Appendix A: Data Sources

The Conservation Resources Atlas for Missoula County relies on data from numerous sources. This section provides information on data sources, including the name of the agency, organization, or individual that created the data, followed by the date the data were last updated, the name or description of the dataset, and where interested parties should go to obtain the data for their own purposes.

WORKING LANDS MAPS:

WL1: Soils of Farmland Importance
This map was created by selected all soils in Missoula County identified as important farmland soils in the NRCS soils database.

1. Natural Resource Conservation Service (NRCS), 2009. Soils Data Mart data for Missoula County, MT. The data are available for download, and more information about soils data are provided by NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/). Additional information about local soils can be obtained by contacting the NRCS Missoula Area Office ((406)829-3395).

WL2: Currently Farmed Lands
This map was created by intersecting the Final Land Unit (FLU) data from the MT Department of Revenue with cadastral data for Missoula County, then selecting all private agricultural lands that were classified as farm lands (irrigated, continuous crop, wild hay, or fallow in the FLU data).

2. Montana Department of Revenue (DOR), 2009. Final Land Unit Classification. Draft data were provided to Missoula County Rural Initiatives (RI) for use in the PLACE project. Inquiries about and requests for data should be submitted to the Montana Department of Revenue (http://revenue.mt.gov/revenue/; (406)444-6900).

WL3: Irrigation Ditches
This map was created by combining two datasets on existing irrigation ditches:

3. Missoula City-County Office of Planning and Grants (OPG), 2010. Irrigation ditches in the Missoula Urban Area. Data are managed by Casey Wilson. Inquiries about and requests for data should be submitted to OPG (http://www.co.missoula.mt.us/opgweb/; (406)258-4657).

4. Missoula County Rural Initiatives (RI), 2010. Irrigation ditches in the Frenchtown/Grass Valley area. Data were obtained by digitizing aerial photos with the assistance of local farmers and ranchers. Inquiries about and requests for data should be submitted to RI: http://www.co.missoula.mt.us/rural/; (406)258-3432).

WL4: Grazing Leases on Public and Corporate Lands
This map was created by combining data sources on grazing leases, licenses, or allotments from the following sources:

5. US Bureau of Land Management (BLM), Missoula Field Office, 2010. Grazing leases on BLM lands in Missoula County. Information on grazing lease areas were provided to Missoula County Rural Initiatives (RI) by Steve Bell, Rangeland Management Specialist with BLM; data were then digitized by RI. Inquiries about grazing on BLM lands should be directed to the BLM Missoula Field Office (http://www.blm.gov/mt/st/en/fo/missoula_field_office.html). Requests for GIS data should be directed to RI (http://www.co.missoula.mt.us/rural/; (406)258-3432).

6. Montana Department of Natural Resources and Conservation (DNRC), 2010.
Grazing leases or licenses on DNRC lands in Missoula County. Legal descriptions of grazing leases and licenses areas were provided to Missoula County Rural Initiatives (RI) by the DNRC Southwest Land Office; data were then digitized by RI. Inquiries about grazing on DNRC lands should be directed to the DNRC Southwest Land Office (http://dnrc.mt.gov/field_operations/areaoffices/MissoulaSWLO.asp; (406)542-4200). Requests for GIS data should be directed to RI (http://www.co.missoula.mt.us/rural/; (406)258-3432).

7. US Forest Service—Lolo National Forest, 2007. Range allotments managed by the Lolo National Forest. Data downloaded from Lolo National Forest GIS website (http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5068975.htm).

8. MT Dept. of Fish, Wildlife, and Parks, 2010. Grazing leases maintained by FWP. Shapefiles provided to RI by Jay Kolbe, wildlife biologist for FWP. Inquiries about grazing on FWP lands and requests for updated data on FWP grazing leases should be directed to the Region 2 FWP Office (http://fwp.mt.gov/regions/r2/; (406)542-5500).

9. Plum Creek Timber Company, 2010. Grazing leases managed by Plum Creek Timber Company. GIS sahpefiles were provided to RI by Brian Sugdon, fisheries biologist with Plum Creek. Inquiries about grazing on Plum Creek lands and requests for GIS data on Plum Creek grazing leases should be directed to Plum Creek Timber Company in western Montana (http://www.plumcreek.com/; (406)892-6200).

10. The Nature Conservancy, 2010. Grazing leases on lands owned and managed by The Nature Conservancy. Shapefiles provided to RI by Jim Berkey with TNC in Missoula. Inquiries about grazing on TNC lands and requests for GIS data on TNC grazing leases should be directed to TNC (http://www.nature.org/?src=logo; (606)543-6681).

11. Missoula Conservation District, 2009. Bonita-Clinton-Potomac Grazing Association boundaries. A hard copy map of the grazing association area was provided to RI by Tara Comfort from the Missoula Conservation District. Requests for maps and inquiries about the association should be directed to the Missoula Conservation District (http://missoulacd.org/contact_us.htm; (406)829-3395).

WL5: Private Grazing Lands
This map was created by intersecting the Final Land Unit (FLU) data from the MT Department of Revenue (citation #2 above) with cadastral data for Missoula County, then selecting all private agricultural lands that were classified as grazing lands in the FLU data.

WL6: Public Timber Lands
This map was created by combining data from multiple sources. For each National Forest in the county, we used data from the Forest Plan to identify areas considered suitable for commercial timber harvest. We also used the public land ownership data that is created by the Natural Heritage Program and was edited by the Nature Conservancy and Missoula County. From this data we selected lands owned by the BLM, as well as forested lands owned by the DNRC (using aerial photographs to determine if lands are forested or not).

12. US Forest Service—Lolo National Forest. 2002. Management Areas. Data regarding management areas and their definitions in relation to the Forest Plan can be downloaded from the Lolo National Forest at http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5068967.htm. We selected the following management areas from this dataset: MA_CODE= 16, 17, 18, 20, 21, 22, 23, 24, 25, 26

13. US Forest Service—Bitterroot National Forest. 2008. Management Areas. Data regarding management areas and their definitions in relation to the forest plan can be downloaded from the Bitterroot National Forest at http://www.fs.fed.us/r1/bitterroot/maps/gis_data.shtml. We selected the following management areas: Name= 1, 2, 3A.

14. US Forest Service—Flathead National Forest. 2008. Management Areas. Data regarding management areas and their definitions in relation to the forest plan can be downloaded from the Flathead National Forest at http://www.fs.fed.us/r1/flathead/gis/gis_data_index.shtml. ClassName= MA5, MA7, MA7A, MA9, MA11C, MA13, MA13C, MA15, MA15C, MA16, MA17.

15. Montana Natural Heritage Program. 2008. Montana Public Land Ownership. Dataset shows most public land parcels that are at least 40 acres in size, and can be accessed at http://nris.mt.gov/nsdi/nris/stew_owners.html.

16. The Nature Conservancy, 2008. Montana Legacy Project Lands. Lands purchased by TNC from Plum Creek will be re-sold to state and federal agencies as well as private conservation buyers with the goals of maintaining working timber lands, as well as others. GIS data on Legacy Project lands in Missoula County was provided to RI by TNC. Requests for GIS data should be directed to TNC Legacy Project staff (http://www.themontanalegacyproject.org/ (406)543-6681).

FLORA & FAUNA MAPS:

FF1: Lynx
This map was created by showing lynx Critical Habitat (#21 below), lynx analysis units (#18, 19 below), and lynx modeled habitat, a layer created by RI using data from sources #17, 20, 22, and 23 below).

17. United States Forest Service Northern Region. 2005. Canada lynx habitat for Forest Service lands for the Northern Rockies Lynx Amendment Area. Data were provided to RI by Tim Bertram, wildlife biologist for Region 1 of the USFS. Requests for copies of this dataset should be directed to: Tim Bertram, (406) 329-3611.

18. United States Forest Service— Lolo National Forest. 2006. Lynx Analysis Units on the Lolo National Forest. Data and metadata can be downloaded from http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5068965.htm.

19. United States Forest Service—Flathead National Forest. 2008. Lynx Analysis Units on the Flathead National Forest. Data provided to RI by Kathy Ake, GIS specialist for the Flathead National Forest. Requests for copies of this dataset should be directed to: Kathy Ake, Flathead National Forest, (406) 758-5358.

20. United States Bureau of Land Management—Missoula Field Office. 2009. Lynx habitat and lynx analysis units. Data provided to RI by James Sparks, wildlife biologist with BLM. Requests for copies of this dataset should be directed to: James Sparks, Missoula Field Office (BLM), (406) 329-3914. http://www.blm.gov/mt/st/en/fo/missoula_field_office.html

21. United States Fish and Wildlife Service. 2009. Critical habitat for Canada Lynx. Data show areas deemed Critical Habitat. Data and metadata can be downloaded from: http://criticalhabitat.fws.gov/.

22. Montana Department of Natural Resources and Conservation. 2008. Lynx Rules—modeled lynx habitat. Data were provided to RI by Ross Baty, wildlife biologist with DNRC. Requests for GIS data should be sent to rbaty@mt.gov.

23. Plum Creek Timber Company. Plum Creek Lynx Habitat Coverage. Data were provided to RI by Lorin Hicks, wildlife biologist for Plum Creek. Requests for GIS data should be sent to Lorin.Hicks@plumcreek.com.

FF2: Grizzly Bear
This map was created by showing data on occupied and recovery areas (#24) as well as linkage zones (#25).

24. US Fish and Wildlife Service. 2002. Grizzly Bear Recovery Zones and Distribution. Data were published by the USDA Forest Service, and were made available to RI by Kim Foiles, Region 1 Forest Service. Requests for GIS data should be sent to kfoiles@fs.fed.us.Servheen, Christopher. 1994. Grizzly Bear Linkage Zones for the Swan Valley and upper Seeley Lake. Data and metadata are available by contacting Dr. Chris Servheen, grizzly bear coordinator.

25. Servheen, Christopher. 1994. Grizzly Bear Linkage Zones for the Swan Valley and upper Seeley Lake. Data and metadata are available by contacting Dr. Chris Servheen, grizzly bear coordinator.

26. same as 24 above

FF3: Bull Trout
This map was created by showing data on proposed Critical Habitat (#27 below), watersheds identified by the Forest Service as priority for bull trout (#29, 30 below), and streams where bull trout currently exist (which was created by adding tabular data from #28 to a 100K stream layer, available for download from MT FWP).

27. US Fish and Wildlife Service. 2010. Proposed Critical Habitat for Bull Trout. Data were downloaded from USFWS from the following website: http://www.fws.gov/pacific/bulltrout/.

28. MT Fish, Wildlife, and Parks. 2010. Fish Distribution in Lakes and Streams. Data on fish species distribution are available for download from FWP at the following website: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html.

29. US Forest Service—Lolo National Forest. 2008. Bull Trout Priority Watersheds. GIS data are available for download from the following website: http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5068996.htm.

30. US Forest Service—Flathead National Forest. 1999. Bull Trout Priority Watersheds. Data were provided to RI by Beth Gardner, fisheries biologist for the Flathead National Forest. Requests for GIS data should be directed to bgardner@fs.fed.us.

FF4: Water Howellia
This map was created by selecting all sites with Water Howellia from the Species Occurrence Data.

31. Montana Natural Heritage Program. 2009. Species Occurrence Data for Plant Species of Concern in Montana. Data are provided to Missoula County by Montana Natural Heritage Program (MNHP) through a data use agreement. Requests for data should be directed to MNHP at http://mtnhp.org/Requests/ (mtnhp@mt.gov).

FF5: Plant Species of Concern
This map was created by selecting all non-Endangered or Threatened plant species from the Species Occurrence Data (#31 above).

FF6: Bald Eagle
This map was created by showing areas in Missoula County that potentially have habitat for bald eagles, according to a habitat predictability model.

32. Montana Natural Heritage Program. 2010. Bald Eagle Habitat model. Data was provided to RI by Bryce Maxell at MNHP. Requests for GIS data should be directed to MNHP at http://mtnhp.org/Requests/ (mtnhp@mt.gov).

FF7: Common Loon
This map was created by identifying lakes in Missoula County (see #44 below) that are used or have been used in recent years for breeding by loons in Missoula County, according to information in the Draft Common Loon Management Plan; the lakes were buffered by 500' to show the zone of possible influence.

33. Montana Fish, Wildlife, and Parks. 2010. Draft Common Loon Management Plan. Data were obtained on lakes that are used or have been used in recent years for breeding by loons in Missoula County, and spatially linked to a shapefile of lakes in Missoula County by Rural Initiatives. Requests for Common Loon Plan draft should be sent to Chris Hammond at FWP ((406)752-5501; chammond@mt.gov).

FF8: Westslope Cutthroat Trout
This map was created by showing streams with westslope cutthroat trout (see #28 above), with additional data on streams with genetically pure populations, according to data available from the Montana Fisheries Information System (http://fwp.mt.gov/fishing/mFish/default.html).

FF9: Elk Winter Range
This map was created by showing data on winter range for elk in Missoula County.

34. Montana Fish, Wildlife, and Parks. 2008. Elk Distribution in Montana. GIS shapefiles are available for download, and metadata are available for viewing at: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html

FF10: Deer Winter Range
This map was created by showing data on winter range for white-tailed and mule deer in Missoula County.

35. Montana Fish, Wildlife, and Parks. 2008. White-tailed Deer Distribution in Montana. GIS shapefiles are available for download, and metadata are available for viewing at: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html
36. Montana Fish, Wildlife, and Parks. 2008. Mule Deer Distribution in Montana. GIS shapefiles are available for download, and metadata are available for viewing at: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html

FF11: Bighorn Sheep and Mountain Goat
This map was created by showing data on general distribution and winter range for bighorn sheep and mountain goats in Missoula County.

37. Montana Fish, Wildlife, and Parks. 2008. Bighorn Sheep Distribution in Montana. GIS shapefiles are available for download, and metadata are available for viewing at: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html
38. Montana Fish, Wildlife, and Parks. 2008. Mountain Goat Distribution in Montana. GIS shapefiles are available for download, and metadata are available for viewing at: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html

FF12: Blackfoot-Clearwater Wildlife Management Area
This map was created by showing the portions of the Blackfoot-Clearwater Wildlife Management Area that are within Missoula County.

39. Montana Fish, Wildlife, and Parks (2009). Montana Fish, Wildlife & Parks (FWP) Wildlife Management Areas – Polygons. GIS shapefiles are available for download, and metadata are available for viewing at: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html

FF13: Important Bird Areas
This map was created by showing the Important Bird Areas that are within Missoula County.

40. National Audubon Society. 2010. Important Bird Areas. To download GIS data and obtain more information on IBA's for the state of Montana, go to http://mtaudubon.org/birds/areas.html#1.

FF14: Wildlife Highway Crossings
This map was created by combining data on wildlife highway crossing areas that have been compiled and digitized by various working groups in Missoula County (see below). Requests for GIS data for any of these data should be sent to Geodata Services ((406)532-3239; rwall@geodataservicesinc.com).

41. Ninemile Wildlife Work Group. 2007. Wildlife Highway Crossing Areas. Data were compiled by the Work Group and digitized by Geodata Services (see above).

42. Ruediger et al. 2004. An assessment of wildlife and fish linkages on Highway 93—western Montana. Forest Service Publication #R1-04-81, Missoula, MT. This report was compiled by an inter-agency work group to identify wildlife crossings on Hwy 93. Data were digitized by Geodata Services (see above).

43. Rich Clough, Cottonwood Consulting. 2008. Wildlife Highway Crossing Areas. Data were collected by Rich Clough of Cottonwood Consulting, and were digitized by Geodata Services (see above).

AQUATIC & RIPARIAN MAPS:

AR1: Lakes & Ponds
This map was created by displaying all lakes and ponds as identified in the National Hydrography Dataset (see #44 below). Data regarding TMDL and fish distribution were added to the lakes by RI/DTM.

44. US Geological Survey. 2010. National Hydrography Dataset. GIS geodatabase can be downloaded from the following website: http://nhd.usgs.gov/data.html.

45. same as #28 above

46. Montana Department of Environmental Quality. 2004. TMDL streams and lakes in Montana. Data are available for download from the following website: http://nris.state.mt.us/gis/gisdatalib/gisDataList.aspx (search for TMDL).

AR2: Rivers & Streams
This map was created by displaying all streams (#44 above) with Strahler order 2 or higher (Strahler orders calculated by RI/DTM). Fish species and TMDL data were attached to streams based on data from #45 and 46 above.

AR3: Wetlands
This map was created by showing all wetlands in Missoula County, indicating the primary wetland type.

47. US Fish and Wildlife Service. 2010. National Wetlands Inventory. GIS data are available for download and metadata at http://www.fws.gov/wetlands/Data/index.html. Updated data on new mapping for wetlands that has not yet been added to the USFWS data server may be available from the Montana Natural Heritage Program; contact http://mtnhp.org/Requests/ (mtnhp@mt.gov).

AR4: Riparian Areas
This map was created by showing all riparian areas that have been mapped in Missoula County to date; note that only a small portion of the county has been mapped, but mapping for the remainder of the county is currently underway.

48. Montana Natural Heritage Program. 2010. National Wetland Inventory Data—Riparian Areas. Requests for GIS data should be sent to http://mtnhp.org/Requests/ (mtnhp@mt.gov).

AR5: Floodplains

49. Federal Emergency Management Agency. 2009. Digital Flood Insurance Rate Map (DFIRM). Additional information can be obtained from FEMA at http://www.fema.gov/msc. Requests for GIS data in Missoula County should be directed to Missoula County Floodplain Administrator ((406)258-4657; OPG@co.missoula.mt.us).

HUMAN CONNECTIONS MAPS:

Developed Recreation Areas:
This map was created by showing recreation sites that are owned or managed by a variety of public agencies, using the following data:

50. US Forest Service—Lolo National Forest. 2009. Recreation Site Points. Data and metadata are available for download from http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5068979.htm.

51. US Forest Service—Flathead National Forest. 2009. Recreation Sites. Data and metadata are available for download from http://www.fs.fed.us/r1/flathead/gis/gis_data_index.shtml.

52. City of Missoula. 2009. Missoula City Parks. Data were obtained by RI from David Gray, Missoula County Parks and Recreation. Requests for GIS data should be directed to Missoula Parks & Recreation ((406)721-7275); parksrec@ci.missoula.mt.us).

53. Missoula County Parks Department. 2009. Missoula County Parks. Requests for GIS data should be directed to County Parks Director within Rural Initiatives ((406)258-3432; ri@co.missoula.mt.us).

54. Montana Fish, Wildlife, and Parks. 2008. State Parks. Data are available for download from the following website: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html.

55. Montana Department of Administration. 2010. Montana Cadastral Database. These data were used to identify any parcels owned by homeowners' associations or identified as common areas in Missoula County. Data are available for download from the following website: http://nris.state.mt.us/gis/gisdatalib/gisDataList.aspx.

Dispersed Recreation Areas
This map was created using data from a variety of sources to identify recreation areas that are not developed but are managed for recreation as a main goal. Data used included information from the City of Missoula (#52 above), Missoula County Parks (#53 above), and MT Dept. of Administration (#55 above), as well as the following sources:

56. US Forest Service—Lolo National Forest. 2003. Recreation Site Polygons. Data are available for download from http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5068980.htm.

57. Montana Natural Heritage Program. 2003. Designated Wilderness Areas in Montana. Data are available for download from the following website: http://nris.state.mt.us/gis/gisdatalib/gisDataList.aspx.

Public Hunting
This map was created by showing public lands and private corporate lands that are typically open for public hunting in Missoula County. Data were derived from ownership information from the Montana Natural Heritage Program (#15 above). The map does not show hunting districts, but data on hunting district boundaries are available from:

58. Montana Fish, Wildlife, and Parks. 2009. Hunting Districts (by year and by species). Data are available for download from http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html#Wil

Water Access Sites
This map shows public water access sites, and was developed by selecting any boat launches, swimming areas, and fishing access sites from Forest Service data (see #50 and 51 above), as well as data from FWP:

59. Montana Fish, Wildlife, and Parks. 2009. Fishing Access Sites- Polygons. Data are available for download from http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html#Wil.

Trails
This map shows officially managed and maintained trails in Missoula County. The data were gathered from a number of sources by Missoula County.

60. Missoula County Office of Planning and Grants. 2009. Trails in Missoula County. Data are managed by Casey Wilson. Inquiries about and requests for data should be submitted to OPG (http://www.co.missoula.mt.us/opgweb/; (406)258-4657).

Community Centers & Schools
This map shows the location of all schools in Missoula County, as well as community centers and gathering places in the rural areas of the county.

61. Montana Department of Administration. 2004. Montana Schools Database. Data are available for download from the following website: http://nris.mt.gov/nsdi/nris/shape/school2004.zip

62. Missoula County Rural Initiatives. 2009. Community Centers in Missoula County. Data were digitized by Missoula County Rural Initiatives, based on aerial photography and parcel data to identify the locations of community centers or meeting halls. Requests for GIS data should be directed to Rural Initiatives ((406)258-3432; ri@co.missoula.mt.us).

Historic Sites, Trails, & Districts

This map shows the location of historic sites and districts, either registered on the National Registry, or identified locally by the Missoula Historic Preservation Officer. Also included are data on historic trails.

63. Missoula County Office of Planning and Grants. 2006. Historic Resources Not on the National Registry. These data, provided by the Missoula Historic Preservation Officer, are maintained by Casey Wilson. Inquiries about and requests for data should be submitted to OPG ((406)258-4657; http://www.co.missoula.mt.us/opgweb/).

64. Montana Historical Society. 2005. National Register of Historic Places-- Districts and Buildings. The Montana Historical Society and the National Park Service provided data on the locations of historic sites, which were then digitized by Casey Wilson with Missoula County Office of Planning and Grants. Requests for GIS data should be submitted to OPG ((406)258-4657; http://www.co.missoula.mt.us/opgweb/).

65. Montana State Library. 2007. Geographic Names Information System (GNIS). The data were used to locate all lookout towers in Missoula County. The full GNIS database is available for download from http://nris.mt.gov/nsdi/nris/shape/gnis.zip.

66. Montana State Library. 2003. Location of Lewis and Clark Campsites in Montana. Data are available for download from http://nris.mt.gov/nsdi/nris/shape/campsites.shp.

Sites of Archaeological Interest

This map shows public land survey sections that contain sites of archaeological interest, according to information in the Montana Antiquities Database.

67. Montana State Historic Preservation Office. 2009. Montana Cultural Resource Information System (CRIS). Data on sections with sites of interest can be downloaded using the Montana Digital Atlas, available at http://maps2.nris.mt.gov/mapper/. Requests for metadata and/or additional information should be directed to the Montana Historic Preservation Office ((406)444-7767; dmurdo@mt.gov).

Appendix B: Animal Species of Concern

Montana animal Species of Concern (SOC) are native Montana animals that are considered to be “at risk” due to declining population trends, threats to their habitats, and/or restricted distribution. The Montana Natural Heritage Program (MTNHP) serves as the state’s information source for animals, plants, and plant communities with a focus on species and communities that are rare, threatened, and/or have declining trends and as a result are at risk of extinction in Montana. MTNHP and the Montana Department of Fish, Wildlife, and Parks jointly produce a report on Montana Animal Species of Concern.

The Conservation Resource Atlas provides maps for some animal Species of Concern (Canada lynx, grizzly bears, bull trout, bald eagles, common loons, and westslope cutthroat). These species were included because they are potentially affected by land use and development and because data currently exists to map potential habitat for these species. However, many SOC exist or potentially exist in Missoula County that are not included in this atlas. This appendix lists animal SOC and their statewide and global ranking (see tables). Site-specific analysis will help identify additional SOC when reviewing subdivision and Open Space Bond projects. In addition, Montana Fish Wildlife and Park’s Crucial Areas Planning System can identify other SOC in a project area (http://fwp.mt.gov/wildthings/conservationInAction/crucialAreas.html).

Note: This information comes from the Montana Natural Heritage Program’s Website: http://mtnhp.org/default.asp. MTNHP continually updates their database; for more up-to-date information directly consult with MTNHP.

Table 1. State of Montana Ranking System

Global Rank	State Rank	Definition
G1	**S1**	At high risk because of **extremely limited** and/or **rapidly declining** population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.
G2	**S2**	At risk because of **very limited** and/or **potentially declining** population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.
G3	**S3**	Potentially at risk because of **limited** and/or **declining** numbers, range and/or habitat, even though it may be abundant in some areas.
G4	**S4**	Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.
G5	**S5**	Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range.
GX	**SX**	Presumed Extinct or Extirpated - Species is believed to be extinct throughout its range or extirpated in Montana. Not located despite intensive searches of historical sites and other appropriate habitat, and small likelihood that it will ever be rediscovered.
GH	**SH**	Historical, known only from records usually 40 or more years old; may be rediscovered.
GNR	**SNR**	Not Ranked as of yet.
GU	**SU**	Unrankable - Species currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
GNA	**SNA**	A conservation status rank is not applicable for one of the following reasons: 1) The taxa is of Hybrid Origin; is Exotic or Introduced; is Accidental or 2) is Not Confidently Present in the state. (see other codes below)

A Combination or Range Ranks, such as G#G# or S#S# Indicates a range of uncertainty about the status of the species.e.g. G1G3 = Global Rank ranges between G1 and G3 inclusive

Table 2. Animal Species of Concern that are known to exist or for which habitat exists in Missoula County[1]

Group	Scientific Name	Common Name	General Habitat Description	Global	MT
Mammals	*Canis lupus*	Gray Wolf	Generalist	G4	S3
	Corynorhinus townsendii	Townsend's Big-eared Bat	Caves in forested habitats	G4	S2
	Gulo gulo	Wolverine	Conifer forest	G4	S3
	*Lynx canadensis** @	Canada Lynx* @	Subalpine conifer forest	G5	S3
	Martes pennanti	Fisher	Mixed conifer forests	G5	S3
	Myotis thysanodes	Fringed Myotis	Riparian and dry mixed conifer forests	G4G5	S3
	Sorex preblei	Preble's Shrew	Sagebrush grassland	G4	S3
	Synaptomys borealis	Northern Bog Lemming	Conifer forest wetland	G4	S2
	*Ursus arctos** @	Grizzly Bear* @	Conifer forest	G4	S2S3
Birds	*Accipiter gentilis*	Northern Goshawk	Mixed conifer forests	G5	S3
	Ammodramus savannarum	Grasshopper Sparrow	Grasslands	G5	S3B
	Aquila chrysaetos	Golden Eagle	Grasslands	G5	S3
	Ardea herodias	Great Blue Heron	Riparian forest	G5	S3
	Botaurus lentiginosus	American Bittern	Wetlands	G4	S3B
	Buteo regalis	Ferruginous Hawk	Sagebrush grassland	G4	S3B
	Carpodacus cassinii	Cassin's Finch	Conifer forest	G5	S3
	Catharus fuscescens	Veery	Riparian forest	G5	S3B
	Certhia americana	Brown Creeper	Moist conifer forests	G5	S3
	Coccyzus americanus	Yellow-billed Cuckoo	Prairie riparian forest	G5	S3B
	Dolichonyx oryzivorus	Bobolink	Moist grasslands	G5	S3B
	Dryocopus pileatus	Pileated Woodpecker	Moist conifer forests	G5	S3
	Falco peregrinus	Peregrine Falcon	Cliffs / canyons	G4	S3
	*Gavia immer**	Common Loon*	Mountain lakes w/ emergent vegetation	G5	S3B
	Gymnorhinus cyanocephalus	Pinyon Jay	Conifer forest	G5	S3
	*Haliaeetus leucocephalus**	Bald Eagle*	Riparian forest	G5	S3
	Histrionicus histrionicus	Harlequin Duck	Mountain streams	G4	S2B
	Lagopus leucura	White-tailed Ptarmigan	Alpine	G5	S3
	Leucosticte atrata	Black Rosy-Finch	Alpine	G4	S2
	Melanerpes lewis	Lewis's Woodpecker	Riparian forest	G4	S2B
	Nucifraga columbiana	Clark's Nutcracker	Conifer forest	G5	S3
	Otus flammeolus	Flammulated Owl	Dry conifer forest	G4	S3B
	Picoides arcticus	Black-backed Woodpecker	Conifer forest burns	G5	S3
	Strix nebulosa	Great Gray Owl	Conifer forest	G5	S3
	Troglodytes troglodytes	Winter Wren	Moist conifer forests	G5	S3
Reptiles	*Elgaria coerulea*	Northern Alligator Lizard	Talus slopes / rock outcrops	G5	S3

1. based in information from the Montana Natural Heritage Program
Species featured in the atlas are in red with an* symbol
An @ symbol indicates a species is listed under the 1973 Endangered Species Act

Table 2. Animal Species of Concern (Continued)

Group	Scientific Name	Common Name	General Habitat Description	Global	MT
	Eumeces skiltonianus	Western Skink	Rock outcrops	G5	S3
Amphibians	*Bufo boreas*	Western Toad	Wetlands, floodplain pools	G4	S2
	Plethodon idahoensis	Coeur d'Alene Salamander	Spring / seep, waterfall, fractured rock	G4	S2
Fish	*Oncorhynchus clarkii lewisi**	Westslope Cutthroat Trout*	Mountain streams, rivers, lakes	G4T3	S2
	*Salvelinus confluentus** @	Bull Trout* @	Mountain streams, rivers, lakes	G3	S2
Invertebrates	*Euphydryas gillettii*	Gillette's Checkerspot	Wet meadows	G2G3	S2
	Goereilla baumanni	Northern Rocky Mountains Refugium Caddisfly	Forested mountain springs	G2	S2
	Rossiana montana	Northern Rocky Mountains Refugium Caddisfly	Forested mountain springs	G2G3	S2
	Caurinella idahoensis	Lolo Mayfly	Small forested mountain streams	G3	S2
	Soyedina potteri	Northern Rocky Mountains Refugium Stonefly	Small forested mountain streams	G2	S2
	Zapada cordillera	A Stonefly	Alpine / Mountain streams	G3	S2
	Hemphillia camelus	Pale Jumping-slug	Mesic / moist conifer forests	G4	S1S2
	Magnipelta mycophaga	Magnum Mantleslug	Moist conifer forests	G3	S2S3
	Margaritifera falcata	Western Pearlshell	Mountain streams, rivers	G4G5	S2
	Oreohelix alpina	Alpine Mountainsnail	Limestone talus, alpine	G1	S1
	Oreohelix amariradix	Bitterroot Mountainsnail	Talus, dry conifer forests	G1G2	S1S2
	Oreohelix carinifera	Keeled Mountainsnail	Limestone, dry conifer forests	G1	S1
	Oreohelix haydeni	Lyrate Mountainsnail		G2G3	S1S3
	Prophysaon humile	Smoky Taildropper	Moist conifer forests	G3	S2S3
	Udosarx lyrata	Lyre Mantleslug	Moist conifer forests	G2	S1
	Zacoleus idahoensis	Sheathed Slug	Mesic / moist conifer forests	G3G4	S2S3
	Stygobromus tritus	A Subterranean Amphipod	Cave springs	G1G2	S1S2
	Ephydatia cooperensis	A Freshwater Sponge	Lakes	G1G3	S1S3
	Adrityla cucullata	A Millipede	Dry mixed conifer forest clearings	G1G3	S1S3
	Austrotyla montani	A Millipede	Mixed conifer forests	G1G3	S1S3
	Corypus cochlearis	A Millipede	Mixed conifer forests	G1G3	S1S3
	Lophomus laxus	A Millipede	Mixed conifer forests	G1G3	S1S3

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Appendix C: Plant Species of Concern

Montana plant Species of Concern (SOC) are native Montana plants that are considered to be “at risk” due to declining population trends, threats to their habitats, and/or restricted distribution. The Montana Natural Heritage Program (MTNHP) serves as the state’s information source for animals, plants, and plant communities with a focus on species and communities that are rare, threatened, and/or have declining trends and as a result are at risk of extinction in Montana. MTNHP and the Montana Department of Fish, Wildlife, and Parks jointly produce a report on Montana plant Species of Concern.

The Conservation Resource Atlas provides a maps for non-Endangered Species Act listed plant Species of Concern (pg. 19) and endangered Water Howellia (pg. 17). Table 2. lists these species and their statewide and global ranking (see the following tables). Site-specific analysis will help identify Species of Concern when reviewing subdivision and Open Space Bond projects. These species were included because they are potentially affected by land use and development and because data currently exists to map potential habitat for these species. However, many SOC exist or potentially exist in Missoula County that are not included in this atlas. Table 2. in this appendix lists plant SOC and their statewide and global ranking (see table 1. for a description of this ranking system). Site-specific analysis will help identify additional SOC when reviewing subdivision and Open Space Bond projects.

Note: This information comes from the Montana Natural Heritage Program’s Website: http://mtnhp.org/default.asp. MTNHP continually updates their database; for more up-to-date information directly consult with MTNHP.

Table 1. State of Montana Ranking System

Global Rank	State Rank	Definition
G1	**S1**	At high risk because of **extremely limited** and/or **rapidly declining** population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.
G2	**S2**	At risk because of **very limited** and/or **potentially declining** population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.
G3	**S3**	Potentially at risk because of **limited** and/or **declining** numbers, range and/or habitat, even though it may be abundant in some areas.
G4	**S4**	Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.
G5	**S5**	Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range.
GX	**SX**	Presumed Extinct or Extirpated - Species is believed to be extinct throughout its range or extirpated in Montana. Not located despite intensive searches of historical sites and other appropriate habitat, and small likelihood that it will ever be rediscovered.
GH	**SH**	Historical, known only from records usually 40 or more years old; may be rediscovered.
GNR	**SNR**	Not Ranked as of yet.
GU	**SU**	Unrankable - Species currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
GNA	**SNA**	A conservation status rank is not applicable for one of the following reasons: 1) The taxa is of Hybrid Origin; is Exotic or Introduced; is Accidental or 2) is Not Confidently Present in the state. (see other codes below)

G indicates a species global ranking and S indicates its ranking in Montana. A Combination or Range Ranks, such as G#G# or S#S# Indicates a range of uncertainty about the status of the species. e.g. G1G3 = Global Rank ranges between G1 and G3 inclusive

Table 2. Plant Species of Concern that are known to exist or for which habitat exists in Missoula County[1]

Group	Scientific Name	Common Name	Global	MT
Ferns and Fern Allies	*Botrychium crenulatum*	Wavy Moonwort	G3	S2S3
	Botrychium montanum	Mountain Moonwort	G3	S3
	Botrychium sp. (SOC)	Moonworts	G1G3	S1S3
	Dryopteris cristata	Crested Shieldfern	G5	S2
	Lycopodium inundatum	Northern Bog Clubmoss	G5	S1
	Ophioglossum pusillum	Adder's Tongue	G5	S2
Flowering Plants	*Bidens beckii*	Beck Water-marigold	G4G5	S2
	Brasenia schreberi	Watershield	G5	S1S2
	Camissonia andina	Obscure Evening-primrose	G4	S1
	Cardamine rupicola	Cliff Toothwort	G3	S3
	Castilleja cervina	Deer Indian Paintbrush	G4	SH
	Centunculus minimus	Chaffwe ed	G5	S2
	Collomia debilis var. camporum	Flexible Collomia	G5T2	S1
	Drosera anglica	English Sundew	G5	S2S3
	Erigeron linearis	Linear-leaf Fleabane	G5	S1
	Gentianopsis simplex	Hiker's Gentian	G5	S1
	Grindelia howellii	Howell's Gumweed	G3	S2S3
	Howellia aquatilis@	Water Howellia@	G3	S2
	Mertensia bella	Oregon Bluebells	G4	S1
	Nymphaea leibergii	Pygmy Water-lily	G5	S1
	Phlox kelseyi var. missoulensis	Missoula Phlox	G2G3	S2S3
	Rotala ramosior	Toothcup	G5	S1
	Satureja douglasii	Yerba Buena	G4	S2
	Synthyris canbyi	Mission Mountain kittentails	G3	S3
	Waldsteinia idahoensis	Idaho Barren Strawberry	G3	S1
	Calamagrostis tweedyi	Cascade reedgrass	G3	S3
	Carex rostrata	Glaucus Beaked Sedge	G5	S1
	Carex scoparia	Pointed Broom Sedge	G5	S1S2
	Cyperus bipartitus	Shining Flatsedge	G5	S1
	Cypripedium fasciculatum	Clustered Lady's-slipper	G4	S2
	Eriophorum gracile	Slender Cottongrass	G5	S2
	Juncus covillei	Coville's Rush	G5	S1
	Potamogeton obtusifolius	Blunt-leaved Pondweed	G5	S2
	Scheuchzeria palustris	Pod Grass	G5	S2
	Schoenoplectus subterminalis	Water Bulrush	G4G5	S2
	Wolffia columbiana	Columbia Water-meal	G5	S2

1. based in information from the Montana Natural Heritage Program

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Table 2. Plant Species of Concern (Continued)

Group	Scientific Name	Common Name	Global	MT
Bryophytes	*Scorpidium scorpioides*	Scorpidium moss	G4G5	S2
	Sphagnum magellanicum	Magellan's Peatmoss	G5	S1
	Sphagnum mendocinum	Mendocino Peatmoss	G4	S1
	Sphagnum riparium	Streamside Sphagnum moss	G5	S1
Lichens	*Arctoparmelia subcentrifuga*	Ring Lichen	G4G5	S1
	Lobaria hallii	Gray Lungwort Lichen	G4?	S2
	Normandina pulchella	Elf-ear Lichen	G3G5	S1
	Parmeliella triptophylla	Lead Lichen	G3G5	S1
	Peltigera hydrothyria	Waterfan Lichen	G4	S1
	Solorina bispora	Chocolate Chip Lichen	G3G5	S1S2