to saying that the significant causal factors causing the non-achievement are undetermined. First should implement changes-mitigation to the significant causal factors causing non-achievement.
To Category 2b	No	Cannot say that current management by BLM or disturbances operating outside the natural range of variability are causing non-achievement of land health, and then go directly to saying that non-BLM factors or not BLM-authorized factors are causing non-achievement of land health. Even if non-BLM factors or not BLM-authorized factors start becoming problematic on the area after it was determined that current management by BLM or disturbances were significant causal factors, the current management by BLM or disturbances must be dealt with first through implementing changes to result in significant progress toward achieving.

### Rationale for Progression from Land Health Reporting Category 2d

LHR Category	Allowed ?	Rationale
To Category 2d	No	Cannot change from itself to itself.
To Category 2e	No	Allowed change. If BLM finds ways to change current management or disturbances that are believed will result in significant progress toward achieving land health, and those changes are implemented, then it is possible to move from category 2d to 2e.
To Category 2f	No	Cannot move directly from 2d to 2f without first implementing some kind of change to current management or disturbances that are causing non-achievement of land health.
To Category 3	No	If current management or disturbances have been determined to be affecting land health but ways to achieve significant progress are unknown, that means that the area has been evaluated for a land health standard and the land health standard does apply to the area.
To Category 4:	No	The area has been evaluated for land health if it has been determined that land health is not being achieved attributable to current management or disturbances.
To Category 1	No	If it has been ascertained that land health is not being achieved and it is attributable to significant causal factors of current management by BLM or disturbances, and BLM has ascertained that ways to achieve significant progress toward achieving land health are unknown, then it cannot be said that land health is achieving on the area without first implementing some kind of changes to current management or disturbances.
To Category 2a	No	If it has been ascertained that land health is not being achieved and it is attributable to significant causal factors of current management by BLM or disturbances, and BLM has ascertained that ways to achieve significant progress toward achieving land health are unknown, then areas categorized this way cannot be then changed to say that land health is not being achieved and now it is not known what the significant causal factors are.
To Category 2b	No	To change from 2d to 2b, all significant causal factors causing non-achievement of land health must be either non-BLM or not BLM-authorized factors. And it has already been ascertained in 2d that they are not all non-BLM or not BLM-authorized factors; rather the significant causal factors are current management by BLM or disturbances.
To Category 2c	Yes	It could happen that BLM discovers ways to change current management or disturbances to result in significant progress toward achieving land health, and if so, category 2d could change to 2c. This change would happen before BLM actually starts implementing the changes to current management or disturbances.



### Rationale for Progression from Land Health Reporting Category 2e

LHR Category	Allowed ?	Rationale
To Category 2e	No	Cannot change from itself to itself.
To Category 2f	Yes	After current management or disturbances are changed to result in significant progress toward achieving land health, monitoring data can provide evidence that significant progress toward achieving land health is actually occurring. If this happens then this change from 2e to 2f is possible.
To Category 3	No	Categorizing an area to category 2e means that the land health standard does apply to the area.
To Category 4	No	Categorizing an area to category 2e means that the area has been evaluated for land health.
To Category 1	No	An area identified to category 2e is not achieving land health and needs to, or is, undergoing monitoring to ascertain if significant progress toward achieving land health is occurring. Cannot say that the area is achieving land health without first providing evidence through monitoring that significant progress toward achieving land health is occurring.
To Category 2a	No	An area identified to category 2e has already had significant causal factors identified for it, and actions have been implemented to address those significant causal factors to try to result in significant progress toward achieving land health. Cannot go from this situation to saying that the area is not achieving and we do not know what the significant causal factors are that are causing the non-achievement.
To Category 2b	No	An area identified to category 2e has already had changes-mitigative actions implemented to address significant causal factors that are causing non-achievement of land health. Going from this situation to category 2b would be going back in time and would not be allowing time for the corrective actions to the significant causal factors to operate to see if significant progress toward achieving land health is taking place.
To Category 2c:	No	An area identified to category 2e has already had changes-mitigative actions implemented to address significant causal factors that are causing non-achievement of land health. Going from this situation to category 2c would be going back in time and would not be allowing time for the corrective actions to the significant causal factors to operate to see if significant progress toward achieving land health is taking place.
To Category 2d	No	An area identified to category 2e has already had changes-mitigative actions implemented to address significant causal factors that are causing non-achievement of land health, which means that BLM believes that there are ways to change-mitigate the significant causal factors to achieve significant progress toward land health. Next step is to implement monitoring to ascertain if significant progress toward achieving land health is occurring attributable to the changes-mitigation that was implemented.

### Rationale for Progression from Land Health Reporting Category 2f

LHR Category	Allowed ?	Rationale
To Category 2f	No	Cannot change from itself to itself.
To Category 3	No	Areas identified to category 2f have already been evaluated for a land health standard and therefore it cannot be said that the land health standard does not apply to the area.
To Category 4	No	Areas identified to category 2f have already been evaluated for a land health standard and therefore it cannot be said that the area has not been evaluated for land health.
To Category 1	Yes	The natural progression is for areas identified to category 2f to move to category 1, after monitoring data have indicated that the land health standard is being achieved.
To Category 2a	No	Areas identified to category 2f have already undergone a determination that has identified what the significant causal factors are that are causing non-achievement of land health. Changing this situation to category 2a would be moving back in time and saying that we were incorrect in the significant causal factors we identified and now we say we don't know what the significant causal factors are. Highly unlikely for this situation to happen.
To Category 2b	Yes	It is possible that during the time that monitoring data are showing that significant progress toward achieving land health is occurring, newly operating non-BLM or not BLM-authorized significant causal factors occur, which could set the area back in land health and cause the area to move from category 2f to 2b.
To Category 2c	Yes	It is possible that during the time that monitoring data are showing that significant progress toward achieving land health is occurring, newly operating significant causal factors related to current management by BLM or disturbances occur, which could set the area back in land health and cause the area to move from category 2f to 2c.
To Category 2d	Yes	It is possible that during the time that monitoring data are showing that significant progress toward achieving land health is occurring, newly operating significant causal factors related to current management by BLM or disturbances occur, that BLM does not know how to mitigate, which could set the area back in land health and cause the area to move from category 2f to 2d
To Category 2e	No	Monitoring data are already showing that significant progress toward achieving land health is occurring , in areas identified to category 2f, and therefore for the area to move to category 2e would mean that the monitoring has not been initiated yet and we don't know if significant progress toward achieving land health is occurring or not.

### Rationale for Progression from Land Health Reporting Category 3

LHR Category	Allowed ?	Rationale
To Category 3	No	Cannot change from itself to itself.
To Category 4	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.
To Category 1	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.
To Category 2a	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.
To Category 2b	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.
To Category 2c	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.
To Category 2d	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.
To Category 2e	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.
To Category 2f	No	If an area is identified for which a land health standard does not apply, this means that that area has undergone a land health evaluation.

**Rationale for Progression from Land Health Reporting Category 4**

<b>LHR Category</b>	<b>Allowed ?</b>	<b>Rationale</b>
To Category 4	No	Cannot change from itself to itself.
To Category 1	Yes	An area identified as not having been evaluated for land health, can change to achieving land health after an evaluation has been conducted.
To Category 2a	Yes	An area identified as not having been evaluated for land health, can change to not achieving land health and significant causal factors are undetermined, after an evaluation has been conducted.
To Category 2b	Yes	An area identified as not having been evaluated for land health, can change to not achieving land health and significant causal factors are non-BLM or not BLM-authorized, after an evaluation and determination have been conducted.
To Category 2c	Yes	An area identified as not having been evaluated for land health, can change to not achieving land health and significant causal factors are current management by BLM or disturbances, after an evaluation and determination have been conducted.
To Category 2d	Yes	An area identified as not having been evaluated for land health, can change to not achieving land health and significant causal factors are current management by BLM or disturbances with BLM not knowing what to do to mitigate these causal factors, after an evaluation and determination have been conducted.
To Category 2e	No	Cannot skip directly from identifying an area as not having gone through a land health evaluation, to saying that the area has undergone an evaluation plus a determination plus changes-mitigation to the significant causal factors to result in significant progress toward achieving
To Category 2f	No	Cannot skip directly from identifying an area as not having gone through a land health evaluation, to saying that the area has undergone an evaluation plus a determination plus changes-mitigation to the significant causal factors to result in significant progress toward achieving plus monitoring data are present that indicates making significant progress toward achieving.
To Category 3	Yes	An area that has not been evaluated for land health can change and be identified as an area where a land health standard does not apply, after an evaluation has been conducted.