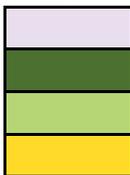


# Introduction to Land Cover Summary

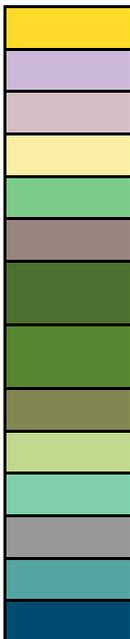
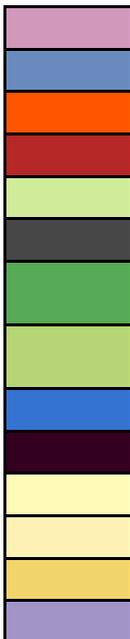
Land Use/Land Cover is one of 15 [Montana Spatial Data Infrastructure](#) framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download at the Montana State Library's [Geographic Information Clearinghouse](#).

Within the report area you have requested, land cover is summarized by acres of the following Level 1, Level 2, and Level 3 Ecological System categories present:

## Level 1

 <ul style="list-style-type: none"> <li>Alpine Systems</li> <li>Forest and Woodland Systems</li> <li>Grassland Systems</li> <li>Human Land Use</li> </ul>	 <ul style="list-style-type: none"> <li>Recently Disturbed or Modified</li> <li>Shrubland, Steppe and Savanna Systems</li> <li>Sparse and Barren Systems</li> <li>Wetland and Riparian Systems</li> </ul>
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## Level 2

 <ul style="list-style-type: none"> <li>Agriculture</li> <li>Alpine Grassland and Shrubland</li> <li>Alpine Sparse and Barren</li> <li>Bluff, Badland and Dune</li> <li>Bog or Fen</li> <li>Cliff, Canyon and Talus</li> <li>Conifer-dominated forest and woodland (mesic-wet)</li> <li>Conifer-dominated forest and woodland (xeric-mesic)</li> <li>Deciduous dominated forest and woodland</li> <li>Deciduous Shrubland</li> <li>Depressional Wetland</li> <li>Developed</li> <li>Floodplain and Riparian</li> <li>Forested Marsh</li> </ul>	 <ul style="list-style-type: none"> <li>Harvested Forest</li> <li>Herbaceous Marsh</li> <li>Insect-Killed Forest</li> <li>Introduced Vegetation</li> <li>Lowland/Prairie Grassland</li> <li>Mining and Resource Extraction</li> <li>Mixed deciduous/coniferous forest and woodland</li> <li>Montane Grassland</li> <li>Open Water</li> <li>Recently burned</li> <li>Sagebrush Steppe</li> <li>Sagebrush-dominated Shrubland</li> <li>Scrub and Dwarf Shrubland</li> <li>Wet meadow</li> </ul>
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### Level 3

Active and Stabilized Dune	Low Intensity Residential
Alpine Bedrock and Scree	Low Sagebrush Shrubland
Alpine Dwarf-Shrubland	Major Roads
Alpine Fell-Field	Mat Saltbush Shrubland
Alpine Ice Field	Mixed Salt Desert Scrub
Alpine Turf	Montane Sagebrush Steppe
Alpine-Montane Wet Meadow	Mountain Mahogany Woodland and Shrubland
Aspen and Mixed Conifer Forest	Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland
Aspen Forest and Woodland	Oil and Oil / Gas
Big Sagebrush Shrubland	Open Water
Big Sagebrush Steppe	Other Roads
Burned Sagebrush	Pasture/Hay
Coal Bed Methane	Post-Fire Recovery
Commercial / Industrial	Quarries, Strip Mines and Gravel Pits
Cultivated Crops	Railroad
Developed, Open Space	Recently burned forest
Emergent Marsh	Recently burned grassland
Gas and Gas Storage	Recently burned shrubland
Geysers and Hot Springs	Rocky Mountain Cliff, Canyon and Massive Bedrock
Greasewood Flat	Rocky Mountain Conifer Swamp
Great Plains Badlands	Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest
Great Plains Cliff and Outcrop	Rocky Mountain Foothill Limber Pine - Juniper Woodland
Great Plains Closed Depressional Wetland	Rocky Mountain Foothill Woodland-Steppe Transition
Great Plains Floodplain	Rocky Mountain Lodgepole Pine Forest
Great Plains Mixedgrass Prairie	Rocky Mountain Lower Montane, Foothill, and Valley Grassland
Great Plains Open Freshwater Depression Wetland	Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland
Great Plains Ponderosa Pine Woodland and Savanna	Rocky Mountain Lower Montane-Foothill Shrubland
Great Plains Prairie Pothole	Rocky Mountain Mesic Montane Mixed Conifer Forest
Great Plains Riparian	Rocky Mountain Montane Douglas-fir Forest and Woodland
Great Plains Saline Depression Wetland	Rocky Mountain Montane-Foothill Deciduous Shrubland
Great Plains Sand Prairie	Rocky Mountain Ponderosa Pine Woodland and Savanna
Great Plains Shrubland	Rocky Mountain Poor Site Lodgepole Pine Forest
Great Plains Wooded Draw and Ravine	Rocky Mountain Subalpine Deciduous Shrubland
Harvested forest-grass regeneration	Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
Harvested forest-shrub regeneration	Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
Harvested forest-tree regeneration	Rocky Mountain Subalpine Woodland and Parkland
High Intensity Residential	Rocky Mountain Subalpine-Montane Fen
Injection	Rocky Mountain Subalpine-Montane Mesic Meadow
Insect-Killed Forest	Rocky Mountain Subalpine-Montane Riparian Shrubland
Interstate	Rocky Mountain Subalpine-Montane Riparian Woodland
Introduced Riparian and Wetland Vegetation	Rocky Mountain Subalpine-Upper Montane Grassland
Introduced Upland Vegetation - Annual and Biennial Forbland	Rocky Mountain Wooded Vernal Pool
Introduced Upland Vegetation - Annual Grassland	Shale Badland
Introduced Upland Vegetation - Perennial Grassland and Forbland	Wind Turbine
Introduced Upland Vegetation - Shrub	Wyoming Basin Cliff and Canyon

### Literature Cited

- Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.
- Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.