Mapping of Forested Areas Within the Pinedale BLM Field Office Management Area

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Summary

Polygons representing some forest stands in the Bureau of Land Management (BLM) Pinedale management area were digitized from (28) 1:24,000-scale topographic maps. The polygons were drawn by hand by a BLM employee between 1988-1990 based on field observations. Polygons were not drawn for all forest stands in the BLM Pinedale management area. Thus, these data may not be appropriate for some applications. Paper maps were scanned, scanned images were georeferenced using ARC 8.1, and polygons were digitized on-screen using ArcView 3.2. The tic registration error of 96 percent of the maps is less than 11 meters. Total area occupied by each species and by timber type was calculated. Area occupied by different size classes and stocking rates was calculated for all stands and coniferous stands. Total amount of forested area digitized is over 19,000 hectares (47,000 acres).

Digital Map Creation

Paper maps

Polygons were hand-drawn on (29) 1:24,000-scale topographic maps from the Bureau of Land Management (BLM) Pinedale management area; three of these are duplicates. There were 2 sets of identical maps that had different forest stand polygons drawn on them, and in another case, there was a duplicate map on which the polygons were identical. Maps with different information were merged into one coverage, so the total digitized area covered 26 separate maps (Figure 1). The polygons were drawn by a BLM employee during 1988-1990 based on field observations. Stand attribute information recorded for polygons includes timber type (composed of tree species, size class, and stocking density) and an identification number.

Georeferencing maps

Maps were stored in a large hard-bound book. In order to fit maps inside the hardbound covers, the margins of the topos, including scale and projection information, were at some time cut off. The scale information was taped to the topos; the projection information was not. By comparing a subset of the 26 maps to intact topos, we found that there were at least three different projections among the different maps. Given time constraints, it was impractical to

attempt to visually compare the topos in hand with different versions of the same topos to ascertain the projection of each topo. In any case, it may not have always been possible to confidently determine the projection through visual comparison. As a result, all the topos were 'forced' into the UTM projection. This was done by noting the latitude and longitude of each corner of the maps. The latitude and longitude coordinates were then converted to decimal degrees, and then to UTMs. To determine the appropriate minimum scanning resolution of the maps, a subset of maps were scanned at 400, 600, and 800 dpi and compared. Resolution of 400 dpi was judged to be sufficient. All maps were then scanned at 400 dpi. Scanned maps were registered on-screen using UTM coordinates in ARC 8.1 (ESRI Redlands, California), then transformed and rectified in ARC 8.1.

Error estimates

The tic registration error (Root Mean Square error) for each map is listed in Table 1. The tic registration error is the distance between the true geographic location of a point and the location manually entered during the registration process measured in coverage units (meters in this case). Error estimates were generated for each of the four corners of each map. The estimates shown in Table 1 are the average of the four corners; error may be less or more in different parts of the map. The tic registration error of 96 percent of the maps is less than 11 meters. One map had relatively high image error (29.72 meters), which may be due at least in part to the initial projection of the map. The scanned, georeferenced map images were overlain on topographic quad boundaries in ArcView 3.2 to detect any obvious georeferencing errors.

Additional error is attributable to error in the base maps (topographic maps), the width of the felt-tipped pen lines drawn to delineate different stands, and misalignment of borders of polygons that span two topo maps. Polygons were hand-drawn on USGS 1:24,000-scale topographic maps, which have an error of +/- 40 feet (about 12.2 meters), according to USGS national mapping standards. The width of hand-drawn lines ranged from about 11–17m on the ground. Polygons were digitized so that the borders lay in the middle of the hand-drawn pen lines. Polygons that span two maps often did not line up exactly, and the degree of misalignment was variable. The maximum amount of misalignment was about 60 meters. Digitizers split the difference and created a smooth transition when connecting the two halves of the same polygon.

Digitizing polygons

Polygons were digitized on-screen in ArcView 3.2 (ESRI Redlands, California). Attributes recorded for each forest stand polygon include identification number, stand type, type identifier, timber type, and stand number. Listed below are attributes recorded for each forest stand polygon and associated information:

1. Identification number: A unique number assigned by WYNDD personnel to individual polygons. The sole purpose of adding identification numbers was to generate a total number of polygons.

2. Stand type: Two- or four-letter abbreviation identifying tree species in the polygon assigned by WYNDD employees based on information recorded on the original paper maps. These abbreviations include mixed-conifer combinations (e.g., LP/MC) indicated by color coding on the paper maps, but not always incorporated into the timber type (see Type identifier below for species names and abbreviations). For example, aspen/mixed-conifer stands were indicated on maps using color coding, but the timber type for these stands indicates aspen only. Thus, depending on species present in the stand, the stand type may more specifically describe species present in the stand than the timber type.

3. Type identifier: A number assigned to each stand type by WYNDD employees based on the timber type recorded on the original paper maps to be used to display polygons by tree species.

   AA (aspen) = 1
   AA/MC (aspen/mixed conifer) = 2
   LP (lodgepole pine) = 3
   LP/MC (lodgepole pine/mixed conifer) = 4
   SF (subalpine fir) = 5
   SF/MC (subalpine fir/mixed conifer) = 6
   DF (Douglas-fir) = 7
   DF/MC (Douglas-fir/mixed conifer) = 8

MA/JU (mahogany/juniper) = 9

MC (mixed conifer) = 10

MA (mahogany) = 11

No data = 12

LI (limber pine) = 13

NS (non-stocked, areas logged or burned with no re-growth) = 14

4. Timber type: Three-part polygon identifier containing information about tree species, size class, and stocking density (e.g., LP9M) assigned by the polygon creator. Tree species abbreviations follow those listed above. Definitions of the other components (Bill Lanning, BLM, personal communication) are below.

   Size classes:

   6 = seedlings <1 inch diameter at breast height (dbh)

   7 = saplings 1-4.99 inches dbh

   8 = poles 5.0-8.49 inches dbh

   9 = saw timber 8.5+ inches dbh

   Stocking rates:

   P = poorly stocked

   M = medium stocking

   W = well stocked

5. Stand number: A stand number was assigned to individual polygons by the polygon creator (e.g., 2-51). A single stand number may represent two nearby polygons if they are the same timber type.

All of the above information is included in the metadata (Appendix A). The metadata follows the Federal Geographic Data Committee metadata standard version FGDC-STD-001-1998.

Results and Discussion

A total of 1,331 polygons was digitized (Figure 2, Figure 3a-3d). The polygons cover over 19,000 ha (47,000 acres) within the BLM Pinedale management area. However, this does not include all forest stands within the BLM Pinedale management area. Total number of polygons, mean polygon area, and area occupied by each stand type are listed in Table 2. Total number of polygons, mean polygon area, and area occupied by each timber type is listed in Table 3.

Some stand types occupied relatively large areas (Figure 4), although mean patch size, as indicated by mean polygon area, may be relatively small (Table 2). Aspen occupied the largest total area (4655 ha), although mean patch size was only 10 ha. Douglas-fir and lodgepole pine stand types occupied the next largest total areas (approximately 3800 ha each), but mean polygon sizes were 16 ha and 18 ha, respectively. The largest mean polygon size was 69 ha for the Douglas-fir/mixed conifer stand type that occupied at total of 1,246 ha.

Total area occupied by stands of different size classes was relatively constant, except for the largest size class (Figure 5). The largest size class, saw timber at least 8.5 inches dbh, occupied 28-38 times more area than the other types. However, these totals may not reflect proportions of size classes within the entire BLM Pinedale management area, since not all stands within the management area were delineated by the polygon creator. Moreover, there may have been a bias toward recording stands with larger, more well-stocked trees.

About half of all forest stands in this analysis were medium-stocked (Figure 6). About 40 % of the stands were well-stocked, and 10 % were poorly-stocked (Figure 6). The stocking pattern in coniferous forests only was similar, although about half of the stands were well-stocked, 40 % were medium-stocked, and 12 % of coniferous forests were poorly stocked (Figure 7).

Coniferous forests occupied about 12,500 ha, or 65 % of the total area in this analysis, and are a subset of potential lynx habitat in western Wyoming. It is commonly believed that favorable lynx habitat includes a mixture of age classes. Lynx use older forests for den sites, and favorable habitat for snowshoe hares, primary lynx prey, is young, regenerating forest (Ruggiero et al. 1999). Over 10,000 ha in this analysis are dominated by trees larger than 8.5 inches dbh, about 2,000 ha are dominated by trees 5.0-8.49 inches, and trees less than 5.0 inches dbh occupy less than 1,000 ha (Figure 8). The stocking rates of coniferous stands in this analysis are skewed

toward higher stocking rates. Eighty-eight percent of coniferous forests in this analysis are medium- or well-stocked (Figure 7).

Acknowledgements

Thanks to Bill Lanning for information about polygon creation and timber type attributes. Special thanks to Nate Nibbelink for GIS assistance and to Darby Dark-Smiley for help with digitizing polygons.

Literature Cited

Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 1999. Ecology and Conservation of Lynx in the United States. U.S. Forest Service General Technical Report RMRS-GTR-30WWW. Rocky Mountain Research Station, Missoula, Montana.

Table 1. Tic registration error (the distance between the true geographic location for a point and the location entered manually during the georeferencing process) for topographic maps.

Topographic map	Cover units (meters)
Big Sandy Opening	3.189
Coal Creek	8.710
Cretaceous Mountain	2.833
Dodge Butte	6.773
Fontenelle Basin	8.279
Fremont Lake South	6.590
Fort Hill	4.342
The Hogsback	7.939
Kendall Mountain	8.632
Kismet Peak	8.975
Lake Mountain 1	1.462
Lake Mountain 2	2.487
Maki Creek	7.416
Merna	2.046
New Fork Lakes	2.578
Noble Basin	10.930
Pass Peak	29.721
Pine Grove Ridge	5.199
Pocket Creek Lake	3.365
Prospect Peak	0.681
Raid Lake	3.851
Red Castle Creek	7.724
Scab Creek	6.721
Signal Hill	10.600
Springman Creek 1	1.361
Springman Creek 2	2.966
Warren Bridge	4.138
Webb Draw	7.787
MEAN	**6.332**

Table 2. Total number of polygons, mean polygon area, and total area for each stand type.

Stand type	Total number of polygons	Total area (ha)	Mean polygon area (ha)	Total area (ac)	Mean polygon area (acres)
Aspen	466	4655	10	11498	25
Aspen/mixed conifer	207	1662	8	4105	20
Lodgepole pine	213	3805	18	9398	44
Lodgepole pine/mixed conifer	17	597	35	1475	87
Subalpine fir	106	1606	15	3967	37
Subalpine fir/mixed conifer	43	1613	38	3984	93
Douglas-fir	239	3851	16	9512	40
Douglas-fir/mixed conifer	18	1246	69	3078	171
Mixed conifer	4	31	8	77	19
Mahogany	8	58	7	143	18
No data	1	9	9	22	22
Limber pine	6	61	10	151	25
Non-stocked	3	13	4	32	11
TOTAL	**1331**	**19207**		**47441**	

Table 3. Total number of polygons, mean polygon area, and total area for each timber type. Stocking rate information was not included for some forest stand polygons.

Timber type	Total number of polygons	Total area (ha)	Mean polygon area (ha)	Total area (ac)	Mean polygon area (ac)
AA7	3	9	3	21	7
AA7M	16	143	9	353	22
AA7P	4	37	9	92	23
AA7W	10	42	4	104	10
AA8M	320	3059	10	7555	24
AA8M/SF9P	1	9	9	22	22
AA8P	22	166	8	410	19
AA8P/LI9	1	11	11	26	26
AA8W	169	1546	9	3818	23
AA9M	104	1055	10	2607	25
AA9P	6	68	11	168	28
AA9W	17	179	11	442	26
D9P	1	4	4	11	11
DF6	2	14	7	34	17
DF8M	16	240	15	593	37
DF8P	1	7	7	16	16
DF8W	19	345	18	852	45
DF9M	111	1752	16	4328	39
DF9P	63	792	13	1957	31
DF9P/8P	1	60	60	149	149
DF9W	43	1884	44	4653	108
LI9M	2	31	16	77	38
LI9P	4	30	7	73	18
LP6	11	16	1	40	4
LP6/7	17	96	6	236	14
LP6/7, SF6/7	1	4	4	10	10
LP6/7/SF	4	127	32	315	79
LP6/AA6	1	40	40	98	98
LP7	1	1	1	4	4
LP7M	4	30	7	74	18
LP7W	1	42	42	103	103
LP8/9W	1	73	73	180	180
LP8M	25	339	14	836	33
LP8P	7	65	9	160	23
LP8W	39	654	17	1614	41
LP9	1	8	8	19	19
LP9M	65	1369	21	3382	52
LP9P	23	214	9	528	23
LP9P/A8P	1	10	10	24	24
LP9P/LP6	1	82	82	203	203
LP9W	28	1238	44	3059	109
Mahogany	8	58	7	144	18

NS	3	13	4	32	11
No Data	2	11	5	27	13
SF6/7/DF	1	32	32	79	79
SF7P	1	4	4	9	9
SF8M	11	94	9	231	21
SF8P	6	63	11	156	26
SF8W	7	100	14	247	35
SF9M	64	1136	18	2806	44
SF9M/AA9M	2	18	9	44	22
SF9P	18	182	10	450	25
SF9P/8P	1	16	16	40	40
SF9W	40	1592	40	3933	98
TOTAL	**1331**	**19207**		**47442**	

Figure 1. Location of digitized forest stands within Wyoming and relative positions of the topographic maps on which the forest stand polygons were drawn.

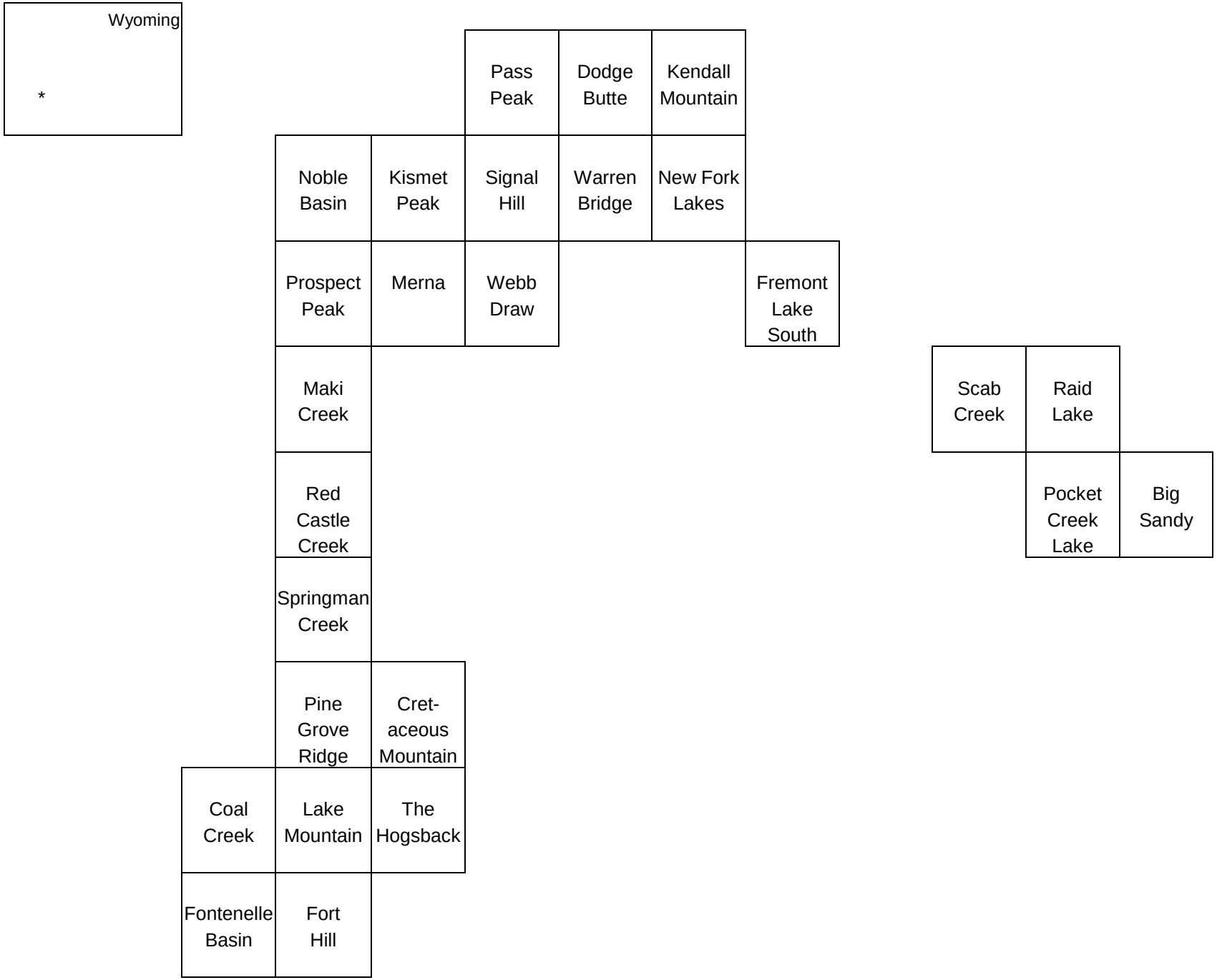


Figure 2. Overview of the study area in southwest Wyoming and digitized polygons.

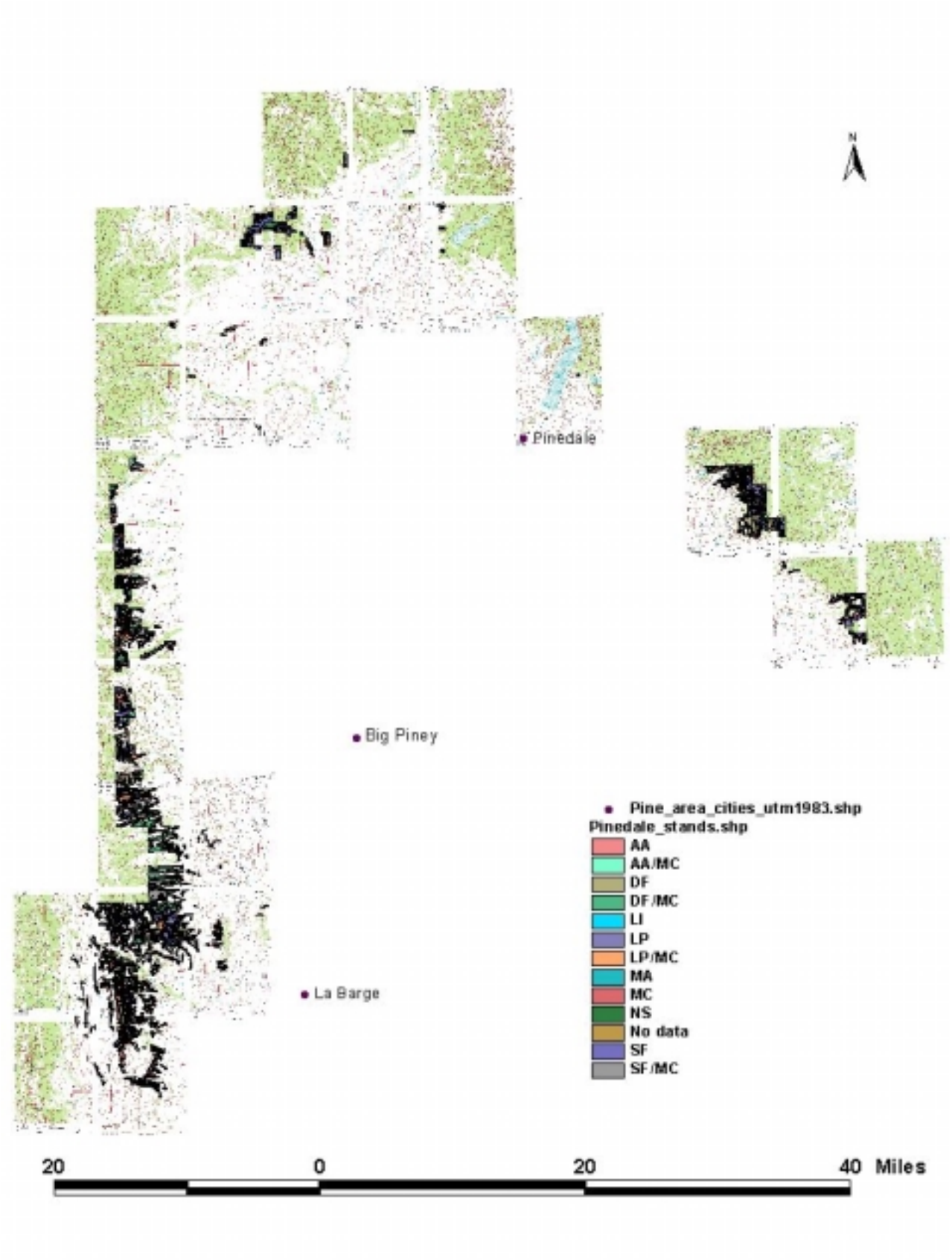


Figure 3a. Easternmost portion of the study area and digitized polygons.

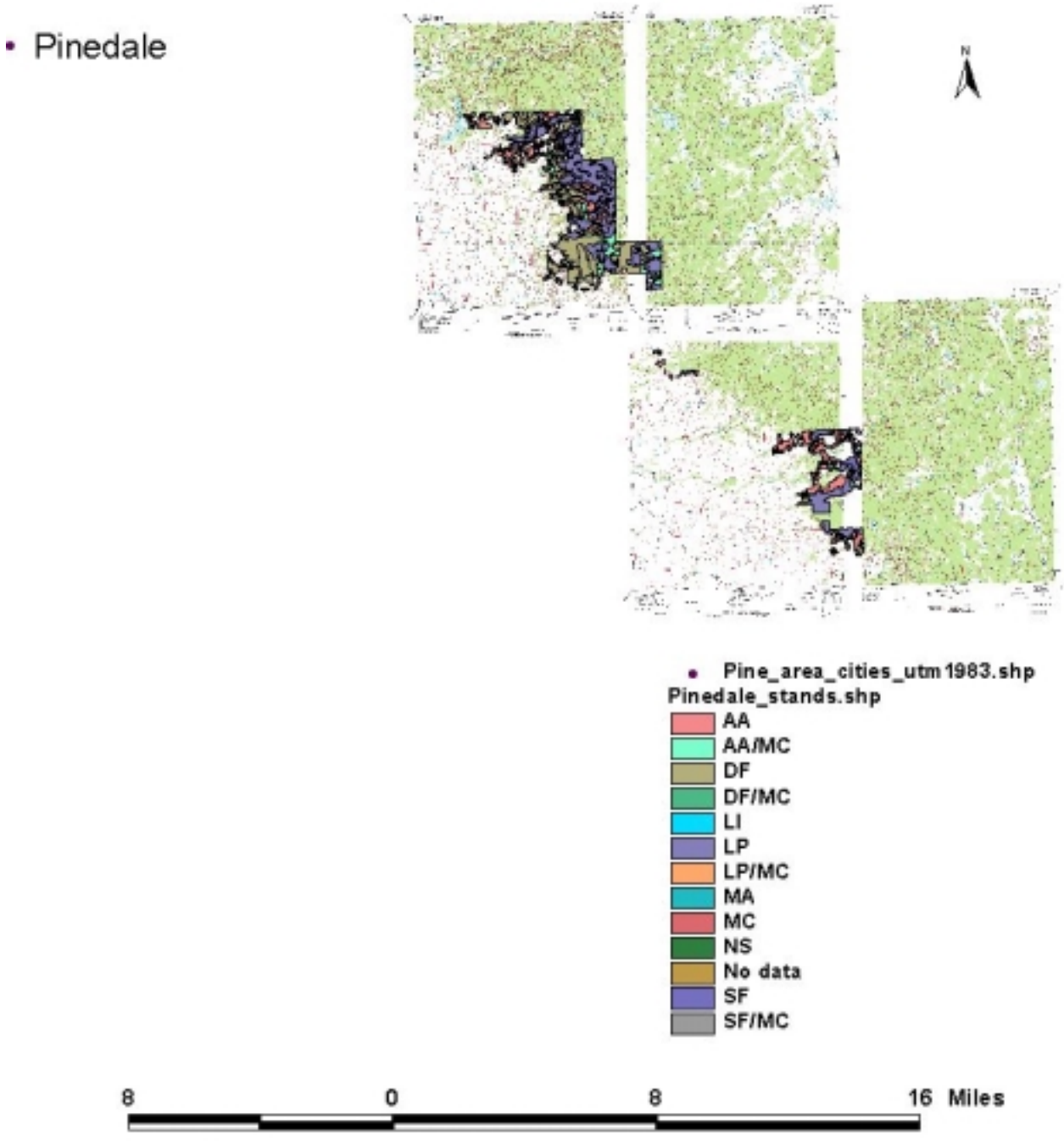


Figure 3b. Northernmost portion of the study area and digitized polygons.

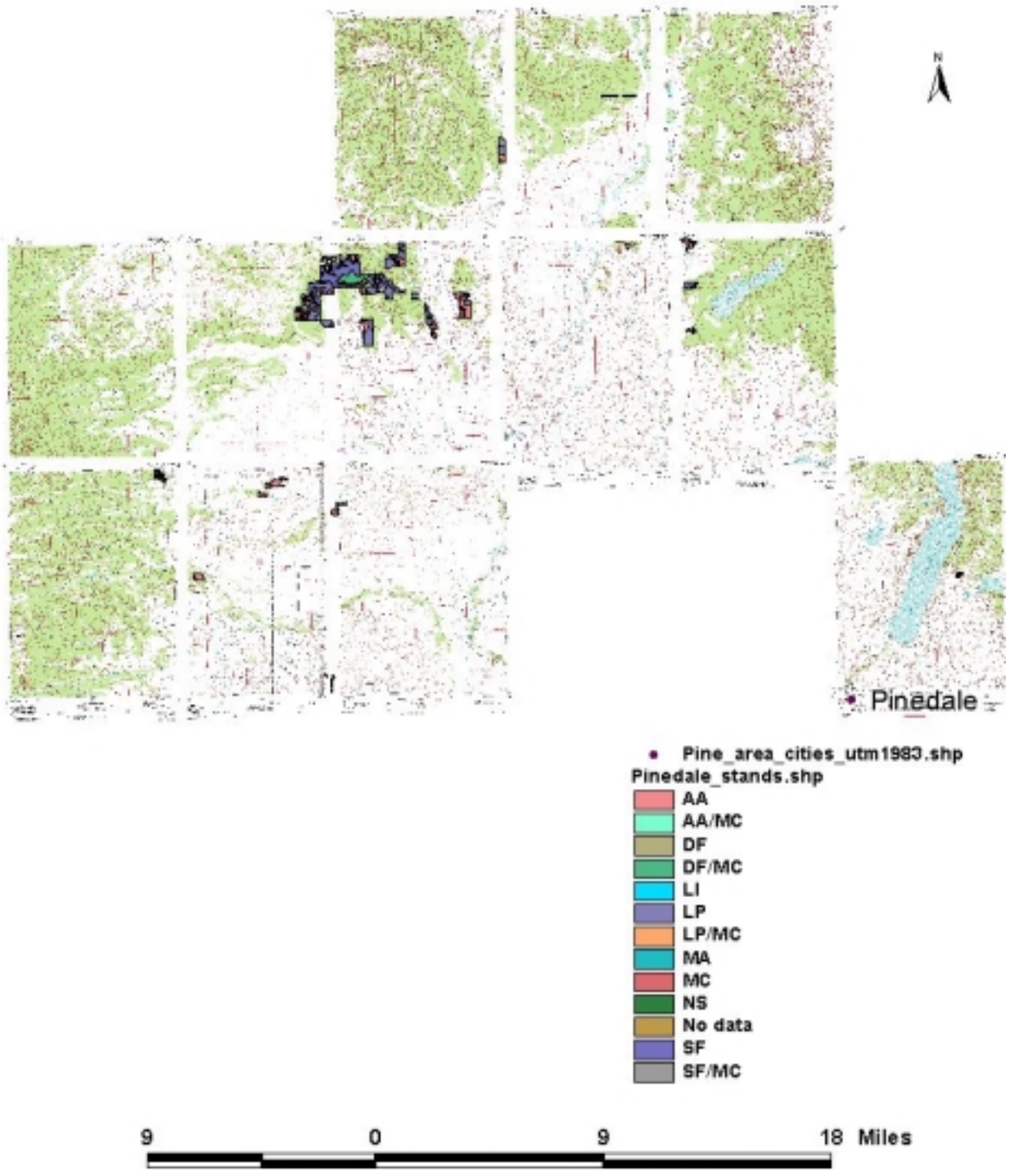


Figure 3c. Western edge of the study area and digitized polygons.

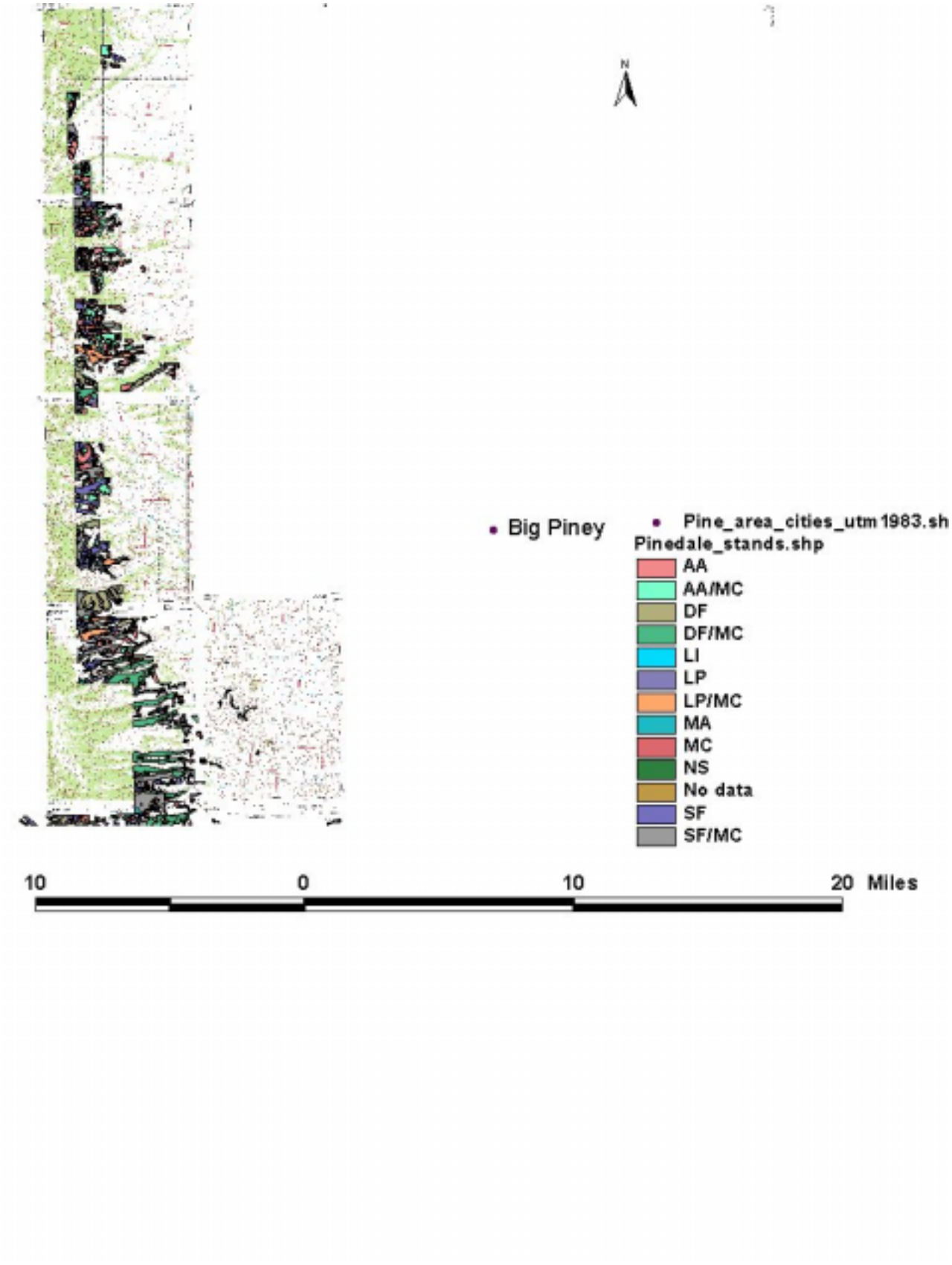


Figure 3d. Southernmost portion of the study area and digitized polygons.

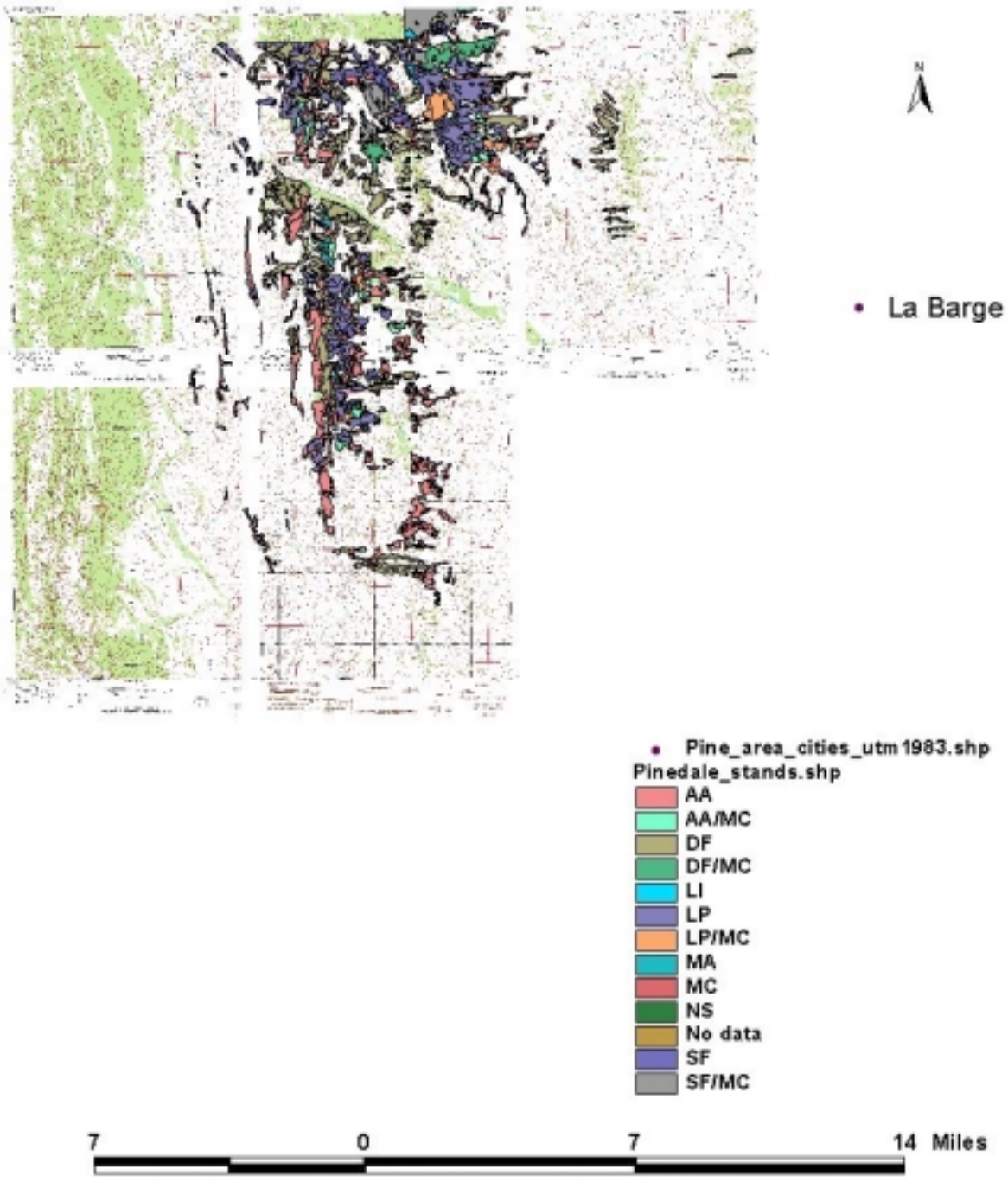


Figure 4. Percent of area, delineated on the 26 topographic maps, occupied by different stand types. This chart does not include all forest stands within the BLM Pinedale management area.

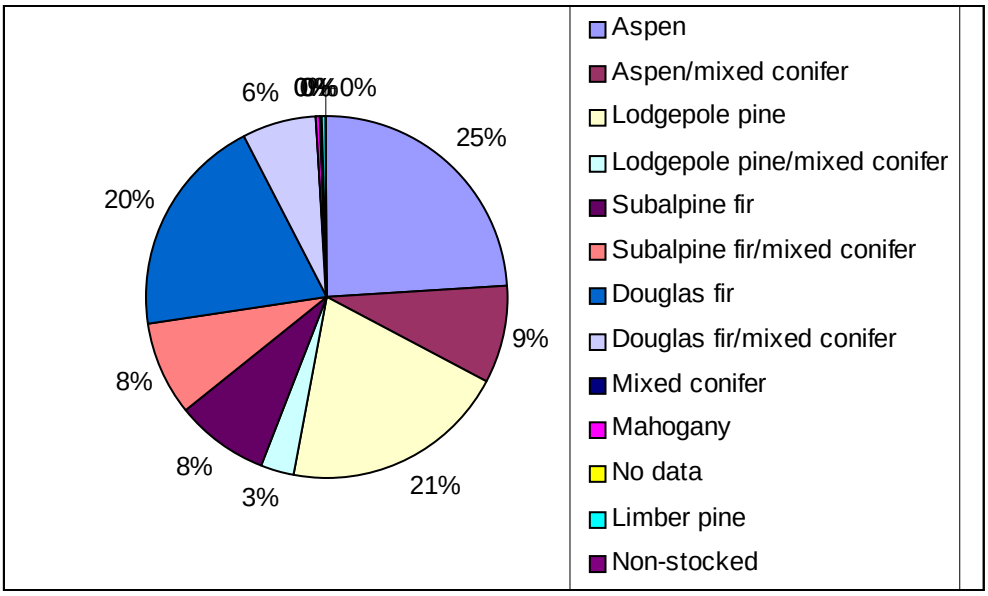


Figure 5. Area occupied by stands of different size classes. Where two size classes were listed for one stand, the stand was placed in the smaller size class. This chart does not include all forest stands on BLM land within the BLM Pinedale management area.

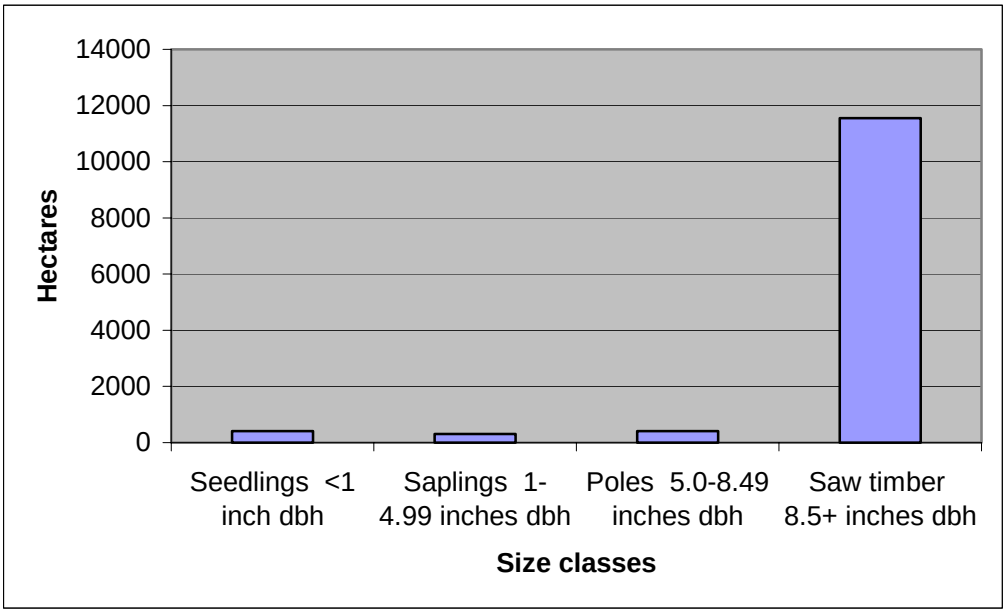


Figure 6. Area occupied by stands with different stocking rates. Where two stocking rates were listed in a timber type, the stand was placed in the lower stocking class. This chart does not include all forest stands on BLM land in the BLM Pinedale management area.

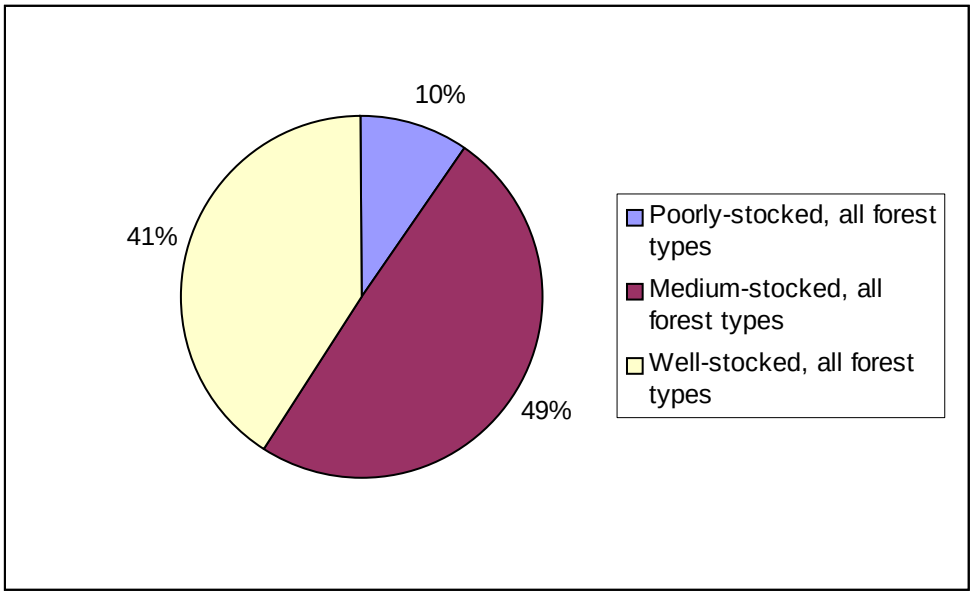


Figure 7. Area occupied by coniferous forests with different stocking rates. Where two stocking rates were listed in a timber type, the stand was placed in the lower stocking class. This chart does not include all coniferous forest stands on BLM land in the BLM Pinedale management area.

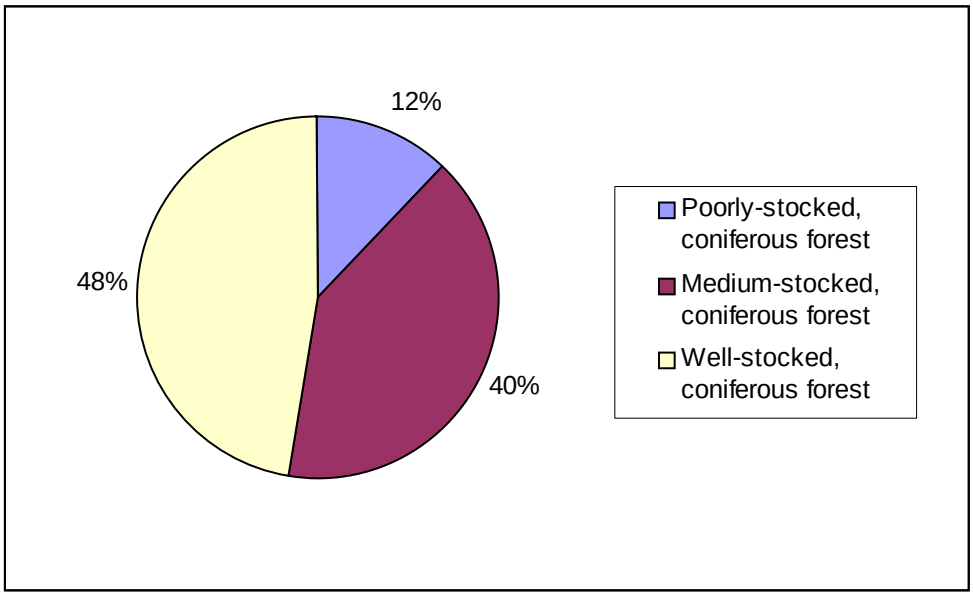
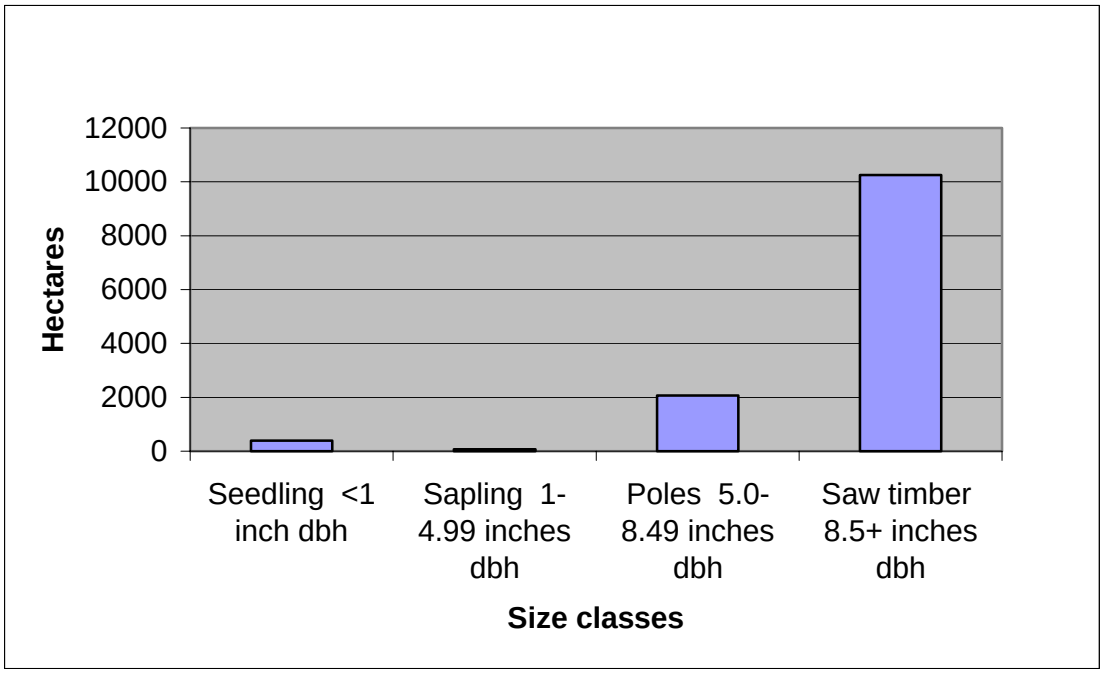


Figure 8. Area occupied by coniferous stands of different size classes. Where two size classes were listed for one stand, the stand was placed in the smaller size class. This chart does not include all coniferous forest stands on BLM land within the BLM Pinedale management area.



Appendix A.

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IDENTIFICATION_INFORMATION

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      Edition:
      Geospatial_Data_Presentation_Form: Map
      Publication_Information:
        Publication_Place: Laramie, Wyoming
        Publisher: Wyoming Natural Diversity Database (WYNDD)
      Other_Citation_Details:
      Online_Linkage: wndd@uwyo.edu
  Description:
    Abstract:
      This data describes some forest stands in the BLM
      Pinedale management area. The data set contains attributed
      polygons digitized from scanned, georeferenced images of 28
      paper topographic images. The polygons were hand-drawn from
      1988-1990 on the paper maps based on field observations.
    Purpose:
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    Time_Period_Information:
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        Ending_Date: 1990
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    Place:
      Place_Keyword_Thesaurus: None
      Place_Keyword: Pinedale BLM Field Office Management Area
  Access_Constraints:
  Use_Constraints:
    Persons using the information presented should fully
    understand the data collection, development, and
    attribution procedures as described in the metadata. The
    burden for determining applicability for analysis purposes
```

```
    lies entirely with the user. For purposes of publication or
    dissemination, citations or credit should be given to the
    Wyoming Natural Diversity Database (WYNDD).
  Point_of_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: Bureau of Land Management State Office
        Contact_Person:
      Contact_Position: BLM State Botanist
      Contact_Address:
        Address_Type: mailing and physical address
        Address: P.O. Box 1828
        City: Cheyenne
        State_or_Province: Wyoming
        Postal_Code: 82003-1828
        Country: USA
      Contact_Voice_Telephone: 307-775-6256
      Contact_Facsimile_Telephone:
      Contact_Electronic_Mail_Address:
      Hours_of_Service:
  Native_Data_Set_Environment:
    ArcView version 3.2 shapefile format
    j:\workspace\pinedale_stands.shp

DATA_QUALITY_INFORMATION

  Attribute_Accuracy:
    Attribute_Accuracy_Report:
      The attributes assigned to the polygons are considered an
      accurate interpretation of these forest stands as they
      existed between 1988-1990.
  Logical_Consistency_Report:
    This data set is considered topologically "clean"; polygons
    are complete and closed.
  Completeness_Report:
    This data does not include all forested areas within the
    Pinedale BLM management area. Stocking rate information is
    unavailable for some forest stand polygons.
  Positional_Accuracy:
    Horizontal_Positional_Accuracy:
      Horizontal_Positional_Accuracy_Report:
        Polygons were drawn on USGS 1:24,000-scale topographic maps,
        which have an inherited error of +/- 40 feet according to USGS
        national mapping standards. The tic registration error
        estimate for 27 of 28 maps is less than 11 meters. The tic
        registration error for the 28th map is 30 meters. Width of
        hand-drawn lines comprising polygons was generally 11-17
        meters. Digitized lines were placed along the middle of
        the hand-drawn lines. Polygons were digitized on-screen.
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      Source_Citation:
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Publication_Information:
Publication_Place: Unpublished
Publisher:
Other_Citation_Details:
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Ending_Date:
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The data is a digital form of the original paper topographic maps on which polygons representing forest stands were hand-drawn.
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Twenty-eight topographic maps with hand-drawn polygons representing forest stands were scanned at 400 dpi. Maps scanned at 400, 600, and 800 dpi were compared, and the resolution of maps scanned at 400 dpi were judged to be sufficient. Scanned images were registered, transformed, and rectified using UTM coordinates of the four corners of each map in ARC 8.1. Projection and publication information were cut off some time in the past. There were at least 3 different projections present among the 28 maps. All the topographic maps were 'forced' into the UTM projection by recording the latitude and longitude for each of the four corners of each map, converting the latitude and longitude coordinates to decimal degrees, and converting decimal degrees to UTM coordinates. Tic registration error of 27 of 28 maps was less than 11 meters. Tic registration error of the 28th map was 30 meters. The scanned, georeferenced map images were overlain on topographic quad boundaries to detect obvious georeferencing errors.
Polygons were digitized on-screen using ArcView 3.2. The width of the hand-drawn lines was generally 11-17 meters. Digitized lines were placed in the middle of the hand-drawn lines.
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            (WYNDD)
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            City: Laramie
            State_or_Province: Wyoming
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          Hours_of_Service:

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      SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
      Point_and_Vector_Object_Count: 1331

SPATIAL_REFERENCE_INFORMATION

  Horizontal_Coordinate_System_Definition:
    Planar:
      Grid_Coordinate_System:
        Grid_Coordinate_System_Name: Universal Transverse Mercator
        Universal_Transverse_Mercator:
          UTM_Zone_Number:  12
          Transverse_Mercator:
            Scale_Factor_at_Central_Meridian: 0.999600
            Longitude_of_Central_Meridian: -111.000000
            Latitude_of_Projection_Origin: 0.000000
            False_Easting: 500000.000000
            False_Northing: 0.000000
      Planar_Coordinate_Information:
        Planar_Coordinate_Encoding_Method: Coordinate pair
        Coordinate_Representation:
          Abscissa_Resolution:
          Ordinate_Resolution:
        Planar_Distance_Units: Meters
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name: GRS 80
      Semi-major_Axis: 6378137.0000000
```

```
      Denominator_of_Flattening_Ratio: 298.26

ENTITY_AND_ATTRIBUTE_INFORMATION

  Detailed_Description:
    Entity_Type:
      Entity_Type_Label: pinedale_stands.dbf
      Entity_Type_Definition: Shapefile Attribute Table
      Entity_Type_Definition_Source: None
    Attribute:
      Attribute_Label: Area__sq_m
      Attribute_Definition: Area of polygon
      Attribute_Definition_Source: Software generated
      Attribute_Domain_Values:
        Unrepresentable_Domain:
          Software computed
    Attribute:
      Attribute_Label: ID
      Attribute_Definition: Unique number automatically assigned to
      each polygon
      by ArcView
      Attribute_Definition_Source:
      Attribute_Domain_Values:
        Range_Domain:
          Range_Domain_Minimum: 1
          Range_Domain_Maximum: 2477
    Attribute:
      Attribute_Label: Stand_type
      Attribute_Definition: Two- or four-letter abbreviation
      identifying tree species, including mixed-conifer types. Mixed
      conifer types are not always incorporated in the Timber type
      (see below).
      Attribute_Definition_Source:
      Attribute_Domain_Values:
        Enumerated_Domain:
          Enumerated_Domain_Value: AA
          Enumerated_Domain_Value_Definition: Aspen
          Enumerated_Domain_Value_Definition_Source:
          Enumerated_Domain_Value: AA/MC
          Enumerated_Domain_Value_Definition: Aspen/mixed conifer
          Enumerated_Domain_Value_Definition_Source:
          Enumerated_Domain_Value: DF
          Enumerated_Domain_Value_Definition: Douglas fir
          Enumerated_Domain_Value_Definition_Source:
          Enumerated_Domain_Value: DF/MC
          Enumerated_Domain_Value_Definition: Douglas-fir/mixed
          conifer
          Enumerated_Domain_Value_Definition_Source:
          Enumerated_Domain_Value: LI
          Enumerated_Domain_Value_Definition: Limber pine
          Enumerated_Domain_Value_Definition_Source:
          Enumerated_Domain_Value: LP
```

```
      Enumerated_Domain_Value_Definition: Lodgepole pine
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: LP/MC
      Enumerated_Domain_Value_Definition: Lodgepole pine/mixed
      conifer
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: MA
      Enumerated_Domain_Value_Definition: Mahogany
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: MC
      Enumerated_Domain_Value_Definition: Mixed conifer
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: No data
      Enumerated_Domain_Value_Definition: No data available
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: NS
      Enumerated_Domain_Value_Definition: Non-stocked
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: SF
      Enumerated_Domain_Value_Definition: Subalpine fir
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: SF/MC
      Enumerated_Domain_Value_Definition: Subalpine fir/mixed
      conifer
      Enumerated_Domain_Value_Definition_Source:
Attribute:
  Attribute_Label: Type_ident
  Attribute_Definition: A number assigned to each stand type that
  may be used to display polygons by tree species.
  Attribute_Definition_Source:
  Attribute_Domain_Values:
    Enumerated_Domain:
      Enumerated_Domain_Value: 1
      Enumerated_Domain_Value_Definition: Aspen
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: 10
      Enumerated_Domain_Value_Definition: Mixed conifer
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: 11
      Enumerated_Domain_Value_Definition: Mahogany
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: 12
      Enumerated_Domain_Value_Definition: No data
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: 13
      Enumerated_Domain_Value_Definition: Limber pine
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: 14
      Enumerated_Domain_Value_Definition: Non-stocked
      Enumerated_Domain_Value_Definition_Source:
      Enumerated_Domain_Value: 2
      Enumerated_Domain_Value_Definition: Aspen/mixed conifer
```

```
            Enumerated_Domain_Value_Definition_Source:
            Enumerated_Domain_Value: 3
            Enumerated_Domain_Value_Definition: Lodgepole pine
            Enumerated_Domain_Value_Definition_Source:
            Enumerated_Domain_Value: 4
            Enumerated_Domain_Value_Definition: Lodgepole pine/mixed
            conifer
            Enumerated_Domain_Value_Definition_Source:
            Enumerated_Domain_Value: 5
            Enumerated_Domain_Value_Definition: Subalpine fir
            Enumerated_Domain_Value_Definition_Source:
            Enumerated_Domain_Value: 6
            Enumerated_Domain_Value_Definition: Subalpine fir/mixed
            conifer
            Enumerated_Domain_Value_Definition_Source:
            Enumerated_Domain_Value: 7
            Enumerated_Domain_Value_Definition: Douglas-fir
            Enumerated_Domain_Value_Definition_Source:
            Enumerated_Domain_Value: 8
            Enumerated_Domain_Value_Definition: Douglas-fir/mixed
            conifer
            Enumerated_Domain_Value_Definition_Source:
      Attribute:
        Attribute_Label: Timber_type
        Attribute_Definition: Three-part identifier containing
        information about
        tree species, size class, and stocking rate
        Attribute_Definition_Source:
        Attribute_Domain_Values:
          Unrepresentable_Domain: Size classes: 6 = seedlings <1 inch
          diameter at breast height (dbh) 7 = saplings 1-4.99 inches dbh
          8 = poles 5.0-8.49 inches dbh 9 = saw timber 8.5+ inches dbh
          Stocking rates: P = Poorly stocked M = Medium stocking W =
          Well-stocked
      Attribute:
        Attribute_Label: Stand_number
        Attribute_Definition: A number assigned to polygons by the
        polygon creator. A single stand number may represent two nearby
        polygons, if they are the same timber type.
        Attribute_Definition_Source:
        Attribute_Domain_Values:
          Unrepresentable_Domain:

DISTRIBUTION_INFORMATION

  Distributor:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: Wyoming Natural Diversity Database
        (WYNDD)
        Contact_Person:
      Contact_Position: Data Manager
```

```
      Contact_Address:
        Address_Type: mailing and physical address
        Address: P.O. Box 3381
        City: Laramie
        State_or_Province: Wyoming
        Postal_Code: 82071
        Country: USA
      Contact_Voice_Telephone: 307-766-3023
      Contact_Facsimile_Telephone: 307-766-3026
      Contact_Electronic_Mail_Address: wndd@uwyo.edu
      Hours_of_Service:
  Resource_Description:
    Mapping of Forested Areas Within the Pinedale BLM Field Office
    Management Area
  Distribution_Liability:
    This data set was developed using ARC 8.1 and ArcView 3.2.
    Although this data has been processed successfully on
    computer systems at the Wyoming Natural Diversity Database
    (WYNDD), no warranty, expressed or implied, is made
    regarding the accuracy or utility of the data on any other
    systems for general or scientific purposes, nor shall the
    act of distribution constitute any such warranty. This
    disclaimer applies both to idividual use of the data and
    aggregate use with other data. WYNDD shall not be held
    liable for improper or incorrect use of the data described
    and/or contained herein.

METADATA_REFERENCE_INFORMATION

  Metadata_Date: 20020215
  Metadata_Review_Date:
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: Wyoming Natural Diversity Database
        (WYNDD)
        Contact_Person:
      Contact_Position: Data Manager
      Contact_Address:
        Address_Type: Mailing and physical address
        Address: P.O. Box 3381
        City: Laramie
        State_or_Province: Wyoming
        Postal_Code: 82071
        Country: USA
      Contact_Voice_Telephone: 307-766-3023
      Contact_Facsimile_Telephone: 307-766-3026
      Contact_Electronic_Mail_Address: wndd@uwyo.edu
      Hours_of_Service:
  Metadata_Standard_Name: FGDC CSDGM
  Metadata_Standard_Version: FGDC-STD-001-1998
```