VMap base-level database (version 11)

Metadata:

Identification_Information:

Citation:

Citation_Information:

Originator: USDA Forest Service, Northern Region, Engineering, Geospatial Group

Publication_Date: April, 2011

Publication_Time: Unknown

Title:

VMap base-level database (version 11)

Geospatial_Data_Presentation_Form: digital data

Publication_Information:

Publication_Place: Missoula, MT

Publisher: USDA Forest Service, Northern Region, Engineering, Geospatial Group

Online_Linkage: http://www.fs.fed.us/r1/gis/VMapWebPage.htm

Description:

Abstract:

VMap is a multi-level, existing vegetation geospatial database used to produce four primary map products; lifeform, tree canopy cover class, tree diameter, and tree dominance type. Additional add-ons to the database are included for Eastside forests to address non-forest map classes (e.g., grassland and shrubland dominance types, shrub canopy cover, and non-forest litter). The VMap database can produce products to meet information needs at various levels of analysis according to National and Regional direction established by the Existing Vegetation Classification and Mapping Technical Guide (Brohman and Bryant, 2005) and the Region 1 Multi-level Classification, Mapping, Inventory, and Analysis System (Berglund and others, 2009). This feature class (VMap_Base) is to be used at base-levels (e.g., landscapes, projects) of analysis and contains features at least 1 acre in size. The details of vegetation classification, base-level database development, and VMap accuracy assessment are included in a variety of documents posted on the VMap web site (http://www.fs.fed.us/r1/gis/VMapWebPage.htm).

Purpose:

This dataset was produced for use at project levels of analysis and planning (in some cases additional work would be needed for site specific or project level work.

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 04/23/11
Currentness_Reference:
publication date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -112.974015
East_Bounding_Coordinate: -111.003510
North_Bounding_Coordinate: 47.290333
South_Bounding_Coordinate: 46.072279
Keywords:
Theme:
Theme_Keyword_Thesaurus: satellite imagery
Theme_Keyword: Landsat 7
Theme_Keyword: R1-VMap
Theme_Keyword: eCognition
Theme_Keyword: lifeform
Theme_Keyword: tree dominance type
Theme_Keyword: tree canopy cover
Theme_Keyword: tree size
Theme_Keyword: hierarchical classification
Theme_Keyword: Biology, Ecology, and Biophysical
Place:
Place_Keyword: Northern Rockies
Access_Constraints: This dataset is in the public domain, and the recipient may not assert any proprietary rights thereto nor represent it to anyone as other than a dataset produced by the USDA Forest Service, Northern Region.
Use_Constraints:
The USDA Forest Service manages resource information and derived data as a service to USDA Forest Service users of digital geographic data. The USDA Forest Service is in no way condoning or endorsing the application of these data for any given purpose. It is the sole responsibility of the user to determine whether or not the data are suitable for the intended purpose. It is also the obligation of the user to apply those data in an appropriate and conscientious manner. The USDA Forest Service provides no warranty, nor accepts any liability occurring from any incorrect, incomplete, or misleading data, or from any incorrect, incomplete, or misleading use of these data.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Don Patterson

Contact_Organization: USDA Forest Service, Northern Region, Engineering, Geospatial Group
Contact_Position: Geospatial Services Group Leader
Contact_Address:
Address_Type: physical address
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200 East Broadway
City: Missoula
State_or_Province: MT
Postal_Code: 59802
Country: USA
Contact_Address:
Address_Type: mailing address
Address:
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City: Missoula
State_or_Province: MT
Postal_Code: 59807
Country: USA
Contact_Voice_Telephone: 406.329.3430
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Contact_Electronic_Mail_Address: dpatterson01@fs.fed.us
Hours_of_Service: Monday-Friday, 8am-4:30 pm (MST)
Contact Instructions:
email preferred
Native_Data_Set_Environment:
Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.2.6.1500

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Data_Quality_Information:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
<15 meters
Quantitative_Horizontal_Positional_Accuracy_Assessment:
Horizontal_Positional_Accuracy_Value: 15
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Title:
Orthorectified NAIP data (imagery)
Type_of_Source_Media: CD-ROM
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:

Calendar_Date: July & August/2009
Source_Currentness_Reference:
ground condition
Source_Citation_Abbreviation:
summer imagery
Source_Contribution:
These are the four channel NAIP image data.
Source_Information:
Source_Citation:
Citation_Information:
Title:
Orthorectified path level TM data (imagery)
Type_of_Source_Media: CD-ROM
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: August & September/2009
Source_Currentness_Reference:
ground condition
Source_Citation_Abbreviation:
summer imagery
Source_Contribution:
These are the six channel TM image data that have been calibrated to exo-atmospheric reflectance to account for between scene variation in sun angle and solar elevation. These data provided the base imagery for the image segmentation, vegetation indices, and Kauth-Thomas Tassel-Cap transformations. This was the "peak greenness" imagery, upon which, the change detection was based.
Source_Information:
Source_Citation:
Citation_Information:
Title:
Kauth-Thomas Tassel-Cap (TC) Transformations
Source_Citation_Abbreviation:
brightness, greenness, wetness
Source_Contribution:
The TC is a linear transformation of the reflectance calculated TM data that rotates the data structure such that the majority of the information contained in the 6 bands will occupy 3 dimensions that are directly related to the on-the-ground physical scene characteristics. These dimensions define planes of soils (brightness), vegetation (greenness), and a transitional zone that relates to canopy and soil moisture (wetness). These three dimensions capture 97%+ of the data variation in the 6 TM bands and can enable the discernment of key forest attributes (i.e., species, age, and structure).
Source_Information:
Source_Citation:
Citation_Information:
Title:

Normalized Difference Vegetation Index
Source_Citation_Abbreviation:
NDVI
Source_Contribution:
The Normalized Difference Vegetation Index (NDVI) is calculated as the normalized difference between the NIR and the Red bands (NIR - R)/(NIR + R). The NDVI is probably the most widely used vegetation index and has been shown to be related to a number of different biomass variables. Simple vegetation indices such as NDVI, however, provide an inadequate representation of complex vegetation cover as they are related only to the total amount of above-ground green leaf biomass, and give no indication of the types of vegetation present. Vegetated areas will generally yield a higher NDVI value than rock, which will have values greater than that of clouds, snow, and water. The 5meter NAIP imagery was used for the NDVI where applicable. In other cases, NDVI was calculated for the Landsat TM imagery was used.
Source_Information:
Source_Citation:
Citation_Information:
Title:
Solar-radiation aspect index
Source_Citation_Abbreviation:
TRASP
Source_Contribution:
TRASP was used as a biophysical predictor to create a Whitebark pine probability surface for input into eCognition for the Gallatin NF portion of the VMap and also for some of the non-forest classes (see Random Forest.) The circular aspect variable is transformed to a radiation index (TRASP.) This transformation assigns a value of zero to land oriented in a north-northeast direction, (typically the coolest and wettest orientation), and a value of one on the hotter, dryer south-southwesterly slopes. The result is a continuous variable between 0 - 1 (Robert and Cooper 1989).TRASP=(1 - cos((pi / 180)(aspect - 30)))/2
Source_Information:
Source_Citation:
Citation_Information:
Title:
Compound Topographic Index
Source_Citation_Abbreviation:
CTI
Source_Contribution:
The Compound Topographic Index (CTI) was used as a biophysical predictor to create a Whitebark pine probability surface for input into eCognition for the Gallatin NF portion of the VMap and also for some of the non-forest classes (see Random Forest.) CTI is a steady state wetness index. The CTI is a function of both the slope and the upstream contributing area per unit width orthigonal to the flow direction. CTI was desigined for hillslope catenas. Accumulation numbers in flat areas will be very large and CTI will not be a relevant variable. CTI is highly correlated with several soil attributes such as horizon depth(r=0.55), silt percentage(r=0.61), organic matter content(r=0.57),

and phosphorus(r=0.53) (Moore et al. 1993).The implementation of CTI can be shown as: CTI = ln (As / (tan (beta)) where As = Area Value calculated as(flow accumulation + 1) * (pixel area in m2)and beta is the slope expressed in radians. The ArcInfo approach to calculating Flow Direction uses the D8 algorithm producing very unrealistic results. Several other methods are available for calculating flow directions. One of the more robust approaches is the D infinity algorithm (Tarboton 1997). There is a freeware download and documentation for TARDEM http://www.engineering.usu.edu/dtarb/ or TAUDEM http://moose.cee.usu.edu/taudem/taudem.html. The derivative of the FLOWDIRECTION calculation from either of these two programs can be used in the CTI AML or you can calculate FLOWDIRECTION in GRID.

Source_Information:

Source_Citation:

Citation_Information:

Title:

10m Digital Elevation Model

Type_of_Source_Media: 10m NED

Source_Citation_Abbreviation:

DEM

Source_Contribution:

This layer contains the elevation information for each sub-path model. Illumination, slope and aspect were derived from the DEM.

Source_Information:

Source_Citation:

Citation_Information:

Title:

Solar Radiation Index

Source_Citation_Abbreviation:

Solar Radiation

Source_Contribution:

Derived from the 10 meter DEM using ArcGISs Spatial Analyst function. The raster created is the global radiation or total amount of incoming solar insolation (direct and diffuse) calculated for each location of the input DEM for one year. The output has unit watt hours per square meter (WH/m2). This surface was used as a biophysical predictor to create a Whitebark pine probability surface for input into eCognition for the Gallatin NF portion of the VMap and also for some of the non-forest classes (see Random Forest).

Source_Information:

Source_Citation:

Citation_Information:

Title:

Random Forest Predictions

Source_Citation_Abbreviation:

Random Forest

Source_Contribution:

In machine learning, a random forest is a classifier that consists of many decision trees and outputs the class that is the mode of the classes output by individual trees. The algorithm for inducing a random forest was developed by Leo Breiman and Adele Cutler, and "Random

Forests" is their trademark. The term came from random decision forests that was first proposed by Tin Kam Ho of Bell Labs in 1995. The method combines Breiman's "bagging" idea and Ho's "random subspace method" to construct a collection of decision trees with controlled variations. The Random Forests classifier is part of the open source statistical package R. The USDA Remote Sensing Applications Center created a CartTools Pythogn program script (contact Bonnie Ruefenacht for the latest version of this script 801-975-3828) which accesses Rs Random Forest to create prediction surfaces. This script was used to create additional non-forest class predictions. The Mid-level non-forest classes predicted with Random Forests include grass-bunch, grass-single-stem; the litter classes litter>90%, litter 60-89.9%, litter < 60%; and the xeric-shrub canopy classes xeric shrub10-24.9%, and xeric shrub > 25%.

Source_Information:
Source_Citation:
Citation_Information:
Title:
Generalized Additive Model Prediction
Source_Citation_Abbreviation:
GAM
Source_Contribution:
In statistics, the generalized additive model (or GAM) is a statistical model developed by Trevor Hastie and Rob Tibshirani for blending properties of generalized linear models with additive models. This surface was used as a biophysical predictor to create a Whitebark pine probability surface for input into eCognition for the Gallatin NF portion of the VMap. The Whitebark probability surface was created using the statistical package R version 2.72 with a General Additive Model (GAM).

Source_Information:
Source_Citation:
Citation_Information:
Title:
Combined Slope and Aspect
Source_Citation_Abbreviation:
EWSLP/NSSLP
Source_Contribution:
These layers are transformations of the DEM derivatives of aspect and percent slope that combines the information into single files for east/west (ewslp) and north/south (nsslp), respectively. These data have had a zonal majority calculated based on the z-grid for each sub-path model so that there is a unique value retained for each image object.

Source_Information:
Source_Citation:
Citation_Information:
Title:
Texture image bands
Source_Citation_Abbreviation:
Texture

Source_Contribution:
A series of calculations of texture were created from the color infrared NAIP imagery and used in the eCognition segmentation and map classification. Texture calculates a variance (minimum, mean) from an adaptive window around each pixel as its measure of texture. The resulting texture image or band is a composite of minimum variance values calculated for each pixel. Two sets of three banded texture images were created using these focal windows and parameters: The first three banded image was created from 1m NAIP using a minimum variance and focal windows of (3x3), (5X5), and (9X9), then resampled back to 5meters; the second three banded texture image was created from 5m NAIP using a mean variance and focal windows of (3X3), (5X5) and (9x9).
Source_Information:
Source_Citation:
Citation_Information:
Title:
Model Boundary Data
Source_Citation_Abbreviation:
VMap model units
Source_Contribution:
VMap models for processing are based on general ecological or management units. They are restricted in size for better mapping precision and also to keep within the size limit restrictions of eCognition software.
Source_Information:
Source_Citation:
Citation_Information:
Title:
eCognition image object derived features
Source_Citation_Abbreviation:
BRIGHTNESS, MAX DIFF., RATIO, MIN, MAX, Standard Deviation
Source_Contribution:
Through the segmentation process, eCognition calculates a number of transformations and derivatives on the input data layers. For each image object a mean and standard deviation, of the values of the pixels contained within the boundaries that image object, is calculated for each input data layer. There are also three (3) eCognition features that are calculated on a subset of the input data layers, in this case the six (6) (CH 1-5, 7) channels of the "peak greenness" TM scene and three (3) (CH 1-3) of the color infrared NAIP imagery. The first feature is termed "BRIGHTNESS", which is the sum of the mean values of those six (6) layers divided by their quantity computed for an image object. The second feature is "Maximim Difference" (MAX DIFF.) , which is the sum of the mean values of those six (6) layers minus (-) the derived BRIGHTNESS value.
Source_Information:
Source_Citation:
Citation_Information:
Title:
Reference Data
Source_Citation_Abbreviation:

samples

Source_Contribution:

This is the photogrammetrically interepreted and ground survey based "ground truth" data employed to model the classification membership functions and to drive the Nearest Neighbor analysis.

Process_Step:

Process_Description:

The path-level LandSAT 5 TM data were ortho-rectified to the 1 meter color infrared NAIP imagery 2009 using the Ortho-Rectification Module and the Landsat orbit model in ERDAS Imagine 9.2 as well as 10 meter digital elevation models. A minimum of at least 50 ground control points (GCP) throughout each of the unrectified images. Actual rectification involved the Cubic convolution algorithm and a 30m pixel size. The resulting Root Mean Square (RMS) error was less than one pixel or 30 m.

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Process_Step:

Process_Description:

Path-level data subset to 13 map area regions based on the dissolved boundaries. Resample the 30m path level TM data to 5m resolution using ERDAS Imagine Cubic Convolution resampling technique.

Process_Step:

Process_Description:

Calculate minimum and mean texture images from NAIP imagery for each sub-model.

Process_Step:

Process_Description:

Create an eCognition "project" using the source data layers. Load the 12 TM layers, 12 tassel cap transformations and derivatives for the fall Landsat scenes, 12 Principal Component analysis 6 texture image derivatives the DEM, pnv layer, NDVI image, subpath model mask, illumination mask, and the aspect/slope combination layer.

Process_Step:

Process_Description:

Course level multiresolution segmentation using color infrared 5 meter NAIP imagery and texture band in eCognition software. Multiresolution segmentation is essentially a heuristic optimization procedure, which locally minimizes the average heterogeneity of image objects for a given resolution over the whole scene. Multiresolution segmentation is a method of generating image objects. It produces highly homogeneous segments in any chosen resolution, fitting your purpose. The resulting image segmentation, whose individual elements are referred to as image objects, can be universally applied to almost all data types. The image objects themselves, contain feature information based on the values of the pixels contained within the borders of each image object. These image object values are then used in the classification process, either through the use of fuzzy logic based membership functions or a Nearest neighbor analysis.

Process_Step:

Process_Description:

Sample data for each class in the classification schema is then loaded, or digitized, into the eCognition project. eCognition will then return a histogram for each feature and each sample base, which displays the spectral distribution of the samples over the range of the data feature chosen.

Process_Step:

Process_Description:

Compute a hierearchical classification based on fuzzy membership values calculated using the image object values computed through the multiresolution segmentation. The classification scheme first divides out water from non-water; then vegetated from non-vegetated; tree from herbaceous and shrub; shrub from herbaceous; 4 tree canopy cover classes from the tree dominated lifeform; 4 tree size classes from the tree dominated lifeform (using Nearest Neighbor analysis); and 8-12 dominance types (using a Nearest Neighbor analysis).

Process_Step:

Process_Description:

Compute classification of the Dry Grass type into two grass types (Bunch Grass and Single Stem Grass) using Random Forest alogrithm with field sample data and NAIP, Landsat, and Topographic variables.

Process_Step:

Process_Description:

Compute classification of the Dry Shrub type into two canopy cover classes using Random Forest alogrithm with field sample data and NAIP, Landsat, and Topographic variables.

Process_Step:

Process_Description:

Compute classification of Grass and Shrub lifeform types into two ground litter cover classes using Random Forest alogrithm with field sample data and NAIP, Landsat, and Topographic variables.

Process_Step:

Process_Description:

Final forest base level database was created by combining the 13 map area databases together and two map area databases from the 2009 Vmap m2901 and m2902 datasets.

Process_Step:

Process_Description:

Dissolved versions of the forest wide base level database were created for lifeform, tree canopy cover, tree diameter, and tree dominance type. A dissolve of tree canopy cover, tree diameter, tree dominance type combined was also created.

Process_Step:

Process_Description:

An accuracy assessment was provided for the four primary map products to quantify accuracy following four distinct lines of analytical logic. VMap accuracy assessment data are those polygons associated with the Forest Inventory Analysis (FIA) plot data. Summaries of the FIA plot data provide a means to achieve the most reliable dominance type and size determinations for each assessment reference polygon and can assist to some degree with canopy cover. The VMap accuracy assessment includes an area-weighted error matrix, which is based on the aerial extent of each class. The nature of errors in the classified map can, thus, be derived from the error matrix. A relatively recent innovation in accuracy assessment is the use of fuzzy sets for accuracy

assessments. Fuzzy logic is designed to handle ambiguity and, therefore, constitutes the basis for part of the VMap accuracy assessment. Instead of assessing a site as correct/incorrect as in a traditional assessment, an assessment using fuzzy sets can rate a site as absolutely wrong, reasonable or acceptable match, good match, or absolutely right. The resulting accuracy assessment can then rate the seriousness of errors as well as absolute correctness/incorrectness. For these reasons, the VMap accuracy assessment includes a fuzzy set-based error matrix and an area-weighted fuzzy set-based error matrix.

Process_Step:

Process_Description:

Metadata imported.

Source_Used_Citation_Abbreviation:

C:\DOCUME~1\cfisher\LOCALS~1\Temp\xmlD.tmp

Process_Date: 20110404

Process_Time: 09170300

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Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: G-polygon

Point_and_Vector_Object_Count: 500000+

Raster_Object_Information:

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Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: Albers Conical Equal Area

Albers_Conical_Equal_Area:

Standard_Parallel: 46.000000

Standard_Parallel: 48.000000

Longitude_of_Central_Meridian: -109.500000

Latitude_of_Projection_Origin: 44.000000

False_Easting: 600000.000000

False_Northing: 0.000000

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: row and column

Coordinate_Representation:

Abscissa_Resolution: 5.000000

Ordinate_Resolution: 5.000000

Planar_Distance_Units: meters

Geodetic_Model:

Horizontal_Datum_Name: North American Datum of 1983

Ellipsoid_Name: Geodetic Reference System 80

Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Vertical_Coordinate_System_Definition:
Altitude_System_Definition:
Altitude_Resolution: 0.000100
Altitude_Encoding_Method: Explicit elevation coordinate included with horizontal coordinates

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Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: VMap_Base
Attribute:
Attribute_Label: OBJECTID
Attribute_Definition:
Internal ESRI number
Attribute_Definition_Source:
ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: SHAPE
Attribute_Definition:
Internal ESRI number
Attribute_Definition_Source:
ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Coordinates defining the features.
Attribute:
Attribute_Label: MODEL
Attribute_Definition:
Unique Model map area name used in classification: m1601 (Long John mtns), m1602 (Flint mtns), m1701 (Pintler mtns), m1801 (Beaverhead mtns north), m1802 (Beaverhead mtns central), m2201 (Pioneer Mtns west), m2202 (Pioneer mtns east), m2301 (Deerlodge ne), m2302 (Homestake Pass), m2401 (Beaverhead mtns south), m2501 (Tabacco root mtns), m2601 (Snowcrest mtns), m2602 (Gravelly mtns), m2901 (Taylor-Hilgard mtns north 2009 vmap), m2902 (Taylor-Hilgard mtns south 2009 vmap)
Attribute:
Attribute_Label: GRID_CODE
Attribute_Definition:
Unique identifier for the polygon from segmentation process from each model.
Attribute:
Attribute_Label: VMAP_ID
Attribute_Definition:

Unique identifier for the polygon comprised of model map area name (MODEL) and polygon number (GRID_CODE) for example M1601-128 is a polygon from model map area M1601 and polygon number 128

Attribute:

Attribute_Label: ACRES

Attribute_Definition:

Area of the polygon in acres

Attribute:

Attribute_Label: LIFEFORM

Attribute_Definition:

Enumerated_Domain 3100 HERB - Herbaceous
Enumerated_Domain 3300 SHRUB - Shrubland
Enumerated_Domain 4000 TREE - Tree
Enumerated_Domain 5000 WATER - Water
Enumerated_Domain 7000 SPVEG - Sparsely Vegetated

Attribute:

Attribute_Label: DOM_MID_40

Attribute_Definition:

Enumerated_Domain 3160 GRASS-DRY - Dry grass
Enumerated_Domain 3190 GRASS-WET - Wet grass
Enumerated_Domain 3320 SHRUB-XERIC - Xeric shrub
Enumerated_Domain 3330 SHRUB-MESIC - Mesic shrub
Enumerated_Domain 5000 WATER - Water
Enumerated_Domain 7000 SPVEG - Sparsely vegetated
Enumerated_Domain 8015 MX-PIPO - Ponderosa pine dominated (>40% relative cover)
Enumerated_Domain 8025 MX-PSME - Douglas fir dominated (>40% relative cover)
Enumerated_Domain 8055 MX-PICO - Lodgepole pine dominated (>40% relative cover)
Enumerated_Domain 8065 MX-ABLA - Subalpine fir dominated (>40% relative cover)
Enumerated_Domain 8075 MX-PIEN - Englemann spruce dominated (>40% relative cover)
Enumerated_Domain 8125 MX-PIAL - Whitebark pine dominated (>40% relative cover)
Enumerated_Domain 8155 MX-PIFL2 - Limber pine dominated (>40% relative cover)
Enumerated_Domain 8165 MX-POPUL - Cottonwood dominated (>40% relative cover)
Enumerated_Domain 8175 MX-POTR5 - Aspen dominated (>40% relative cover)
Enumerated_Domain 8185 MX-JUNIP - Juniper dominated (>40% relative cover)
Enumerated_Domain 8400 IMIX - Shade-intolerant conifer mix (no single species >40% relative cover)
Enumerated_Domain 8500 TMIX - Shade-tolerant conifer mix (no single species >40% relative cover)
Enumerated_Domain 8600 HMIX - Hardwood mix (no single species >40% relative cover)

Attribute:

Attribute_Label: DOM_MID_60

Attribute_Definition:

Enumerated_Domain 3160 GRASS-DRY - Dry grass

Enumerated_Domain 3190 GRASS-WET - Wet grass
Enumerated_Domain 3320 SHRUB-XERIC - Xeric shrub
Enumerated_Domain 3330 SHRUB-MESIC - Mesic shrub
Enumerated_Domain 5000 WATER - Water
Enumerated_Domain 7000 SPVEG - Sparsely vegetated
Enumerated_Domain 8010 PIPO - Ponderosa pine dominated (>60% relative cover)
Enumerated_Domain 8020 PSME - Douglas fir dominated (>60% relative cover)
Enumerated_Domain 8050 PICO - Lodgepole pine dominated (>60% relative cover)
Enumerated_Domain 8060 ABLA - Subalpine fir dominated (>60% relative cover)
Enumerated_Domain 8070 PIEN - Englemann spruce dominated (>60% relative cover)
Enumerated_Domain 8120 PIAL - Whitebark pine dominated (>60% relative cover)
Enumerated_Domain 8150 PIFL2 - Limber pine dominated (>60% relative cover)
Enumerated_Domain 8160 POPUL - Cottonwood dominated (>60% relative cover)
Enumerated_Domain 8170 POTR5 - Aspen dominated (>60% relative cover)
Enumerated_Domain 8180 JUNIP - Juniper dominated (>60% relative cover)
Enumerated_Domain 8400 IMIX - Shade-intolerant conifer mix (no single species >60% relative cover)
Enumerated_Domain 8500 TMIX - Shade-tolerant conifer mix (no single species >60% relative cover)
Enumerated_Domain 8600 HMIX - Hardwood mix (no single species >60% relative cover)

Attribute:

Attribute_Label: DOM_GRP_6040

Attribute_Definition:

Enumerated_Domain 3170 GRASS-BUNCH - Bunchgrass
Enumerated_Domain 3180 GRASS-SINGLESTEM - Single-stem grass
Enumerated_Domain 3190 GRASS-WET - Wet grass
Enumerated_Domain 3320 SHRUB-XERIC - Xeric shrub
Enumerated_Domain 3330 SHRUB-MESIC - Mesic shrub
Enumerated_Domain 5000 WATER - Water
Enumerated_Domain 7000 SPVEG - Sparsely vegetated
Enumerated_Domain 8010 PIPO - Ponderosa pine dominated (>60% relative cover)
Enumerated_Domain 8013 PIPO-IMIX - Ponderosa pine intolerant conifer mix (>40% relative cover)
Enumerated_Domain 8020 PSME - Douglas fir dominated (>60% relative cover)
Enumerated_Domain 8023 PSME-IMIX - Douglas fir intolerant conifer mix (>40% relative cover)
Enumerated_Domain 8050 PICO - Lodgepole pine dominated (>60% relative cover)
Enumerated_Domain 8053 PICO-IMIX - Lodgepole pine intolerant conifer mix (>40% relative cover)
Enumerated_Domain 8054 PICO-TMIX - Lodgepole pine tolerant conifer mix (>40% relative cover)
Enumerated_Domain 8060 ABLA - Subalpine fir dominated (>60% relative cover)

Enumerated_Domain 8064 ABLA-TMIX - Subalpine fir tolerant conifer mix (>40% relative cover)
Enumerated_Domain 8070 PIEN - Englemann spruce dominated (>60% relative cover)
Enumerated_Domain 8074 PIEN-TMIX - Englemann spruce tolerant conifer mix (>40% relative cover)
Enumerated_Domain 8120 PIAL - Whitebark pine dominated (>60% relative cover)
Enumerated_Domain 8123 PIAL-IMIX - Whitebark pine intolerant conifer mix (>40% relative cover)
Enumerated_Domain 8150 PIFL2 - Limber pine dominated (>60% relative cover)
Enumerated_Domain 8153 PIFL2-IMIX - Limber pine intolerant conifer mix (>40% relative cover)
Enumerated_Domain 8160 POPUL - Cottonwood dominated (>60% relative cover)
Enumerated_Domain 8170 POTR5 - Aspen dominated (>60% relative cover)
Enumerated_Domain 8180 JUNIP - Juniper dominated (>60% relative cover)
Enumerated_Domain 8183 JUNIP-IMIX - Juniper intolerant conifer mix (>40% relative cover)
Enumerated_Domain 8400 IMIX - Shade-intolerant conifer mix (no single species >60% relative cover)
Enumerated_Domain 8500 TMIX - Shade-tolerant conifer mix (no single species >60% relative cover)
Enumerated_Domain 8600 HMIX - Hardwood mix (no single species >60% relative cover)

Attribute:

Attribute_Label: TREECANOPY

Attribute_Definition:

Enumerated_Domain 4001 CTR 10-24.9% - CTR 10-24.9%
Enumerated_Domain 4002 CTR 25-39.9% - CTR 25-39.9%
Enumerated_Domain 4003 CTR 40-59.9% - CTR 40-59.9%
Enumerated_Domain 4004 CTR >= 60% - CTR > 60%
Enumerated_Domain 3100 HERB - Herbaceous
Enumerated_Domain 3300 SHRUB - Shrub
Enumerated_Domain 5000 WATER - Water
Enumerated_Domain 7000 SPVEG - Sparsely vegetated
Enumerated_Domain 8600 TREE-DECID - Deciduous Tree

Attribute:

Attribute_Label: TREESIZE

Attribute_Definition:

Enumerated_Domain 4100 DBH 0-4.9" - Basal area weighted average diameter 0-4.9"
Enumerated_Domain 4200 DBH 5-9.9" - Basal area weighted average diameter 5-9.9"
Enumerated_Domain 4300 DBH 10-14.9" - Basal area weighted average diameter 10-14.9"
Enumerated_Domain 4400 DBH >= 15" - Basal area weighted average diameter > 15"
Enumerated_Domain 3100 HERB - Herbaceous
Enumerated_Domain 3300 SHRUB - Shrub
Enumerated_Domain 5000 WATER - Water
Enumerated_Domain 7000 SPVEG - Sparsely vegetated
Enumerated_Domain 8600 TREE-DECID - Deciduous Tree

Attribute:

Attribute_Label: ELEV
Attribute_Definition:
Average elevation of the polygon in meters
Attribute:
Attribute_Label: ASP_CLS
Attribute_Definition:
Enumerated_Domain FLAT - Flat (slope < 5%)
Enumerated_Domain N - North (338-360 & 0-22 degrees)
Enumerated_Domain NE - Northeast (23-68 degrees)
Enumerated_Domain E - East (68-112 degrees)
Enumerated_Domain SE - Southeast (113-157 degrees)
Enumerated_Domain S - South (158-202 degrees)
Enumerated_Domain SW - Southwest (203-247 degrees)
Enumerated_Domain W - West (248-292 degrees)
Enumerated_Domain NW - Northwest (293-337 degrees)
Attribute:
Attribute_Label: SLOPE
Attribute_Definition:
Average percent slope of the polygon
Attribute:
Attribute_Label: SHAPE_Length
Attribute_Definition:
Length of feature in internal units.
Attribute_Definition_Source:
ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Positive real numbers that are automatically generated.
Attribute:
Attribute_Label: SHAPE_Area
Attribute_Definition:
Area of feature in internal units squared.
Attribute_Definition_Source:
ESRI
Attribute_Domain_Values:
Unrepresentable_Domain:
Positive real numbers that are automatically generated.

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Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jim Barber
Contact_Organization: USDA Forest Service, Northern Region, Engineering, Geospatial Group
Contact_Position: GIS Specialist
Contact_Voice_Telephone: 406-329-3093
Contact_Facsimile_Telephone: 406-329-3199

Contact_Electronic_Mail_Address: jbarber@fs.fed.us
Hours_of_Service: M-F, 8am-4pm (MST)
Resource_Description: R1-VMap Dataset
Distribution_Liability:
The USDA Forest Service manages resource information and derived data as a service to USDA Forest Service users of digital geographic data. The USDA Forest Service is in no way condoning or endorsing the application of these data for any given purpose. It is the sole responsibility of the user to determine whether or not the data are suitable for the intended purpose. It is also the obligation of the user to apply those data in an appropriate and conscientious manner. The USDA Forest Service provides no warranty, nor accepts any liability occurring from any incorrect, incomplete, or misleading data, or from any incorrect, incomplete, or misleading use of these data.

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Metadata_Reference_Information:
Metadata_Date: 20090422
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: USDA Forest Service, Northern Region, Engineering, Geospatial Group
Contact_Person: Steve Brown
Contact_Position: Region 1 Remote Sensing Specialist
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Address_Type: mailing and physical address
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P.O. Box 7669
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State_or_Province: MT
Postal_Code: 59807
Country: USA
Contact_Address:
Address_Type: physical address
Address:
P.O. Box 7669
Address:
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City: Missoula
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Postal_Code: 59807
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Contact_Facsimile_Telephone: 406.329.3198
Contact_Electronic_Mail_Address: stevebrown@fs.fed.us
Hours_of_Service: M_F, 8am-4pm (MST)

Contact Instructions:
email preferred
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

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