

APPENDIX 1: SCOPE OF WORK

THE UNIVERSITY OF MONTANA for operation of the Montana Natural Heritage Program

FY 2014 - FY 2015

The Scope of Work (SOW) for the “Core Services” in this contract (hereinafter referenced as “Core Contract”) is taken largely from the Montana Natural Heritage Program’s (NHP) Strategic Plan for 2010-2014 (Appendix 3), which received extensive review from MTNHP staff, MSL staff, and from state, federal, and private partners. In addition, the Wetlands and Land Cover MSDI services (Appendix 2) are based on the Montana Land Information Plan, December 2012.

The Appendices 1 & 2: Scope of Work (SOW) outlines essential core, supplemental core services of the NHP Botany, Zoology, Ecology, and Information Services program areas that are required to be completed under the Core Contract and the Wetlands and Land Cover MSDI statement of work.

Funding Source Definitions

- **Core:** This funding represents the \$878,226 included in the MSL-UM contract for “Essential Core Services.” Examples of essential core services include: fulfilling information requests across all program disciplines, adding new data to program databases, administering and managing all program databases and systems, maintaining species status, maintaining and improving web delivery of information, and program administration.
- **MSDI Core:** This funding is contained in the MSL-UM contract and is dedicated to the Wetlands and Land Cover MSDI data development and coordination. For FY14, that amount is \$80,106 and is contained in the contract between the University and the Library. FY15 funding is contingent upon the next MSDI work plan.
- **Supplemental Core:** Funding provided by partner agencies that contribute to the support of core services and information and may be allocated at the discretion of the Program for those essential core services. This funding is not specified or allocated in the MSL-UM contact. Examples include: data compilation, species or community status reviews, data system maintenance, development of web pages and applications, answering user requests, and providing trainings on the use of NHP resources.
- **Project:** Funding that supports the overall mission of the program but entails specific deliverable products for partners. Project funding does not allow discretionary spending by the Program and does not directly support essential core services. This funding is not specified or allocated in the MSL-UM contact. Examples include: requests for development of new datasets, web resources, or field surveys to address data needs such as assessments of the status of species or communities.

The basic FTE allocation of funding for the coming biennium is depicted in the table below. This allocation will, by necessity, fluctuate over the contract period to account for project field work, changing projects and priorities.

Position	Core	MSDI Core
Lead Program Manager	.70	
Grants & Finance Administrator	.50	
Senior Botanist	.30	
Senior Zoologist	.30	
Senior Ecologist	.30	.10
Biological Data Systems Coordinator	.70	
Web Projects Manager	.70	
Biologist/Information Specialist	.70	
Biologist/Information Specialist	.50	
Data Assistant	.80	
Finance/Office Assistant		
Ecologist/Project Manager		
Ecologist		
Aquatic Ecologist		
Zoologist		
Zoologist		
Finance/Office Assistant		
Wetlands Mapping Coordinator/GIS Specialist		.20
Ecologist/GIS Specialist		
GIS Specialist		
Ecologist/GIS Specialist		
Ecologist/GIS Specialist		
Ecologist/GIS Specialist		
Ecologist/GIS Specialist		
Spatial Analysis Lab--GIS Analyst/Ecologist		.60
Spatial Analysis Lab--GIS Analyst/Ecologist		.20
Spatial Analysis Lab--GIS Analyst/Ecologist		

As depicted above, the current Core funding (non-MSDI) supports approximately 5.5 FTE (of the 27 total permanent employees) and the basic operational costs required to provide the essential core services of NHP. The SOW includes additional services that NHP feels are important to provide in FY14 and FY15 pending the availability of funding from partner organizations to supplement the core functions and services of NHP.

Montana Natural Heritage Program Services FY14 - FY15

The tables below list Administrative, Information Services, Botany, Zoology, and Ecology services for FY14-15. The tables may list three categories of tasks:

- 1) **Core Services:** Tasks and services that will be delivered principally with the Core funding in this contract.
- 2) **Supplemental Core Services:** Tasks and services for which there is not sufficient Core funding but which will be delivered dependent on acquiring discretionary funding support from partner agencies.
- 3) **Project Supported Services:** Additional tasks and services that augment the essential core services that may be provided pending the availability of project funding. This category does not list all of the anticipated projects.

Core Administrative Services

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| 1. Coordinate all program activities with Partners and program areas |
| 2. Administer contracts and grants |
| 3. Promote use of Heritage data resources through outreach and training sessions |
| 4. Collaborate with Library staff to effectively represent the mandate, activities, and products of NHP through publications, reports, brochures, posters, maps, fact sheets, etc. |
| 5. Participate in regional and national network coordination meetings and conference calls to help ensure continued compatibility and to take advantage of opportunities and advocate for initiatives that would benefit Montana. |
| 6. Develop an updated revision of the FY10-14 NHP 5-year Strategic Plan for the period FY15-20 |

Core Information Services Program Services

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| 1. Respond to requests for MTNHP information used in Environmental Assessments |
| 2. Finish the migration from the Biotics4 database to a SQL database environment for the following components: species and community occurrences, references, and managed areas. |
| 3. Implement BIOTCIS 5 for the management of state and global element information. In addition, we will: <ol style="list-style-type: none"> a. Work with NatureServe to develop procedures and methods to upload element occurrence data into the BIOTICS 5 database b. Work with NatureServe to develop procedures and methods to upload state element data to and download global element data from the BIOTICS 5 database via web services. |
| 4. Administer data server internal to the firewall for editing and storage of MTNHP data including: <ol style="list-style-type: none"> a. Coordinate overall MTNHP server architecture and development with MSL b. Design and maintain appropriate relational databases for botany, zoology, and ecology data. c. Administer MTNHP databases on internal server including database security and routine backup to prevent catastrophic loss d. Develop procedures and methods to disseminate information to web-facing servers external to the firewall |
| 5. Continue to work with Digital Library staff to enhance discovery of biological information in the GIS Portal and the MSL geographic information web site. |

6. Finish the migration of agency-level features of Natural Heritage Tracker into the Natural Heritage MapViewer
7. Provide regular updates on the website, social media, and through emails as new resources become available (including reports, web tools, Montana Field Guide enhancements, etc.).
8. Maintain and improve the functionality and ease of use general Natural Heritage Program web pages
9. Revise the MTNHP web site to conform to the Montana web standard including mobile device compatibility
10. Continue to develop, maintain and improve easy-to-use methods for data contributors to submit animal, plant, and habitat information, including observations, plot data, and photographs
11. Maintain and improve the functionality and ease of use of the Montana Field Guide and Species of Concern web report applications
12. Work with the MSL Digital Library Division staff to effectively cross reference and integrate MTNHP information and data with the MSL catalogue, search methods, and reference services.
13. Maintain the Natural Heritage Program's reference system for literature on the plants, animals, and habitats of Montana
14. Participate in a work group with MSL GeoInfo to develop a new workflow for land information data creation, maintenance, and dissemination that includes the land management, conservation easements, public lands and private conservation lands data which are co-maintained by MSL GeoInfo and MTNHP.

Supplemental Core Information Services Program Services

1. Create and maintain map services for MTNHP data that Partners can consume in their GIS or web applications, including land management, species occurrences, and animal and plant point observation data
2. Provide support to train and inform agency Partners in effectively using technical resources, services, and applications, through webinars, PowerPoint presentations at professional meetings, or agency groups
3. Gather information from users about their information needs, format/access preferences, and the effectiveness of our delivery systems and tools
4. Examine the feasibility of developing techniques and tools for mobile data collection for staff and citizen scientist's

Project Supported Information Services Program Services

1. With funding support from partner agencies, develop capability within the MapViewer to display and query species observation data from the surrounding states that lie within the administrative boundary of the BLM Montana-Dakota Office and Region 1 of the US Forest
2. Design, develop, and deploy a "Mid-level" functional access to MTNHP Species of Concern (SOC), habitat, and species list information in the Natural Heritage MapViewer to support planning and resource management activities of local government, private consultants, and conservation organizations

Core Botany Program Services

1. Maintain a comprehensive database and taxonomic list of vascular plants occurring in Montana.
2. Collect and manage observation data for vascular plants.
3. Create species' occurrences for vascular plant, bryophyte and lichen Species of Concern.
4. Review the status of vascular plants, assign state ranks and, where appropriate, assign global ranks, and document these status ranks
5. Respond to requests for information on the identification, biology, ecology, conservation status, management, and appropriate survey methods for vascular plants, bryophytes and lichens.
6. Work with other Heritage staff to regularly exchange information with NatureServe.
7. Work with other Heritage staff to maintain and improve content and delivery of botanical information on NHP websites, including Field Guide, SOC Report and MapViewer.
8. Present information on NHP botanical services and data products, and Montana's plant resources at professional and public meetings.
9. Create and maintain information on vascular plants related to their taxonomy, biology, ecology, status, identification and management.
10. Compile photographic images of vascular plants, bryophytes and lichens.
11. Compile literature on vascular plants, bryophytes and lichens.

Supplemental Core Botany Program Services

1. Create associations between vascular plant Species of Concern and Ecological Systems/habitats in which they occur.
2. Compile and maintain a database of bryophyte and lichen taxa occurring in Montana.
3. Review the status of bryophytes and lichens, assign state ranks and, where appropriate, assign global ranks, and document these status ranks
4. Collect and manage observation data for bryophytes and lichens.
5. Create and maintain information on bryophytes and lichens related to their taxonomy, biology, ecology, status, identification and management.
6. Maintain a list of related web resources relevant to vascular plants, bryophytes and lichens.
7. Develop and maintain a geodatabase of unique habitats such as fens that are of special importance for Montana's botanical resources.

Project Supported Botany Program Services

1. Conduct training sessions on the identification and ecology of Montana's vascular plants.
2. Monitor populations of ESA-listed and globally rare vascular plants.
3. Conduct field surveys for vascular plants, bryophytes and lichens, focusing on Species of Concern and under-surveyed geographic areas.
4. Develop reports and peer-reviewed publications on the distribution, taxonomy, biology, ecology, status, identification and management of Montana's vascular plants, bryophytes and lichens.
5. Create predicted distribution maps for vascular plant, bryophyte and lichen Species of Concern.
6. Compile and maintain data on other taxonomic groups: Fungi, Algae, Diatoms.

Core Ecology Program Services

1. Respond to user requests for information on the distribution, composition, successional dynamics, conservation status, management, and appropriate survey methods for terrestrial and wetland communities
2. Respond to user requests for assistance using or interpreting wetland and land cover map products
3. Compile photographic images of wetland and terrestrial habitats representative of those found in Montana
4. Create and maintain accounts for terrestrial and wetland land cover classes and/or ecological systems in the Montana Field Guide that describe the composition, distribution, status, successional dynamics, and management/restoration needs of each.
5. Work with Information Services staff to maintain and improve content of ecological information on Heritage websites, including wetland mapping and assessments, land cover mapping, and ecological community accounts.
6. Collaborate with other Heritage Program and NatureServe ecologists from the Rocky Mountain Region to ensure compatibility of ecological mapping and classification systems
7. Update the 2002 list of ecological communities in Montana
8. Maintain a list of related web resources relevant to terrestrial and wetland communities

Supplemental Core Ecology Program Services

1. Assess the status of terrestrial and wetland communities and ecosystems, assign state ranks, and document the justification behind status ranks
2. Identify ecological sites of particular conservation concern that should be included in MTNHP information provided for environmental assessments
3. Compile literature on terrestrial, and wetland communities with emphasis on those of conservation concern
4. Maintain crosswalks between different vegetation classification schemes to facilitate use of MTNHP products and products created by others
5. Collaborate with partner agencies to develop ecological site descriptions
6. Develop and refine GIS-based approaches to landscape-level condition assessment
7. Work with Information Services to make structured surveys of aquatic communities available through Map Viewer
8. Work with Information Services to make wetland assessments available through Map Viewer
9. Work with Information Services to make a statewide aquatic classification map available through Map Viewer and Ecological Systems Field Guide

10. Compile vegetation data collected by others to support current and future vegetation classification and mapping efforts
11. Present results of surveys or status assessments of terrestrial and wetland communities at professional and public meetings
Project Supported Ecology Program Services
1. Conduct field surveys for underrepresented or uncommon ecological communities in under-surveyed geographic areas
2. Develop reports and peer-reviewed publications on the composition, distribution, and status of Montana's wetland and terrestrial communities.
3. Evaluate the status of wetland and terrestrial communities with field surveys
4. Maintain information on aquatic communities and their status through field surveys, publications and mapping products.

Core Zoology Program Services
1. Respond to requests for information on the identification, biology, ecology, conservation status, management, and appropriate survey methods for vertebrate and invertebrate species
2. Continue to manage an animal point observation database (POD) for all animal species.
3. Work with Information Services staff to maintain and improve content of zoological information on Heritage websites
4. Collect and manage observational data on animal SOC that has been gathered by others
5. Maintain animal species occurrences for existing SOC species from high value observations of animal SOC that can be used in Environmental Reviews
6. Maintain a complete taxonomic list of vertebrate animal species for Montana
7. Maintain a list of related web resources relevant to vertebrates and invertebrates
8. Work with other Heritage staff to regularly exchange information with NatureServe

Supplemental Core Zoology Program Services
1. Review the status of vertebrate and invertebrate animal taxa, assign state ranks, assist NatureServe with assigning global ranks when appropriate, and document these status ranks
2. Create animal species occurrences for newly designated SOC species from high value observations of animal SOC that can be used in Environmental Reviews
3. Maintain species accounts, including state and Western Hemisphere range maps and observational maps, in the Montana Field Guide for all animal SOC
4. Create predicted distribution maps for animal SOC
5. Work toward a complete taxonomic list of invertebrate animal species for Montana
6. Create and maintain species accounts, including state and Western Hemisphere range maps and observational maps, in the Montana Field Guide for animal species that are not SOC
7. Create predicted distribution maps for animal species that are not SOC
8. Create associations between animal SOC and the Ecological Systems in which they are known to occur
9. Create associations between animal species that are not Species of Concern and the Ecological Systems in which they are known to occur
10. Compile literature on vertebrate and invertebrate animal species with an emphasis on SOC
11. Compile photographic images of vertebrate and invertebrate animal species and locations where animal surveys have been conducted for Montana SOC as they become available
12. Compile photographic images of vertebrate and invertebrate animal species and locations where animal surveys have been conducted for Montana non-SOC

Project Supported Zoology Program Services
1. Conduct field surveys for vertebrate and invertebrate species with a focus on SOC and under-surveyed geographic areas and habitats
2. Develop reports, posters, books, web pages and peer-reviewed publications on the distribution, status, biology of, and human impacts on Montana's animal species
3. Present results of surveys or status assessments of animals at professional and public meetings

**APPENDIX 2: SCOPE OF WORK
For FY14
Wetlands and Land Cover MSDI Framework Services**

Core Wetlands and Land Cover Services
1. Provide coordination and stewardship of the Wetlands MSDI GIS database using MLIAC funding and other project funding
2. Participate in a work group with NRIS to develop a new workflow for hydrologic data creation, maintenance, and dissemination that includes the wetlands/riparian database
3. Provide coordination and stewardship of the MSDI Land Cover GIS database using MLIAC funding and other project funding
4. Working with NRIS, provide data and assist with maintaining map services and metadata for Wetlands and Land Cover data sets as part of the MSDI map services, and GIS Portal downloads
5. With funding from MLIAC and other sources, maintain and update the 2013 statewide Land Cover data set based on the annual workplan included in the overall Land Information Plan submitted to MLIAC
6. Develop predicted distribution maps for communities of particular concern that are not easily mappable (e.g., whitebark pine, silver sagebrush)
7. Revise, add and delete map classification units as necessary to improve map usability
Project Supported Wetlands and Land Cover Services
1. With outside project funding, develop a statewide data layer of wetland and riparian mapping information from NAIP imagery. Interpret and map wetlands and riparian areas for approximately 250 USGS Quads
2. With outside project funding, conduct field surveys to improve land cover classification accuracy
3. With outside project funding, conduct field surveys to improve wetland mapping accuracy
4. With outside project funding, add attributes to wetland mapping to improve usability and transferability