

APPENDIX E

Acronyms-Abbreviations, Online Resources, & Glossary



ACRONYMS AND ABBREVIATIONS USED IN THIS STRATEGY

| | |
|----------------|--|
| ACEC | Area of Critical Environmental Concern |
| ACEP | Agricultural Conservation Easement Programs |
| ALE | Agricultural Land Easements |
| ASBA | American Society of Botanical Artists |
| ASLA | American Society of Landscape Architects |
| BDNF | Beaverhead-Deerlodge National Forest Herbarium |
| BHDL NF | Beaverhead-Deerlodge National Forest |
| BIA | Bureau of Indian Affairs |
| BLM | Bureau of Land Management |
| BNFH | Bitterroot National Forest Herbarium |
| BRF | Bitterroot National Forest |
| CBH | Consortium of Bryophyte Herbaria |
| CCAA | Candidate Conservation Agreement and Assurances |
| CCC | Civilian Conservation Corps |
| CCVI | Climate Change Vulnerability Index |
| CE | Conservation Easement |
| CFRTAC | Clark Fork River Technical Assistance Committee |
| CLH | Consortium of Lichen Herbaria |
| CNGPH | Consortium of Northern Great Plains Herbaria |
| CPNWH | Consortium of Pacific Northwest Herbaria |
| CRP | Conservation Reserve Program |
| CSKT | Confederated Salish and Kootenai Tribes |
| CSP | Conservation Stewardship Program |
| CVA | Centennial Valley Association |
| ECOS | (USFWS) Environmental Conservation Online Systems |
| EO | Element Occurrence |
| EQIP | Environmental Quality Incentive Program |
| ES | Ecological System |
| ESA | Endangered Species Act |
| FOH | Friends of the Herbarium |
| GBIF | Global Biodiversity Information Facility |
| GCN | Greatest Conservation Need |
| GFC | Tu-Hi Hong and Pum-Hi Hong Herbarium at Great Falls |
| GIS | Geographic Information System |
| GLAC | Glacier National Park Herbarium |
| GNP | Glacier National Park |
| GPI | Great Plains Institute |
| iDigBio | Integrated Digitized BioCollections |
| IDNHP | Idaho Natural Heritage Program |
| IPA | Important Plant Area Program |
| ITEK | Indigenous Traditional Ecological Knowledge |
| IUCN | International Union for Conservation of Nature |
| JACQ | jointly administered herbaria system of dozens of herbaria |
| LiDAR | Light Detection and Ranging |
| MDA | Montana Department of Agriculture |
| MEPA | Montana Environmental Policy Act |

| | |
|-----------------------|--|
| MFWP | Montana Fish, Wildlife & Parks |
| MISC | Montana Invasive Species Council |
| MNPS | Montana Native Plant Society |
| MONT | Montana State University Herbarium |
| MONTU | University of Montana Herbarium |
| MRC | Missoula Research Center Herbarium |
| MSUB | Montana State University Herbarium at Billings |
| MT/Dakotas BLM | Montana/Dakotas Bureau of Land Management |
| MTDEQ | Montana Department of Environmental Quality |
| MTDNRC | Montana Department of Natural Resources & Conservation |
| MTNHP | Montana Natural Heritage Program |
| MTNSN | Montana Native Seed Network |
| MUS | Montana University System |
| MWCA | Montana Weed Control Association |
| NEPA | National Environmental Policy Act |
| NF | National Forest |
| NGO | Non-governmental Organization |
| NPS | National Park Service |
| NRCS | Natural Resources Conservation Service |
| NRDP | Natural Resource Damage Program |
| NVCS | National Vegetation Classification System |
| NWR | National Wildlife Refuge |
| PSGIN | Plant Species of Greatest Inventory Need |
| PSOC | Potential Species of Concern |
| RAWA | Recovering America's Wildlife Act |
| RNA | Research Natural Areas |
| RTRL | Reserved Treaty Rights Lands |
| SEINet | regional network of North American herbaria |
| SFI | Sustainable Forestry Initiative |
| SHPO | State Historical Preservation Office |
| SO | Species Occurrence |
| SOC | Species of Concern |
| SSA | Species Status Assessment |
| SWAP | State Wildlife Action Plan |
| TEK | Traditional Ecological Knowledge |
| THPO | Tribal Historic Preservation Officers |
| TK | Traditional Knowledge |
| TNC | The Nature Conservancy |
| USDA | United States Department of Agriculture |
| USDI | United States Department of the Interior |
| USFS | United States Forest Service |
| WHIP | Wildlife Habitat Improvement Program |
| WMA | Wildlife Management Area |
| WNPS | Washington Native Plant Society |
| WPBR | White Pine Blister Rust |
| WRE | Wetland Reserve Easements |
| YELLO | Yellowstone National Park Herbarium |
| YNP | Yellowstone National Park |

ONLINE RESOURCES CITED IN THIS STRATEGY

ASSOCIATIONS, LAND TRUSTS, CONSERVATION DISTRICTS, COUNCILS, & PRIVATE LAND STEWARDS

Centennial Valley Association <https://www.centennialvalleyassociation.org>

Gallatin Valley Land Trust <https://gvlr.org/>

Montana Association of Conservation Districts <https://macdnet.org/>

The Montana Conservationist <https://macdnet.org/category/the-montana-conservationist/>

Montana Association of Land Trusts <https://montanalandtrusts.org/>

Montana Rangelands Partnership <http://montanarangelandspartnership.org/>

Montana Rangelands Group <https://storymaps.arcgis.com/stories/dca926ecbe044682b66767b4db176bd8>

Montana Watershed Coordination Council <https://www.mtwatersheds.org/>

Watershed News <https://www.mtwatersheds.org/resources/watershed-news/>

Montana Weed Control Association <https://www.mtweed.org/>

North American Invasive Species Management Association (NAISMA) <https://naisma.org/>

SOCIETIES, CONSERVATION ORGANIZATIONS, & OTHER NON-PROFITS

Adventure Scientists <https://www.adventurescientists.org/>

American Society of Botanical Artists (ASBA) <https://www.asba-art.org/>

American Society of Landscape Architects (ASLA) <https://www.asla.org/>

An Assessment of Native Seed Needs and Capacities-2023

<https://www.nationalacademies.org/our-work/an-assessment-of-native-seed-needs-and-capacities>

California Native Plant Society (CNPS) <https://www.cnps.org/>

CNPS Field/Consulting Certified Botanist <https://www.cnps.org/education/botanist-certification>

Eriogonum Society <https://eriogonum.info>

Great Plains Institute (GPI) <https://betterenergy.org/>

Homegrown National Park <https://homegrownnationalpark.org/about-us/>

iNaturalist <https://www.inaturalist.org/>

International Union for Conservation of Nature (IUCN) <https://www.iucn.org/>

Montana Audubon Society <https://mtaudubon.org>

Montana Audubon Center (Master Naturalist Program) <https://mtaudubon.org/center/>

Montana Audubon Society Monthly E-News <https://mtaudubon.org/news>

Montana Discovery Foundation (Master Naturalist Program)

<http://www.montanadiscoveryfoundation.org/>

Montana Native Plant Society (MNPS) <https://mntnativeplants.org/>

Conservation Committee <https://mntnativeplants.org/conservation-issues/>

Conservation Conference <https://mntnativeplants.org/conservation-conference/>

Germination of Wildland Collected Seeds

<https://mntnativeplants.org/wp-content/uploads/2022/03/MNPS-Wild-Seed-Germination-Paper-draft.pdf>

Kelseya Archive <https://mntnativeplants.org/archive/>

Important Plant Areas (IPA) <https://mntnativeplants.org/important-plant-areas/>

Montana Native Plant Source Guide <https://mntnativeplants.org/native-plant-landscaping/#>

MNPS Collecting Guidelines <https://mntnativeplants.org/wp-content/uploads/2018/07/MNPS-Guidelines-for-Collecting-Native-Plants-.pdf>

MNPS Plant Collecting Guidelines for Teachers

<https://mntnativeplants.org/wp-content/uploads/2018/07/MNPS-Plant-Collection-Guidelines-for-Teachers.pdf>

Native Plant Landscaping <https://mntnativeplants.org/native-plant-landscaping/>

Montana Natural History Center (Master Naturalist Program) <https://www.montanaturalist.org/>

Northwest Lichenologists' Certification <https://northwest-lichenologists.wildapricot.org/page-1854204>

Penstemon Society <https://penstemons.org/index.php>
Plant Conservation Alliance <https://www.plantconservationalliance.org/welcome>
Pollinator Partnership <https://pollinator.org/guides>
Pollinator Steward Certification <https://www.pollinator.org/psc>
Pull Your Share Movement <https://www.pullyourshare.com/>
Society for Range Management <https://rangelands.org>
Sustainable Forestry Initiative <https://forests.org/>
Swan Valley Connections (Master Naturalist Program) <https://www.swanvalleyconnections.org/>
The Nature Conservancy (TNC) <https://www.nature.org/en-us/>
The Nature Conservancy Magazine <https://www.nature.org/en-us/magazine/>
The Wildlife Society <https://wildlife.org/>
Washington Native Plant Society <https://www.wnps.org/plant-lists>
Xerces Society <https://www.xerces.org/pollinator-resource-center>

BOTANIC GARDENS

Botanic Gardens Conservation International (BGCI) <https://www.bgci.org/>
BGCI Global Strategy for Plant Conservation <https://www.bgci.org/our-work/inspiring-and-leading-people/policy-and-advocacy/the-global-strategy-for-plant-conservation/>
Denver Botanic Gardens <https://www.botanicgardens.org/>
Strategy for Alpine Plant Conservation <https://alpinestrategy.org/>
State of Montana Arboretum <https://www.umt.edu/arboretum/>
University of Washington Botanic Gardens <https://botanicgardens.uw.edu/>
Rare Care <https://botanicgardens.uw.edu/science-conservation/rarecare/>

HERBARIA, CONSORTIUMS, & SUPPORTING ORGANIZATIONS

Bitterroot National Forest Herbarium (BNFH)
<https://nansh.org/portal/collections/misc/collprofiles.php?collid=119>
Consortium of Bryophyte Herbaria (CBH) <https://bryophyteportal.org/portal/>
Consortium of Lichen Herbaria (CLH) <https://bryophyteportal.org/portal/>
Consortium of Northern Great Plains Herbaria (CNGPH) <https://ngpherbaria.org/portal/>
Consortium of Pacific Northwest Herbaria (CPNWH) <https://www.pnwherbaria.org/data/search.php>
Glacier National Park Herbarium (GLAC) <https://www.nps.gov/glac/learn/historyculture/collections.htm>
Index Herbariorum <https://sweetgum.nybg.org/science/ih/>
JACQ (jointly administered herbaria system) <https://www.jacq.org/>
Rae Selling Berry Seed Bank <https://www.pdx.edu/seed-bank/>
SEINet (regional network of North American herbaria) <https://symbiota.org/seinet/>
University of Montana Herbarium (MONTU) <https://hs.umt.edu/herbarium/default.php>
How to Press a Plant <https://www.umt.edu/herbarium/documents/education/how-press-plants.pdf>
Friends of the University of Montana Friends Herbarium (FOH)
<https://www.umt.edu/herbarium/friends-of-the-herbarium/>
Yellowstone National Park (YELLO) Herbarium <https://www.nps.gov/yell/learn/nature/herbarium.htm>

DATA AGGREGATORS

Global Biodiversity Information Facility (GBIF) <https://www.gbif.org/>
iDigBio <https://www.idigbio.org/>

OTHER RESOURCES: PUBLICATIONS, VIDEO, TRAINING, CERTIFICATION, & TOOLS

Fire in the West: Aspen & Fire, A Burning Issue <https://www.youtube.com/watch?v=6A3LLW6evk>

Guide to Quaking Aspen Ecology and Management with emphasis on BLM Lands in the Western US <https://qcnr.usu.edu/western-aspen-alliance/files/aspen-field-guide.pdf>

LANDFIRE (a program of the USDI and USDA-FS) <https://landfire.gov/index.php>

Measuring and Monitoring Plant Populations (Elzinga et al. 1998)
<https://www.ntc.blm.gov/krc/legacy/course/265>

Montana Climate Assessment 2017 and 2021 reports <https://montanaclimate.org/>

Climate Wizard <https://www.climatehubs.usda.gov/hubs/southwest/tools/climate-wizard>

Northwest Lichenologists' Certification <https://northwest-lichenologists.wildapricot.org/page-1854204>

Montana Native Plants for Pollinator-Friendly Plantings
<https://www.nrcs.usda.gov/plantmaterials/mtpmcb1694.pdf>

US National Vegetation Classification <https://usnvc.org/>

Wetland Training Institute <https://wetlandtraining.com/>

MONTANA TRIBES, SUPPORTING ORGANIZATIONS, & PUBLICATION

Apsaalooke Nation (Crow Tribe) <http://www.crow-nsn.gov>

Blackfeet Nation <https://blackfeetnation.com/>

Chippewa Cree Tribe of Rocky Boy Montana www.facebook.com/ChippewaCree

Confederated Salish and Kootenai Tribes <https://csktribes.org/>

Fort Belknap Indian Community <https://ftbelknap.org>

Fort Belknap Partnership for Restoration <https://www.blm.gov/programs/natural-resources/native-plant-communities/about-native-plants/montana/fortbelknap>

Fort Peck Tribes <https://fortpecktribes.org>

Mission Mountains Youth Crew Program <https://www.nationalforests.org/regional-programs/northern-rockies/mission-mountains-youth-crew-program>

Montana Little Shell Chippewa <https://montanalittleshelltribe.org/>

Montana Governor's Office of Indian Affairs <https://tribalnations.mt.gov/>

Northern Cheyenne Tribe www.cheyennenation.com

The Status of Tribes and Climate Change Report (STACCGW 2021)
https://www7.nau.edu/itep/main/docs/publications/ITEP.STACC.Report_2021.pdf

US Department of Justice Office of Tribal Justice-Native American Policies
<https://www.justice.gov/otj/native-american-policies>

STATE & FEDERAL SERVICE ORGANIZATIONS

Americorps State Programs in Montana <https://serve.mt.gov/ameriCorps/ameriCorps-programs>

Montana Conservation Corps <https://www.mtcorps.org/>

NATURAL HERITAGE PROGRAMS & NETWORK

Idaho Natural Heritage Program <https://idfg.idaho.gov/conservation/natural-heritage-program>

Montana Natural Heritage Program (MTNHP) <https://mtnhp.org/>

Map Viewer <https://mtnhp.org/mapviewer/>

Montana Field Guide <https://fieldguide.mt.gov/>

NatureServe <https://www.natureserve.org/>

NatureServe Explorer <https://explorer.natureserve.org/>

US National Vegetation Classification <https://usnvc.org/>

Nebraska Natural Heritage Program

<https://outdoornebraska.gov/conservation/conservation-efforts/natural-heritage-program/>

UNIVERSITIES

Montana State University Extension Services <https://www.montana.edu/extension/localoffices.html>

Schutter Diagnostic Lab <https://www.montana.edu/extension/diagnostics/>

Portland State University

Rae Selling Berry Seed Bank <https://www.pdx.edu/seed-bank/>

Utah State University

Western Aspen Alliance <https://qcnr.usu.edu/western-aspen-alliance/>

WAA Aspen Briefs <https://qcnr.usu.edu/western-aspen-alliance/briefs/>

University of Montana

State of Montana Arboretum <https://www.umt.edu/arboretum/>

University of Washington

Rare Care <https://botanicgardens.uw.edu/science-conservation/rarecare/>

STATE OF MONTANA AGENCIES

Institute of Museum and Library Science <https://www.imls.gov/>

Montana Department of Agriculture (MDA) <https://agr.mt.gov/>

Montana Noxious Weed Management Plan

<https://agr.mt.gov/docs/NWTF-docs/MT-Noxious-Weed-Management-Plan--Update-2017.pdf>

Montana Weed Control Association <https://www.mtweed.org/>

Montana Department of Commerce

Montana Resiliency Plan <https://redesign-commerce.mt.gov/Business/Programs-and-Services/Tourism-Marketing/Tourism-Grant-Program/Resiliency-Plan-Implementation-Grant-Program>

Montana Department of Environmental Quality <https://deq.mt.gov/>

Montana Wetland Council <https://deq.mt.gov/Water/Programs/wetlands>

Montana Department of Natural Resources and Conservation (DNRC)

Conservation Seedling Nursery <https://dnrc.mt.gov/Forestry/Conservation-Nursery/>

Forestry Assistance and Trust Lands Division <https://dnrc.mt.gov/TrustLand/>

Montana Forest Action Plan (Montana Forest Action Advisory Council 2020)

https://dnrc.mt.gov/docs/forestry/Montana_Forest_Action_Plan_12.22.2020.pdf

Montana Native Seed Network <https://dnrc.mt.gov/Forestry/Conservation-Nursery/Native-Seed-Program>

Montana Fish, Wildlife and Parks (MFWP)

Candidate Conservation Agreement and Assurances

<https://fwp.mt.gov/conservation/fisheries-management/arctic-grayling>

CleanDrainDry <https://fwp.mt.gov/conservation/aquatic-invasive-species>

Future Fisheries Improvement Program <https://fwp.mt.gov/ffip>

Habitat Conservation Lease Program <https://fwp.mt.gov/conservation/habitat/habitat-conservation/lease-program>

Habitat Montana <https://fwp.mt.gov/conservation/landowner-programs/habitat-montana>

Migratory Bird Wetland Program <https://fwp.mt.gov/conservation/habitat/migratory-bird-wetland-program>

Montana WILD <https://fwp.mt.gov/education/montana-wild>

PlayCleanGo <https://playcleango.org/>

State Wildlife Action Plan (MFWP 2015)

<https://fwp.mt.gov/binaries/content/assets/fwp/gisresources/docs/swap/70169.pdf>

Wildlife Habitat Improvement Program

<https://fwp.mt.gov/aboutfwp/grant-programs/wildlife-habitat-improvement>

Montana Historical Society <https://mhs.mt.gov/>

Montana the Magazine of Western History <https://mhs.mt.gov/pubs/Magazines/>

The Montana Historic Preservation Plan, 2023-2027

https://mhs.mt.gov/Shpo/docs/MontanaStatePlan_2023_2027.pdf

Montana Invasive Species Council <https://invasivespecies.mt.gov/misc/about-us>

Montana Department of Labor & Industry <https://dli.mt.gov/>

FEDERAL AND INTERNATIONAL GOVERNMENT & SUPPORTING NON-PROFIT ORGANIZATIONS

National Forest Foundation <https://www.nationalforests.org/>

National Science Foundation <https://www.nsf.gov/>

National Sustainable Agriculture Coalition <https://sustainableagriculture.net/>

What is the Farm Bill <https://sustainableagriculture.net/our-work/campaigns/fbcampaign/what-is-the-farm-bill/>

Natural Resources Conservation Service (NRCS) <https://www.nrcs.usda.gov/>

ACEP ALE and WRE <https://www.nrcs.usda.gov/programs-initiatives/acep-agricultural-conservation-easement-program/montana/agricultural>

Bridger Plant Materials Center, Montana <https://www.nrcs.usda.gov/plant-materials/mtpmc>

Montana Native Plants for Pollinator-Friendly Plantings
<https://www.nrcs.usda.gov/plantmaterials/mtpmcbr11694.pdf>

Plant Conservation Alliance <https://www.plantconservationalliance.org/welcome>

United Nations. 2023. What is Climate Change? <https://www.un.org/en/climatechange/what-is-climate-change>

US Department of Agriculture (USDA) - Agriculture Research Service

<https://www.ars.usda.gov/pacific-west-area/pullman-wa/plant-germplasm-introduction-and-testing-research/docs/facilities-pullman-seed-storage/>

US Forest Service (USFS)

Celebrating Wildflower Program <https://www.fs.usda.gov/managing-land/wildflowers>

Climate Change Vulnerability and Adaptation in the Northern Rockies
https://www.fs.usda.gov/rm/pubs_series/rmrs/gtr/rmrs_gtr374_1.pdf

Montana Discovery Foundation <http://www.montanadiscoveryfoundation.org/>

Celebrating Wildflowers <https://www.montanadiscoveryfoundation.org/programs/celebrating-wildflowers/>

Adopt-A-Species <https://www.montanadiscoveryfoundation.org/programs/adopt-a-species/>

Native Plant Materials Strategic Framework (2012)
https://www.fs.usda.gov/wildflowers/Native_Plant_Materials/policy.shtml

Native Plant Restoration Program https://www.fs.usda.gov/wildflowers/Native_Plant_Materials/policy.shtml

Pollinators and native Wildflowers <https://www.fs.usda.gov/wildflowers/pollinators/>

Rocky Mountain Research Station <https://www.fs.usda.gov/rmrs/groups/western-center-native-plant-conservation-and-restoration-science>

Vipond Park <https://www.fs.usda.gov/wildflowers/regions/northern/VipondPark/index.shtml>

Bureau of Indian Affairs (BIA) <https://www.bia.gov/>

Bureau of Land Management (BLM)

Fort Belknap Partnership for Restoration: <https://www.blm.gov/programs/natural-resources/native-plant-communities/about-native-plants/montana/fortbelknap>

Seeds of Success Guides and Training Resources <https://www.blm.gov/programs/natural-resources/native-plant-communities/native-plant-and-seed-material-development/collection>

National Seed Strategy-Business Plan https://www.blm.gov/sites/blm.gov/files/uploads/programs_natural-resources_native-plant-communities_national-seed-strategy_NSS-BUSINESS-PLAN.pdf

National Seed Strategy-Rehabilitation and Restoration https://www.blm.gov/sites/default/files/docs/2020-12/NationalSeedStrategy_2015-2020.pdf

US Department of Justice Office of Tribal Justice-Native American Policies

<https://www.justice.gov/otj/native-american-policies>

US Fish and Wildlife Service (USFWS)

Pollinators <https://www.fws.gov/initiative/pollinators>

Endangered Species <https://www.fws.gov/program/endangered-species>

Recovery Outline for Whitebark Pine **Link will be removed when Recovery Plan is posted.
https://ecos.fws.gov/docs/recovery_plan/20221215_WBP_Final_Recovery_Outline_v11_DRDsigned.pdf

US National Park Service <https://www.nps.gov/index.htm>

GLOSSARY

Advancing Succession:

The process of change in the species composition, structure, or architecture of vegetation in an ecological community over time. In the absence of disturbance, vegetation succession advances when one community type gives way to another community type.

Area of Critical Environmental Concern (ACEC):

The ACEC program was established in the 1976 Federal Lands Policy and Management Act and is managed by the Bureau of Land Management (BLM). Places designated as ACECs require special management to protect important historical, cultural, and scenic values, fish and wildlife, or other natural resources (BLM 2021). An ACEC is a type of Research Natural Area (RNA).

Biodiversity:

Short for biological diversity. The variety of life on Earth at all levels, from genes to ecosystems, that encompass the evolutionary, ecological, and cultural processes that sustain life. Biodiversity is usually measured in the number of species, but can be quantified by genetic variability, ecosystem diversity, and phylogenetic diversity.

Botanical Capacity:

The human, scientific, technological, organizational, institutional, and resource capabilities that support plant-based education and training, basic and applied research and environmental monitoring and management. See Box 3-1 in Section 3 for an interpretation used by the authors of this Strategy.

Botanist:

A person who engages in botany.

Botany:

Botany, a branch of biology that deals with the study of plants – cultivated or wild - including their structure, properties, and biochemical processes. It includes plant classification, plant diseases, and plant interactions with the

environment. Traditionally, botany includes the study of fungi and algae.

Browse; Browsing:

A type of herbivory in which a herbivore feeds on leaves, soft shoots, or fruits of high-growing, generally woody plants (shrubs and trees).

Citizen Botany Program:

See MTNHP-MNPS Citizen Botany Program

Climate Change:

A change in the average weather condition that persists over multiple decades or longer. Climate change can encompass both increases and decreases in temperature, shifts in precipitation, changing risk of severe weather types, and other features of the climate system. The term encompasses other atmospheric changes, such as accelerated levels of carbon dioxide (CO₂) and ozone depletion.

Climate Change Vulnerability Index (CCVI):

An index developed by NatureServe that uses a scoring system to integrate the species' predicted exposure to climate change within a defined assessment area (Montana). The index examines four elements: exposure to local climate change; indirect exposure to climate change; species-specific sensitivity; and documented or modeled responses to climate change. See also Tables 4-1 and 4-2 and Box 4-3 in Section 4.

Climax (Species):

A plant species that in forest succession is more adapted to a stable and predictable environment. As long as the site remains undisturbed climax species are likely to persist. Also called a late-seral, late-succession, K-selected, or equilibrium-species.

Collaborative Network (CN):

A partnership of autonomous people and organizations, supported by a computer network, that cooperate to share resources, such as data and connectivity. Herbaria that are part of a CN share data, such as specimen images, locations,

and label information, with other herbaria and research institutions.

Collections Manager (Herbarium):

A person who manages the herbarium. The person responsible for the long-term care of the herbarium and physical facilities for storage, including policy, access, specimen loans, digitizing, databasing, budgets, pest management, staff, and more. An herbarium may combine or separate the job of curator and collections manager. Compare with curator.

Conservation:

The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations, while maintaining its potential to meet the needs and aspirations of future generations. Conservation is positive and embraces preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment.

Consortium:

An agreement, combination, or group (as of herbaria) formed to undertake an enterprise beyond the resources of any one member. A Consortium of Herbaria can be regional, national, or international. It uses a collaborative network to unite specimen data from individual herbaria into a single database that is accessible by the public through an online portal.

Corolla:

The collective petals of the flower. The corolla encircles the reproductive organ(s) of a flower.

Cultural Burning:

A cultural fire practice used by Indigenous peoples to improve the vitality, resilience, or health of grasslands, forests, and other habitats.

Curator (Herbarium):

A person who conducts collection-based research and direct management of the herbarium collections. A curator preserves the botanical specimen, performs plant identification, collects or collaborates with others to obtain specimens,

manages the collections, and much more. An herbarium may combine or separate the job of curator and collections manager. Compare with collections manager.

Demography, Demographic (Plant):

Plant demography is the science of studying a plant species' population and how population characteristics change through time. Observed, mapped, or measured population characteristics include, but are not limited to: total plant count; number and size of flowers and fruits; number of vegetative individuals; location of individuals; and number of seedlings.

Ecological Resilience:

The capacity of a species, habitat, plant community, or ecosystem to respond to a perturbation or disturbance by resisting the damage and subsequently recovering. Disturbances of sufficient magnitude or duration can profoundly affect the natural system, forcing it to reach a threshold beyond which a different regime of process or structure predominates.

Ecological System:

A biological community or major grouping that re-occurs across the landscape in similar physical environments and is influenced by similar (yet dynamic) ecological processes, such as fire or flooding. Ecological Systems are mappable and tend to be intuitive to non-ecologists.

Ecotype:

A genetically distinct population of a species that is adapted to local or regional environmental conditions. The distinct population may exhibit morphology or physiology that differs from other populations of the same species across its range. Individuals of an ecotype can reproduce with other ecotypes of the same species and produce fertile offspring.

Endangered:

A term used in the Endangered Species Act and defined as "any species which is in danger of extinction throughout all or a significant portion of its range."

Ethnobotany:

The study of interrelations between humans and plants. The study of how people of a particular culture or region make use of indigenous (native) plants for foods, medicines, clothing, religious rituals, or other uses.

Exotic Species:

As used in this Strategy are species, varieties, subspecies, or hybrids that have deliberately or accidentally been introduced, usually through human activities, to areas (Montana) that are outside their native geographic range. Mechanisms to control their populations are lacking. Exotic species may or may not become established where introduced. As defined by others, exotic species are not yet reproducing in their new range. Also called non-native or invasive. Compare with non-native.

Extinct; Extinction:

A species that has no known living individuals in captivity or the wild. The Strategy uses this term in reference to national or global extinction.

Extirpate; Extirpated; Extirpation:

A species that has no known individuals with a local or regionally defined area. The Strategy uses this term in reference to state (Montana) extirpation.

Floral Resource:

Pertaining to the things that flowers and flowering plants provide to animals. Some floral resource examples include nectar, pollen, physical flower, source for shelter, and source for dew (water). This term is also associated with the seasonal and spatial availability of flowering.

Foundation Species:

In ecology, a species that has a strong role in structuring a community. In comparison to a keystone species, foundation species physically modify the environment, produce and maintain habitats that benefit other organisms. Compare with keystone species.

Genetics:

The study of individual genes and their roles in inheritance.

Genetic (DNA) Sequencing:

The general laboratory technique for determining the exact order of nucleotides, or bases, in a DNA molecule. The sequence tells scientists the kind of genetic information that is carried in a particular DNA segment.

Genomics:

An interdisciplinary field of molecular biology that focuses on the structure, function, evolution, mapping, and editing of genomes. Genomics aims at the collective characterization and quantification of all of an organism's genes, their interrelations, and their influence on the organism.

Genome:

An organism's complete set of DNA including all of its genes as well as its hierarchical, three-dimensional structure configuration.

Global Rank (G-Rank):

A rank that indicates the overall risk to global extinction by collectively evaluating the plant's rarity, population trends, and level of threats.

Graze; Grazing:

A type of herbivory in which a herbivore feeds on grasses and other low growing plants (forbs, sedges, etc.)

Greatest Conservation Need (GCN):

A term used in State Wildlife Action Plans that can be applied to animals, plants, and plant communities; see definition.

Habitat:

The natural home or environment where a plant, animal, or other organism lives. A habitat provides the plant, animal, or other organism with food, water, shelter, and space to survive.

Habitat Enhancement:

The process to increase the suitability of a site for a desired species, according to what defines that species' habitat.

Habitat Type:

A classification system based on the natural relationships of species with abiotic and biotic

environmental conditions for a particular area. A type represents all of the land areas potentially capable of supporting similar plant communities at potential climax of the vegetation.

Herbarium (plural, Herbaria):

A room or building in which a collection of dried plants is systematically arranged and kept for preservation.

Herbarium Portal:

A website that functions as an entry point to the internet that specifically links online users to one or more herbaria and their associated data.

Herbivory:

The eating of plants by animals. Relative to this Strategy, ungulates and insects are common herbivores.

Human Environment:

As defined by the Montana Environmental Policy Act, it is the physical, biological, social, cultural, and economic components, conditions, and factors which interactively determine the state, condition and quality of living conditions.

Important Plant Area (IPA):

A program developed by Plantlife to provide a framework for identifying and maintaining the richest sites for plant life. An IPA is a non-legal designation. In Montana, an IPA is designated by the Montana Native Plant Society, where it supports an exceptional population of one or more globally rare plants or assemblage of rare or threatened plants in the state.

Index Herbariorum (IH):

A worldwide directory of individual herbaria. A qualifying herbarium registers and demonstrates that it maintains a permanent collection of botanical specimens that are accessible to scientists. The Index maintains information on each herbarium, such as its physical location, number of collections, status of digitization, types of organisms stored, founding date, contact information and area expertise of staff, herbarium acronym, and website address.

Indicator Species:

A species or group of species whose function, population, or status can reveal the qualitative status of the environment in a given locale. An indicator species can be a species of plant, animal, or microorganism. For example, Black Greasewood can be an indicator of saline soils.

Indigenous Knowledge (IK):

Indigenous Knowledge is a body of observations, oral and written knowledge, innovations, practices, and beliefs that developed from Tribes and Indigenous Peoples through interaction and experience with the environment. Compare with Indigenous Traditional Ecological Knowledge, Traditional Ecological Knowledge, and Traditional Knowledge.

Indigenous Traditional Ecological Knowledge (ITEK):

Indigenous Traditional Ecological Knowledge (ITEK) is a form of Indigenous Knowledge and one of many important bodies of knowledge that contributes to the scientific, technical, social, and economic advancements of the US to our collective understanding of the natural world. It is a body of observations, oral and written knowledge, practices, and beliefs that promote environmental sustainability and the responsible stewardship of natural resources through relationships between human and environmental systems. It is applied to phenomena across biological, physical, cultural, and spiritual systems. IK, ITEK, TEK, and TK is owned by the Indigenous peoples. Compare with Indigenous Knowledge, Traditional Ecological Knowledge, and Traditional Knowledge.

Invasive Species:

An exotic (non-native) species whose introduction does or is likely to cause harm to human health, economics, or the new environment. The term applies to the species and any biological material that is capable of propagating it, such as egg, spore, seed, and root. The Montana Invasive Species Council (MISC) is responsible for identifying priority invasive species issues and making recommendations to

improve management of invasive species. Many exotic and non-native species can be relatively benign in their impacts to the environment, but invasive species are not. See also exotic, non-native, and noxious.

Isotope Analysis:

The identification of an isotopic signature and the abundance of certain stable isotopes of chemical elements within organic and inorganic compounds. Isotopic analysis can be used on herbaria specimens to reconstruct past environmental and climatic conditions.

Keystone Species:

A species that has a disproportionately large effect on its natural environment relative to its abundance. The species plays a critical role in maintaining the structure of an ecological community, affecting other plants and animals in the ecosystem, and helping to determine the types and numbers of various other species in the community. If the keystone species is removed, the entire ecosystem or the community may experience a dramatic shift. In comparison to a foundation species, keystone species strongly affect the composition of communities in an ecosystem. Compare with foundation species.

Metadata:

Data that provides information about other data, but not the content of the data itself. A herbarium specimen that is barcoded contains metadata (herbarium name, accession number, etc.) in addition to the specific information provided by the collector in the specimens' label.

Metamorphosis:

A profound change in form from one stage to the next in the life history of an organism. Example: the developmental changes of a caterpillar to the pupa and from the pupa to the butterfly.

Mitigation (environmental):

Legally mandated remediation for the loss of a protected species or ecosystem. Compare with restoration and remediation.

MNPS-MTNHP Citizen Botany Program:

A joint partnership between the Montana Natural Heritage Program (MTNHP) and Montana Native Plant Society (MNPS) to establish a Montana Citizen Botany Program designed to harness the energy and expertise of citizen botanists to obtain critical field-based botanical information. The concept of developing a Montana Citizen Botany Program has progressed with the completion of a pilot study conducted from 2022-2024.

Morphology:

A branch of biology that deals with the form and structure of animals, plants, and other organisms. Plant morphology studies the physical form and external structure of the plant. Examples: size, shape, and arrangement of leaves; type, shape and density of hairs; colors; textures; patterns of the veins.

Native Species:

A species (variety, subspecies, or hybrid) that naturally or historically occurred or currently occurs in a defined geographical area. Native vascular plants are those that were known to occur in Montana before European settlement, typically dated as prior to or at the time of the Lewis and Clark Expedition from 1803 to 1806.

Nomenclature (Plant):

A system of naming plants used in the science discipline. See also systematics and taxonomy.

Non-Native Species:

As used in this Strategy are species, varieties, subspecies, or hybrids that have deliberately or accidentally been introduced, usually through human activities, to areas (Montana) that are outside their native geographic range. Mechanisms to control their populations are lacking. Non-native species may or may not become established where introduced. Non-native is technically a better term than exotic in this Strategy. Also called exotic or invasive. Compare with non-native.

Non-Vascular Species:

A species of plant or fungus that lacks vascular

tissue (no xylem or phloem). Non-vascular plants include mosses, liverworts, and hornworts. Non-vascular fungi include lichens and true fungi. Compare with vascular.

Noxious Weed:

A plant designated by the Montana Department of Agriculture as ‘noxious’ because it causes harm to public health, agriculture, recreation, wildlife, or property in Montana. Noxious weeds are both an exotic and an invasive species; compare with exotic and invasive.

Occurrence:

See Species Occurrence.

Phenology:

The study of periodic events in biological life cycles and how these are influenced by seasonal and interannual variations in climate, as well as habitat factors (elevation, soil type, etc.). In plants, this can include flowering, leaf unfolding (budburst), seed-set, dispersal, and leaf fall in relation to climatic conditions.

Plant Blindness:

A proposed form of cognitive bias. When defined broadly it is the human tendency to ignore plant species in one’s own environment, to not recognize the importance of plant life to human affairs or on Earth, to think plants are inferior to animals, or the inability to appreciate the unique features and aesthetics of plants. When defined more specifically, it is the inability to distinguish the differences between plant species in one’s own environment.

Plant Community of Greatest Conservation Need:

A Plant Community of Greatest Conservation Need (GCN) is designated by the partnership that developed this Strategy and information is managed by the Montana Natural Heritage Program. A Plant Community of GCN in Montana exhibits the following elements: 1) fits the definition of a plant community, 2) is widespread and common in Montana, 3) is composed of smaller vegetation types, 4) provides ecosystem services, 5) is facing a

significant threat that can be identified, and 6) spans multiple land managers in different parts of Montana. The Montana State Wildlife Action Plan of 2015 uses a similar term, Community Type of Greatest Conservation Need (CTGCN).

Plant Species of Greatest Conservation Need:

A Plant Species of Greatest Conservation Need (GCN) is designated by the partnership that developed this Strategy and information is managed by the Montana Natural Heritage Program. A Plant Species of GCN is a vascular plant that is either a Montana Species of Concern (SOC) or a non-SOC that is ‘of management concern’. See also vascular plant Species of Concern, vascular Non-SOC plant of management concern, Priority 1 and 2, and Box 4-1, Section 4 of Strategy.

Plant Species of Greatest Inventory Need (PSGIN):

Vascular plant Species of Concern that are poorly documented, and for which information is needed and obtainable.

Pollination:

The transfer of pollen grains from the anther (male) to the stigma (female) of the pistil. Depending upon the plant species, pollination occurs within a single flower or between separate flowers.

Pollinator:

Any animal that moves pollen from the anther to the stigma portions of a flowering plant. Common pollinators include, but are not limited to bees, wasps, moths, butterflies, birds, flies, bats, ants, and small mammals.

Pollinator-Friendly Plants:

Native plant species that have high visitation rates by bees and attract the greatest number of bee species or support specialist bee species. These plant species may also bloom for extended periods across the landscape, thereby increasing floral resources for pollinators.

Pollinizer:

A plant that provides (is the source of) pollen.

Potential Species of Concern (PSOC):

Native species, varieties, or subspecies for which current, often limited, information suggests a potential for vulnerability to extirpation in Montana. The PSOC term is a State of Montana designation determined by the Montana Natural Heritage Program.

Preservation:

Preservation is the protection of the environment from the harmful effects of human activity. In general, it is the act or process of keeping the species, unique habitat, or plant community in existence.

Priority 1 and 2 (Vascular Plant Species of Greatest Conservation Need):

(Vascular) Plant Species of Greatest Conservation Need (GCN) are further classified in this Strategy as Priority 1 or Priority 2. A Priority 1 species has more rigorous observation and mapping data, some monitoring or research, and/or biological literature. A species-specific conservation profile can be more easily written for Priority 1 species. A Priority 2 species either has less published research and literature about them, beyond accurate observation data and moderately precise mapping or is of GCN in association with a Unique Habitat or Plant Community of GCN. A species-specific conservation profile may not be completed for Priority 2 plants.

Propagule:

Any cellular structure produced by an organism that is capable of dispersing and surviving in the environment before developing into a new individual. Examples are seeds, spores, and cysts. Plant cuttings are sometimes regarded as artificial propagules.

Rare Plants:

Rare plant species exhibit small population sizes, narrow geographic ranges, affinities to unique habitats, have low reproductive rates, and/or declining distributions or populations. They are often at risk of extirpation in Montana, or possibly worldwide.

Recovery Plan (Endangered Species Act):

A document developed by the USFWS for species that are federally listed as threatened or endangered under the Endangered Species Act. A species recovery plan describes the current status, threats and intended methods for increasing rare and endangered species population sizes. Recovery plans act as a foundation from which to build a conservation effort to preserve the plant or animal and prevent its extinction.

Rehabilitation:

Rehabilitation is making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the land to a pre-disturbance condition, but it does support returning it to a natural ecosystem state.

Remediation:

Remediation is improving an existing ecosystem or creating a new one with the aim of replacing another that has deteriorated or been destroyed.

Restoration:

The manipulation of the physical, chemical, and/or biological characteristics of a site with the goal of returning the majority of native organisms and natural functions to the lost or degraded native habitat.

Revegetation:

The establishment of vegetation on sites where it has been previously lost, often done with erosion control as the primary goal. Revegetation may or may establish plants that are native species to the area or that were present prior to their removal or loss.

Root Crown:

The upper portion of the root system from which a stem arises. A root crown area usually appears swollen, tapered, constricted (very thin), or as a combination of these. The root crown area is usually located near or at the soil level and is vaguely or clearly apparent.

Seral Community:

An intermediate stage found in the ecological succession of vegetation that advances towards its climax plant community.

Species Occurrence (SO):

A discrete area where the plant or animal is found or historically was documented based on direct observation(s). An SO is mapped as a polygon and may contain both the species and documented habitat. The Montana Natural Heritage Program defines and maps SOs for Species of Concern and Potential Species of Concern; it is similar to NatureServe's Element Occurrence (EO) except an SO is mapped at a finer scale.

Species Occurrence Rank (SO-Rank):

A rank that represents the overall "quality" of the Species Occurrence and is based on an assessment of the plant's population size, habitat quality, landscape context, and abiotic and biotic conditions. Updated and accurate SO ranks are used by managers in planning projects, prioritizing occurrences for restoration, identifying reference sites, and aiding in management decisions.

Species of Concern (SOC):

Native species, varieties, or subspecies that are at-risk due to declining population trends, threats to their habitats, a restricted distribution, and/or other factors. The SOC term is a State of Montana designation determined by the Montana Natural Heritage Program.

Species of Greatest Conservation Need:

A term used in State Wildlife Action Plans. See Plant Species of Greatest Conservation Need, vascular Plant Species of Concern, and vascular non-SOC plant of management concern.

Species of Greatest Inventory Need (SGIN):

A term used in State Wildlife Action Plans. See Plant Species of Greatest Inventory Need, Plant Species of Greatest Conservation Need, and vascular plant Species of Concern.

Specimen (Botanical):

An individual plant, fungus, or algae that is preserved for scientific long-term study. A vascular plant specimen is pressed, dried, and mounted with glue onto large, acid-free sheets of paper. Affixed to the sheet is a label of information that includes the plant's scientific name, collection location and habitat, collector's name and date, and other associated details. Non-vascular plants, fungi, and algae are typically preserved using other techniques.

State Threat Score:

The magnitude at which a species is observed, inferred, or suspected to be directly or indirectly negatively impacted by identified activities and/or processes (threats) at the statewide level. State Threat Score is assigned by the Montana Natural Heritage Program.

State Wildlife Action Plan:

A State Wildlife Action Plan is developed by a US state or territory for the purpose of conserving wildlife and habitat before it becomes too costly to restore and to prevent species from being listed under the Endangered Species Act. The plans are reviewed and approved by the US Fish and Wildlife Service and revised on a 10-year cycle. Montana's most recent SWAP was developed by Montana Fish, Wildlife & Parks in 2015; the next revision is in 2025. Approved plans are eligible to receive federal funds for species classified as Greatest Conservation Need (GCN). Some SWAPs have adopted plants as Species of GCN.

Stewardship:

The careful and responsible management of something entrusted to one's care.

Subnational Rank (S-Rank):

A rank that indicates the overall risk to state extirpation by collectively evaluating the plant's rarity, population trends, and level of threats. The S-Rank is commonly referred to as the species' State Rank. In Montana the Subnational Rank is determined by the Montana Natural Heritage Program.

Systematics (Plant):

Systematics is the study of relationships among organisms and the classification and naming of these organisms. Plant systematics addresses botanical species in the Plant, Fungal, and Algal Kingdoms. See also nomenclature and taxonomy.

Taxonomy (Plant):

Plant taxonomy is the science of classifying and naming plants. It is a branch of what is known as systematics, which is the science of determining how different biological organisms are related to each other. Taxonomy classifies plants and other organisms into different taxonomic levels. See also nomenclature and systematics.

Taxon (plural, Taxa):

A taxonomic group of any rank given formal recognition in a classification hierarchy, such as class, order, family, genus, species, variety.

Traditional Ecological Knowledge (TEK):

An accumulating body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (human and non-human) with one another and with the environment. It encompasses the world view of indigenous people which includes ecology, spirituality, human and animal relationships, and more. Compare with Indigenous Knowledge, Indigenous Traditional Ecological Knowledge, and Traditional Knowledge

Traditional Knowledge (TK):

Knowledge, know-how, skills, and practices that are developed, sustained, and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity. Compare with Indigenous Knowledge, Indigenous Traditional Ecological Knowledge, and Traditional Ecological Knowledge.

Threat:

The proximate activity or process that has caused, is causing, or may cause destruction, degradation, and/or impairment to the target plant. Threats may be related to human activities or may be natural.

Threatened (T); Federally-Threatened:

A term used in the Endangered Species Act, and defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.”

Tribal Sovereignty:

The inherent right of American Indians and Alaska Natives to govern themselves, and any decisions that could impact their property or citizens must be made with their participation and consent.

US National Vegetation Classification (USNVC):

The U.S National Vegetation Classification (USNVC) is a comprehensive classification system for all vegetation types in the United States. Much like a flora for plant species, the USNVC offers a hierarchy of classification levels from coarse to fine, providing a common language for the effective management and conservation of plant communities in the US. It is governed by standards for vegetation data collection and analysis, ensuring consistent reporting on the nation’s vegetation resources.

Ungulate:

Mammals that are four-footed and hoofed. In Montana, ungulates include wildlife (bighorn sheep, deer, elk, mountain goats, moose, and bison) and domesticated animals (sheep, swine, cows, cattle, and horses).

Unique Habitats of Greatest Conservation Need:

A Unique Habitat of Greatest Conservation Need (GCN) is designated by the partnership that developed this Strategy and information is managed by the Montana Natural Heritage Program. A Unique Habitat of GCN in Montana exhibits the following elements: 1) spatially limited in Montana, 2) formed under unusual conditions or combinations of geology, hydrology, soils, and/or other ecological factors, 3) are habitats for at least one plant Species of Concern or Potential Species of Concern which is partially or entirely restricted to those

conditions, and 4) may include at least one rare plant community (plant association, habitat type, or other).

Vascular Plant:

A plant that has specialized vascular tissues for the transport of water and minerals (xylem) and food (phloem). Vascular plants are trees, shrubs, forbs, grasses, ferns, club-mosses, and other beings. Compare with non-vascular.

Vascular Plant Species of Concern:

A vascular plant that meets the criteria for being designated as a Species of Concern by the Montana Natural Heritage Program. Vascular Plant Species of Concern that qualify as a (Vascular) Plant Species of Greatest Conservation Need (GCN) in this Strategy exhibit the following elements: 1) G1, G2, G3, or in combination, or S1, S2, S3, or in combination; and 2) faces a direct or indirect threat as determined by the Montana State Threat Score, or is associated with a Unique Habitat or Plant Community of GCN that faces a significant or highly probable threat, or is poorly documented/information needed [PSGIN]; and 3) lacks taxonomic problems or large location ambiguity. See also definitions for Plant Species of GCN and vascular non-SOC Plant. See also Box 4-1, Section 4 of Strategy.

Vascular Non-SOC Plant of Management Concern:

A vascular plant that is common or stable (not a Montana Species of Concern) in Montana as determined by the Montana Natural Heritage Program. A vascular non-SOC plant of management concern that qualifies as a (Vascular) Plant Species of Greatest Conservation

Need in this Strategy is nominated by several Strategy partners representing different organizations and is “of management concern” because the species is facing significant threats and a potential (not documented) decline.

Wetland:

A distinct ecosystem that is flooded or saturated by water, either permanently or seasonally. Wetlands often support vegetation typically adapted for life in saturated soil conditions (hydrophytic vegetation) and develop hydric soils. Wetlands support both aquatic and terrestrial plant and animal species.

Wetland Mitigation:

The restoration, creation, or enhancement of wetlands to compensate for permitted wetland losses.

Wildcraft:

To collect, harvest, or separate by cutting, prying, picking, peeling, breaking, pulling, digging, splitting, or otherwise removing uncultivated plants or plant parts from their physical connection or point of contact with the ground or vegetation upon which they are growing or from the place or position where they lay for commercial purposes. The term “commercial purposes” means the harvest of wildcrafted plant material for the purpose of selling, trading, or otherwise exchanging the material for profit.

Wildland-Urban Interface (WUI):

A term commonly used in areas that experience wildfires. The zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.



Photo E-2. Teaming together Montana's State Entomologist and members of the Montana Native Plant Society learn and share information on native plants, pollinators, and other insects that live in a grassland community. Priest Pass, Helena-Lewis and Clark National Forest, Montana.

