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DEPARTMENT OF NATURAL RESOURCES
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FINAL
ENVIRONMENTAL ASSESSMENT

Project Name:	City of Harlowton Asbestos Removal, Cleanup and Restoration of Contaminated Soils at the Harlowton Roundhouse in Harlowton, MT
Proposed Implementation Date:	Projected date 2023-2024
Proponent:	City of Harlowton
Location:	46.42928, -109.82663
County:	Wheatland

I. TYPE AND PURPOSE OF ACTION

The City of Harlowton (City) is proposing to conduct a fifth phase of contaminated soils treatment at the Comprehensive Environmental Cleanup and Responsibility Act (CECRA) Harlowton Roundhouse Facility (Facility) in Harlowton, Montana. The injection of chemical oxidant beneath the historic rail towers, as well as the removal of asbestos debris contaminated soils, will both restore and protect Montana's natural resources. This project will restore severely contaminated soils, the regional aquifer, and the adjacent wetland all located within the Musselshell River Flood Plain. By coordinating this Department of Natural Resources and Conservation (DNRC) Resource and Development Grant (RDG) funds with the subsequent use of the City's 2018 DNRC Renewable Resource Grants and Loans Program (RRGL) grant, the removal of contaminated soils will also facilitate the transformation of the contaminated railyard into a regional nature trail and wetland wildlife viewing park, which will be safe, functional, and attractive to humans and wildlife. When completed, this wetland system will not only convert the liability of a brownfields site into an amenity for the City but will also protect the City and downstream communities from damaging floods.

Petroleum hydrocarbon contamination at the railyard is impacting the regional groundwater aquifer and surface and subsurface soils at concentrations about DEQ Risk Based Screening Levels (RBSLs) (e.g. 3,240 mg/kg C9-C18 Aliphatics and 1,160mg/kg C11-C22 Aromatics). Up to 2 feet of spilled diesel remains floating on top of the site's groundwater. This diesel product contains multiple carcinogenic and non-carcinogenic compounds with concentrations up to 400 times their respective RBSLs (e.g. 1,090 mg/kg-dry for Naphthalene and 333,000 mg/kg-dry for C19-C36 Aliphatics). The historic railyard's proximity to the adjacent wetland and tributary of the Musselshell River means that this contamination is impacting both wetlands and surface water. Surface water in the east excavation pond still exceeds DEQ's Screen for Total Extractable Hydrocarbons at 1530 µg/L. This can be explained by soils along the bank of the east excavation still having concentrations exceeding both direct contact and leaching to groundwater RBSLs. There is also contamination underlaying the two historic railyard towers. These towers are contributing features in the Milwaukee Road Historic District's listing on the National Register of Historic Places.

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Objectives of the project are:

- Address impacts to the natural resources (soils and the regional aquifer) at the site through the *in-situ* treatment of petroleum contamination beneath the historic rail towers and the excavation of asbestos debris from within the former railyard dump. This objective can be completed by December 2025.
- Prepare the site so that the historic wetland can be restored using a 2018 RRGL Project Grant. This will include the removal of physical hazards (e.g. buried underground storage tanks and dry wells/culverts) and preparing the site for revegetation. This objective can be completed by December 2025.
- Documentation of all interim actions of Phase V and the completion and approval of both a MT Department of Environmental Quality (DEQ) Environmental Assessment Voluntary Cleanup Plan (EA VCP) and Remediation Proposal Voluntary Cleanup Plan (RP VCP). This objective can be completed by July 2026.

Problem History

The Chicago, Milwaukee, St. Paul, and Pacific Railroad Company's (Milwaukee Road) Harlowton Milwaukee Roundhouse Facility (approximately 180 acres) operated as a railroad engine repair and fueling facility from 1900 to 1979. The Milwaukee Road went bankrupt in 1980 and reorganized as CMC Heartland Partners. CMC Heartland Partners transferred ownership of the site to the City of Harlowton in 1985, and the city has remained the owner since. DEQ funded two preliminary site investigations in 1995 and 1997 that uncovered diesel and other petroleum compounds (i.e. free product) floating on the water table in the former settling pond area, the roundhouse, and at various points between the two (Pioneer Technical Services, Inc. – Site Inspection Report for the Harlowton Roundhouse, December 1995; Pioneer Technical Services, Inc. – Expanded Site Inspection Report for the Harlowton Milwaukee Roundhouse, January 1997).

Through a series of meetings occurring from 2014-2016 between DEQ staff, Pioneer personnel, and former Milwaukee Railroad employees, it became clear that the predominant problems at the facility were likely diesel fuel spills, leakage from underground diesel piping, and engine refueling accidents. A 500,000-gallon, aboveground storage tank (AST) was used at the roundhouse to supply fuel for the diesel-powered locomotives. Diesel was typically brought to the facility in railcars and pumped into the tank via underground piping. The former employees reported that this 6-inch diameter underground diesel line, leading from the pump house to the 500,000-gallon AST, was found to be faulty and leaked diesel fuel into the subsurface each time a tanker car was offloaded through the pump house into the AST. Former employees also explained that refueling diesel locomotives sometimes would result in overfills when the refueling crew was distracted or because automatic shutoff dispensers periodically malfunctioned. Former employees also stated that a free product recovery system was installed in the late 1970s in the former settling pond area and operated under MPDES permit MT-0000400 (Pioneer Technical Services, Inc., Letter Report – Laser Induced Fluorescence (LIF) Investigation, Former Harlowton Milwaukee Roundhouse, December 2015).

Between April of 2015 and February 2018, DEQ conducted a series of investigations that helped determine the nature and extent of petroleum and metals contamination at the Facility (Pioneer Technical Services, Inc., Letter Report - Laser Induced Fluorescence (LIF) Investigation, Former Harlowton Milwaukee Roundhouse, December 2015; Pioneer Technical Services, Inc., Corrective Action Report for the Removal and Landfarming of Petroleum Hydrocarbon Contaminated Soil and Overburden Characterization at the Former Milwaukee Roundhouse Site, Harlowton, Montana July 2017). Contaminants of concern for the facility include mercury, lead, and petroleum

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contamination. While the metals contamination found within the top four feet of the soil column exceeds residential screening levels, it does not exceed direct contact recreational risk screening levels. Conversely, petroleum contamination exceeding DEQ's RBSLs was typically found beneath the 4-foot soil interval. Several predominant pockets of subsurface petroleum contamination and groundwater contamination were discovered though the course of these previous investigations.

In 2016, DEQ obligated Orphan Share Account funds for the first phase of cleanup that created a local, 15-acre, major, one-time permitted landfarm, and excavated two separate source areas within the Facility. Due to its proximity to the tributary, the first area excavated was the former settling pond. During Phase 1 excavation, two previously unknown 15,000-gallon buried rail cars were discovered that had previously been used as oil-water separators for the historic free product recovery system. The 2016 Phase 1 excavation also discovered a corroded 5000-gallon underground storage tank while removing petroleum soils in the western area. Approximately 8,000 cubic yards of contaminated soils were removed and treated at the landfarm during Phase 1 excavation.

In 2019, the City utilized approximately $180,000 from its 2018 DNRC Project Grant to excavate and dispose of approximately 5,600 cubic yards of contaminated soils from the northernmost portion of the site (Phase 2). Prior to excavation, a surface and subsurface asbestos inspection was performed confirming the area was clear of asbestos debris. This activity also removed 2 additional underground storage tanks (UST) that were found in the northern portion of the railyard. Also in 2019, an asbestos inspection performed on the Historic Roundhouse discovered areas where asbestos debris had been improperly abandoned at the site. Using a DNRC Planning Grant, a complete asbestos inspection was performed across the historic railyard. This 2019 inspection identified four (4) small, localized trash pits, with historic asbestos-containing building materials, and approximately 3,000 cubic yards of overburden littered with asbestos debris. This overburden was brought in by the railroad to help level the railyard and construct a berm around the 500,000-gallon AST. The asbestos debris ranges from woven gaskets and wire insulation to asbestos fiber board. These were likely unwanted refuse and disposed of at the site according to practices of that era. In 2021, the City used the remaining funds from the 2018 DNRC Project grant and a $218,000 DEQ Orphan Share Account Grant to excavate and dispose of the asbestos contaminated soils and trash pits in the Great Falls Landfill (Phase 3 of excavation).

In 2021, the City used a DNRC Planning grant to investigate the nature and extent of contamination found within the historic railyard dump. While no petroleum, metals, or chlorinated solvents were detected above DEQ generic screening levels; asbestos debris was encountered throughout the historic dump. The City is proposing to use this 2022 DNRC RDG Project Grant to excavate and dispose of asbestos debris found within the railyard dump at the Great Falls landfill. This disposal alternative would provide a safe and permanent solution to this public health and environmental risk.

In 2022, the City used its 2016 DRNC RDG Project grant to excavate and dispose of approximately 2,400 cubic yards of soils contaminated with both petroleum and metals (mixed waste soils) found exceeding residential screening levels. The metals concentrations found in this pocket of mixed waste soils exceeded residential but not recreational screening levels. This residential exceedance prevented the treatment and disposal of this contamination in the major, one-time landfarm of 2016. Therefore, the City applied for and was permitted a minor, one-time landfarm on the railyard property to treat the petroleum contamination found in this mixed waste soils. Once the petroleum contamination has been treated, the city will be able to use this soil as on-site backfill. The removal of the asbestos and mixed waste soils will allow the City to excavate a significant portion of the

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remaining contamination using their 2020 DNRC RDG Project grant in the Fall of 2022 and Spring of 2023 (Phase 4).

The City is proposing a fifth cleanup phase to use the 2022 DNRC RDG Project Grant on the following activities:

- Excavate and properly dispose of asbestos-contaminated railyard dump.
- Address any remaining petroleum contaminated soils, post-Phase 4 excavation, including contamination underlying the historic railyard towers. Following the final remedial action, eight (8) groundwater monitoring wells will be installed to monitor the effects of the source zone removal.
- Prepare the site so that the City can subsequently use their 2018 RRGL Project Grant to restore the historic wetland into a regional nature trail and wetland wildlife viewing park.
- Document all phases of the remediation/reclamation activities in a DEQ approved EA VCP and RP VCP.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project. List number of individuals contacted, number of responses received, and newspapers in which notices were placed and for how long. Briefly summarize issues received from the public.

The City has ongoing communication and coordination with Environmental Protection Agency (EPA) because Harlowton Roundhouse is an EPA designated Brownsfield site, as well as with DEQ because of the Comprehensive Environmental Cleanup and Responsibility Act designation, commonly known as a state superfund site.

Previous Investigations and Remedial Actions at this Facility include:

- Program Site Investigation: Performed for the Montana Department of Health and Environmental Services (became DEQ) and EPA CERCLA in June 1993
- Program Preliminary Assessment: Performed for the Montana Department of Health and Environmental Services (became DEQ) and EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in March 1994
- DNRC RDG Planning Grant funded Laser Induced Fluorescence (LIF) Investigation: Performed in collaboration with the DEQ, December 2015
- DEQ Orphan Share Account Funded Soils Characterization, Excavation, and Delineation Interim Action, October 2016 – April 2017
- DNRC RDG Planning Grant funded additional source area investigation: Performed in collaboration with the DEQ, March 2018
- DNRC RRGL Planning Grant funded wetland vision and design: Performed in collaboration with the DEQ, April 2018
- DNRC RRGL Planning Grant funded the proposal to the DNRC Regional office to consider this project as restoration of a historic wetland and therefore any surface water created from open excavations would be exempt from requiring a water right if it exceeded 10 acre-feet. Based upon this determination the wetland visioning and design have been modified in

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collaboration with the City, DEQ, and a local wetland citizens group, June 2019 – May 2020

- DNRC RDG Planning Grant funded an Asbestos Inspection of debris in Overburden Soils: Performed in collaboration with DEQ, August 2019 – December 2019
- DNRC RDG Project Grant funded the excavation and landfarming of 5,600 cubic yards of petroleum contaminated soils and the removal of 2 USTs: Performed in collaboration with DEQ, October – December 2019
- DNRC RDG Planning Grant funded the investigation of remaining potential sources of contamination (i.e. the Railyard Dump, the Transformer rack for PCBs, and the Slough/Wetlands): Performed in collaboration with DEQ, October 2021
- DNRC RDG Project Grant and DEQ Orphan Share Account funded excavation and disposal of the approximate 3000 cubic yards of asbestos debris contaminated soils: Performed in collaboration with DEQ, September – November 2021
- DEQ 2021 Special Legislative Funded excavation and removal of a 15,000 gallon tanker-railcar: Performed in February 2022
- DNRC RDG Project Grant funded excavation and disposal in new on-site one-time landfarm of 2,400 cubic yards of metals and petroleum (mixed waste) contaminated soils: Performed in March 2022.

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2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:
Examples: cost-share agreement with U.S. Forest Service, 124 Permit, 3A Authorization, Air Quality Major Open Burning Permit.

U.S. Army Corps of Engineers – Clean Water Act Section 404 Permit
MT Department of Environmental Quality – Clean Water Act Section 401 Certification
Upper Musselshell Conservation District/DEQ – 318 Turbidity Waiver
City of Harlowton – City Floodplain Development Permit
DEQ – Storm Water – Construction
Montana Fish, Wildlife and Parks – Montana Stream Protection Act (SPA-124)
Environmental Protection Agency – EPA Underground Injection Permit

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3. ALTERNATIVE DEVELOPMENT:
Describe alternatives considered and, if applicable, provide brief description of how the alternatives were developed. List alternatives that were considered but eliminated from further analysis and why. Include the No Action alternative.

Alternative 1 – No Action:
Based upon information from multiple DNRC Planning grants, it is estimated that approximately 11,500 cubic yards of petroleum contaminated soils currently exceed MT DEQ risk-based screening levels (RBSLs) at the Facility after the asbestos containing overburden is removed. The 2020 DNRC Project grant will excavate and properly treat a significant amount of this petroleum contaminated soil. However, it is highly likely that not all the subsurface petroleum contamination will be addressed and there will be several areas, including underneath the two historic railyard towers, that will need to be addressed using the 2022 DNRC RDG Project grant funding. In addition, the presence of asbestos debris throughout the former railyard dump location poses an immediate risk to human health and the environment. Given the location of the railyard dump adjacent to the floodway, if not properly managed and addressed, the asbestos contamination has the potential to be continuously exposed, disturbed, and dispersed throughout the Musselshell River floodplain.

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This asbestos also poses health risks to aquatic organisms, fish, and terrestrial wildlife. By choosing no action, contamination at the railyard will likely continue to impact and have detrimental effects on both the regional shallow aquifer, the Musselshell River, and the local ecosystem for centuries.

Alternative 2 – Removal of the Historic Rail Towers and Excavation of Any Remaining Petroleum and Asbestos Contamination:
Cost estimates for the abatement and removal of the historic sand and waste oil rail towers is estimated at $60,000. This alternative would permanently remove two historically contributing components to the Milwaukee Road Historic District and facilitate the excavation of the remaining contamination beneath the historic towers. The excavation and treatment of approximately 400 cubic yards of remaining petroleum contamination beneath the rail towers is estimated at $20,000. Estimated excavation and disposal costs of the former dump is approximately $240,000.

Alternative 3 – Limited In-situ Chemical Oxidation of Remaining Petroleum Contamination and Excavation of Asbestos Contamination. (Preferred Alternative):
This alternative includes two rounds of chemical oxidation underneath historic rail structures. The cost of two rounds of chemical oxidant injection is comparable to that of demolition of the rail towers and excavation. The cost of two rounds of oxidant injection to treat 400 cubic yards (approximately $110/yard) is estimated at $88,000. This alternative has the added benefit of keeping the historical legacy and integrity of the railyard and the community intact. Estimated excavation and disposal costs of the former dump is approximately $240,000.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

According to the NRCS Web Soil Survey the soils on-site are comprised of the Fairway-Meadowcreek-Soapcreek complex. This complex, which is rarely flooded and with 0-2% slopes, ranges from a loam at the surface shifting to a silt loam from 8-45 inches below ground surface, and then a very gravelly sand at a depth between 45-60 inches below ground surface. Based upon the previous investigations, this gravelly sand typically continues to a depth between 10-15 feet below ground surface where a weathered shale is encountered. The Musselshell River flows through a one-half to one-mile-wide alluvial valley. The underlying bedrock in the vicinity of Harlowton is primarily shales and sandstones of the late Cretaceous Montana Group.

Investigations revealed that during construction and operation of the facility, the railroad placed 4-5 feet of fill in certain areas, presumably to establish grade and elevation above the adjacent Musselshell floodplain. At least some of this fill was placed in areas that were likely wetlands, as evidenced by the Bureau of Land Management's (BLM) General Land Office Record (GLO) map indicating the former alignment of the Musselshell River around 1874. Following the 2011

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Musselshell River floods, the City of Harlowton placed an additional 4 to 5 feet of material within the site. Based on the likelihood of wetlands existing within the site prior to railroad operations, it is believed that not only will the wetland restoration project be feasible, but that it will also assist the City and downstream communities by retaining and slowing Musselshell River floodwaters.

The Montana Bureau of Mines and Geology (MBMG) reported in 1962 that the Wheatland basin is a downward trending geologic structure extending roughly east-west through Wheatland County. It is bounded on the north by the Big Snowy and Little Belt uplift, and to the south by the Big Elk and Little Elk domes and the Shawmut anticline. The Castle Mountains intrusion and uplift more or less form the western boundary.

Anthropogenic contamination is present in surface and subsurface soils.

Proposed Alternative – Potentially direct and indirect, minor, short- to long-term, localized adverse impacts to soil quality, stability, and moisture from construction activities. Large construction equipment can be expected to compact soils and damage soil profiles during excavation. Adverse impacts are temporary and limited to construction activities. The proposed project will have significant, direct and indirect, long-term beneficial impacts to soil quality, as it will permanently remove contaminated soil at the site. The shallow depth of contamination and types of soils at this site allow for the contamination to be easily excavated and removed from the site. All remediation work will follow appropriate remediation techniques and ensure safe removal and minimal disturbances to surrounding topography.

No Action Alternative – Potentially direct and indirect, minor to major, short- to long-term, recurring adverse impacts to soil quality, stability, and moisture. The soil will continue to be contaminated and be a source of human and ecological exposures.

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5. WATER QUALITY, QUANTITY AND DISTRIBUTION:
Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

Groundwater generally moves downward below the Wheatland basin to form an artesian condition of considerable potential. Some of the aquifers may have a strong artesian head resulting from intake areas much higher in elevation than at the point of withdrawal. Groundwater flow direction is generally toward the Musselshell River and towards the downstream direction (Pioneer Technical Services, Inc., Site Inspection Report for the Harlowton Roundhouse, December 1995).

Groundwater elevations were measured in April of 2015 and groundwater appears to flow to the east-southeast. In May 2016 DEQ installed an additional four recovery wells and five (5) piezometers in the area of the former refueling area and free product recovery system. Depth to water in these wells ranged from 3 to 12 feet depending on the well locations. Product thicknesses in certain wells in this area range between 0.04 to 0.74 feet. Based upon previous investigations the depth to petroleum impacted soils is approximately 8 feet below ground surface.

Petroleum hydrocarbon contamination at the railyard is impacting the regional groundwater aquifer and surface and subsurface soils at concentrations about DEQ Risk Based Screening Levels (RBSLs; e.g. 3,240 mg/kg C9-C18 Aliphatics and 1,160mg/kg C11-C22 Aromatics). Up to 2 feet of spilled diesel remains floating on top of the site's groundwater. This diesel product contains

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multiple carcinogenic and non-carcinogenic compounds with concentrations up to 400 times their respective RBSLs (e.g. 1,090 mg/kg-dry for Naphthalene and 333,000 mg/kg-dry for C19-C36 Aliphatics). The historic railyard's proximity to the adjacent wetland and tributary of the Musselshell River means that this contamination is impacting both wetlands and surface water. Surface water in the east excavation pond still exceeds DEQ's Screen for Total Extractable Hydrocarbons at 1530 µg/L. This can be explained by soils along the bank of the east excavation still having concentrations exceeding both direct contact and leaching to groundwater RBSLs.

Proposed Alternative – Potentially direct and indirect, minor to major, short- to long-term, recurring adverse impacts to surface and ground waters surrounding the project area. The project will excavate and dispose of asbestos debris found within the railyard dump at the Great Falls landfill, which poses an immediate risk to human health given the location of the dump adjacent to the floodway. If not properly addressed, the asbestos contamination has the potential to be continuously disturbed and dispersed throughout the Musselshell River floodplain. This asbestos also poses health risks to aquatic organisms, fish, and terrestrial wildlife that use water sources in the area. This disposal alternative will prevent the uncontrolled spread of asbestos debris and provide a safe and permanent solution to this public health and environmental risk, an overall beneficial impact to water quality. By coordinating funding from this RDG grant with a 2018 RRGL grant, the removal of contaminated soils will also facilitate the restoration of the historic wetland into a regional nature trail/wetland wildlife viewing park, which is safe, functional, and attractive to humans and wildlife.

No Action Alternative – Potentially direct and indirect, minor to major, short- to long-term, recurring adverse impacts to water quality, quantity and distribution. The surface waters and floodplain will continue to be at a high risk of potential contamination and be a source of human and ecological exposures to carcinogenic substances.

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6. AIR QUALITY:

What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

The proposed project is not located in an air quality Nonattainment Area, as set by the U.S. Environmental Protection Agency's National Ambient Air Quality Standards. The project area is not listed as impaired in air quality pollutants per the Montana DEQ Air Quality Nonattainment Status List (Montana DEQ Air Quality website). No permitted air quality sources were identified within 1/2-mile of the project area (NEPAssist).

Currently, petroleum contaminants contained in the ground soil have the potential to be volatilized and enter the surrounding air.

Proposed Alternative – Potentially direct, minor, short-term, localized adverse impacts to air quality as there may be some dust introduced to the environment from construction activity and/or exhaust fumes from operation of heavy construction equipment. The contractor will need to provide dust control measures and should limit construction working hours to approximately 7 AM to 7 PM. The project will remove the petroleum contaminated soil which will prevent contaminants from being able to volatize into the surrounding air.

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No Action Alternative – Potentially direct, minor to major, short-term, localized adverse impacts to air quality if contamination is left in place. If not removed, soils contaminated with petroleum could be disturbed and carcinogenic contaminants could be volatized into the surround air, which poses a serious adverse risk to organisms that may breathe in the compounds.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

Vegetation within the project area is mostly disturbed, bare soil. The project area is adjacent to land classified as riparian forested/shrub, freshwater forested/shrub and freshwater emergent wetland by the National Wetlands Inventory (NWI). The land adjacent to the project area identified as riparian forested/shrub and freshwater forested/shrub exists along the Musselshell River. This riverine section forms a boundary on the south side of the project area. According to the Montana Natural Heritage Program (MTNHP) Environmental Summary, this type of riparian area is dominated by erect, rooted herbaceous vegetation present during most of the growing season. There are 15 plant species identified as present or potentially present at the project site:

Crawe's Sedge	*Carex crawei*
Panic Grass	*Dichanthelium acuminatum*
Platte Cinquefoil	*Potentilla plattensis*
Musk-root	*Adoxa moschatellina*
Schweinitz's Flatsedge	*Cyperus schweinitzii*
Fleshy Stitchwort	*Stellaria crassifolia*
Long-sheath Waterweed	*Elodea bifoliata*
Small Yellow Lady's-slipper	*Cypripedium parviflorum*
Snow Indian Paintbrush	*Castilleja nivea*
Smooth Goosefoot	*Chenopodium subglabrum*
Silver Bladderpod	*Physaria ludoviciana*
Kalm's Lobelia	*Lobelia kalmii*
Small Dropseed	*Sporobolus neglectus*

No farmland or agricultural land exists in the project area. According to the FWS, no critical habitat exists within the project. There is currently asbestos debris in the soils of the dump and land farm. In addition, there is a high concentration of petroleum contamination in soils and free product floating on groundwater in areas adjacent to terrestrial, avian, and aquatic life and habitats.

Proposed Alternative – Potentially direct, minor to major, short-term, localized adverse impacts to vegetation cover, quantity, and quality during remediation. Contaminated soils will be removed during construction and associated plants will be destroyed in the removal process; however the project area will be revegetated after construction is complete. Efforts should be made to preserve existing vegetation during construction when possible, and BMPs should be installed and monitored per the MPDES CGP, SWPPP, and other required permits. Overall, the project activities can be expected to have a beneficial impact to vegetation, as contaminated soils are likely hindering plant growth and remediation will benefit existing plant communities and potentially allow for new plants to be established in healthy soils.

No Action Alternative – Potentially direct, minor, short-term, localized adverse impacts to

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vegetation cover, quantity and quality if contamination is left in place. Vegetation is negatively affected by petroleum products and if left in place, the contaminated soil could have a significant adverse impact to wetland areas within and adjacent to the project area.

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8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:
Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

Project location is not identified as a priority area for terrestrial conservations effort within the Montana State Wildlife Action Plan (SWAP). The project does not exist within boundaries for Montana Sage Grouse habitat. Harlowton is identified as an Exempt Community on the Montana Sage Grouse Habitat Conservation Program map. According to the USFWS no critical habitats are at this project site (IPaC report). Riparian forested/shrub, freshwater forested/shrub and freshwater emergent wetland exists on the southern boundary of the project.

Records from the MTNHP indicate the project area there are 15 species of concern in and around the project region including the following:

Small Dropseed	*Sporobolus neglectus*
Northern Redbelly Dace	*Chrosomus eos*
Bald Eagle	*Haliaeetus leucocephalus*
Long-billed Curlew	*Numenius americanus*
Mountain Plover	*Charadrius montanus*
Veery	*Catharus fuscescens*
Thick-billed Longspur	*Rhynchophanes mccownii*
Ferruginous Hawk	*Buteo regalis*
Bobolink	*Dolichonyx oryzivorus*
Chestnut-collared Longspur	*Calcarius ornatus*
Baird's Sparrow	*Centronyx bairdii*
Evening Grosbeak	*Coccothraustes vespertinus*
Green-tailed Towhee	*Pipilo chlorurus*
Greater Short-horned Lizard	*Phrynosoma hernandesi*
Hoary Bat	*Lasiurus cinereus*
Bat Roost (Non-Cave)	Bat Roost (Non-Cave)

Important animal habitat includes non-cave bat roosts. MTNHP records indicate 72 other observed and potential animal and plant species of concern may exist in the area:

Eastern Screech-Owl	*Megascops asio*
Yellow-billed Cuckoo	*Coccyzus americanus*
Eastern Bluebird	*Sialia sialis*
Barrow's Goldeneye	*Bucephala islandica*
Short-eared Owl	*Asio flammeus*
White-faced Ibis	*Plegadis chihi*
Chimney Swift	*Chaetura pelagica*

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Rufous Hummingbird	*Selasphorus rufus*
Cassin's Finch	*Haemorhous cassinii*
Sage Thrasher	*Oreoscoptes montanus*
Pinyon Jay	*Gymnorhinus cyanocephalus*
American Bittern	*Botaurus lentiginosus*
Sharp-tailed Grouse	*Tympanuchus phasianellus*
Sprague's Pipit	*Anthus spragueii*
Common Poorwill	*Phalaenoptilus nuttallii*
Greater Sage-Grouse	*Centrocercus urophasianus*
Clark's Nutcracker	*Nucifraga columbiana*
Loggerhead Shrike	*Lanius ludovicianus*
Burrowing Owl	*Athene cunicularia*
Ovenbird	*Seiurus aurocapilla*
Black-billed Cuckoo	*Coccyzus erythropthalmus*
Plumbeous Vireo	*Vireo plumbeus*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Lewis's Woodpecker	*Melanerpes lewis*
Common Tern	*Sterna hirundo*
Great Blue Heron	*Ardea herodias*
American White Pelican	*Pelecanus erythrorhynchos*
Golden Eagle	*Aquila chrysaetos*
Brewer's Sparrow	*Spizella breweri*
Black-necked Stilt	*Himantopus mexicanus*
Black Tern	*Chlidonias niger*
Forster's Tern	*Sterna forsteri*
Franklin's Gull	*Leucophaeus pipixcan*
Caspian Tern	*Hydroprogne caspia*
Monarch	*Danaus plexippus*
Suckley Cuckoo Bumble Bee	*Bombus suckleyi*
Berry's Mountainsnail	*Oreohelix strigosa berryi*
Arroyo Bluet	*Enallagma praevarum*
Blue-eyed Darner	*Rhionaeschna multicolor*
Brook Stickleback	*Culaea inconstans*
Grizzly Bear	*Ursus arctos*
Canada Lynx	*Lynx canadensis*
Merriam's Shrew	*Sorex merriami*
North American Porcupine	*Erethizon dorsatum*
Western Spotted Skunk	*Spilogale gracilis*
Eastern Red Bat	*Lasiurus borealis*
Dwarf Shrew	*Sorex nanus*
Little Brown Myotis	*Myotis lucifugus*
Long-eared Myotis	*Myotis evotis*
Fringed Myotis	*Myotis thysanodes*

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Preble's Shrew	*Sorex preblei*
Silver-haired Bat	*Lasionycteris noctivagans*
Townsend's Big-eared Bat	*Corynorhinus townsendii*
Hayden's Shrew	*Sorex haydeni*
Spotted Bat	*Euderma maculatum*
Black-tailed Prairie Dog	*Cynomys ludovicianus*
Long-legged Myotis	*Myotis volans*
Crawe's Sedge	*Carex crawei*
Panic Grass	*Dichanthelium acuminatum*
Platte Cinquefoil	*Potentilla plattensis*
Musk-root	*Adoxa moschatellina*
Schweinitz's Flatsedge	*Cyperus schweinitzii*
Fleshy Stitchwort	*Stellaria crassifolia*
Long-sheath Waterweed	*Elodea bifoliata*
Small Yellow Lady's-slipper	*Cypripedium parviflorum*
Snow Indian Paintbrush	*Castilleja nivea*
Smooth Goosefoot	*Chenopodium subglabrum*
Silver Bladderpod	*Physaria ludoviciana*
Kalm's Lobelia	*Lobelia kalmii*
Spiny Softshell	*Apalone spinifera*
Western Milksnake	*Lampropeltis gentilis*
Northern Leopard Frog	*Lithobates pipiens*

Proposed Alternative – Potentially direct, negligible, short-term, local, non-recurring adverse impacts to terrestrial, avian, and aquatic life and habitats during construction. The project area is largely comprised of undeveloped property. The primary disturbance will likely occur on City property and the contractor will be required to restore any disturbance to preexisting conditions. The removal of contamination and the subsequent restoration of the adjacent historic wetland, will improve spawning grounds for aquatic species, provide improved habitat to terrestrial species, and increase the health and diversity of the regional flora and fauna.

No Action Alternative – No impacts to terrestrial, avian, and aquatic life and habitats.

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9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:
Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

The project is located within the urban limits of the city of Harlowton and is within the historic Harlowton Roundhouse Facility; as a result, there will be no impact on unique or endangered species. The project area is adjacent to land classified as riparian forested/shrub, freshwater forested/shrub, and freshwater emergent wetland by the National Wetlands Inventory (NWI). The land adjacent to the project area identified as riparian forested/shrub and freshwater forested/shrub exists along the Musselshell River. This riverine section forms a boundary on the south side of the project area. According to the Natural Heritage Program (MTNHP) Environmental Summary, this type of riparian area is dominated by erect, rooted herbaceous vegetation present

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during most of the growing season. Historic wetlands were filled in during the operation of the Harlowton Milwaukee Roundhouse Facility from 1900 to 1979.

Endangered species listed on the attached IPaC report include North American Wolverine (*Gulo gulo luscus*) and Monarch Butterfly (*Danaus plexippus*). Bald and Golden Eagles are identified in the project area, and they are protected under the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918. Fifteen Migratory Bird Species were identified, all of which are also covered by the Migratory Bird Treaty Act:

Baird's Sparrow	*Centronyx bairdii*
Bald Eagle	*Haliaeetus leucocephalus*
Black Tern	*Chlidonias niger*
Bobolink	*Dolichonyx oryzivorus*
California Gull	*Larus californicus*
Chestnut-collared Longspur	*Calcarius ornatus*
Ferruginous Hawk	*Buteo regalis*
Franklin's Gull	*Leucophaeus pipixcan*
Golden Eagle	*Aquila chrysaetos*
Lark Bunting	*Calamospiza melanocorys*
Marbled Godwit	*Limosa fedoa*
Mountain Plover	*Charadrius montanus*
Prairie Falcon	*Falco mexicanus*
Sprague's Pipit	*Anthus spragueii*
Willet	*Tringa semipalmata*

Proposed Alternative – Potentially direct, negligible, short-term, local, non-recurring adverse impacts to endangered, fragile, or limited environmental resources during construction. One of the activities proposed in the fifth phase of cleanup at the site is to prepare the site so that the City can use their 2018 RRGL Project Grant to restore the historic wetland into a regional nature trail/wetland wildlife viewing park, which would have an overall beneficial impact to the project area. The minimal disturbance caused by the project should not impact any sensitive environmental resources. Efforts should be made to preserve existing vegetation where applicable, and disturbance of wetland habitat is not expected. BMPs should be installed and monitored per the MPDES CGP and SWPPP, and any other required permits.

No Action Alternative – No impacts to unique, endangered, fragile, or limited environmental resources.

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10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

A cultural survey has been performed per State Historical Preservation Office (SHPO) Section 106. Two historic railyard towers exist within the proposed project area. These towers are contributing features in the Milwaukee Road Historic District's listing on the National Register of Historic Places.

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Proposed Alternative – No cultural or historical resource impacts are anticipated. The injection of chemical oxidant underneath the site's nationally registered historic rail towers will allow these towers to remain in their current location on-site. Additionally, SHPO has approved an archeological survey, using Brownfields funds, to mitigate any impacts. However, if previously unknown cultural or paleontological materials are identified during project-related activities, all work will cease until a professional assessment of such resources can be made.

No Action Alternative – No cultural or historical resource impacts are anticipated.

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11. AESTHETICS:

Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

The project area is located within the city limits of Harlowton, Montana, and is visible to local property owners. Current aesthetic conditions include open, barren soils and deteriorating facilities.

Proposed Alternative – Potentially direct and indirect, negligible to minor, short-term, local, non-recurring adverse impacts to aesthetics during construction. Indirect, adverse nuisance impacts from heavy construction equipment will be temporary during the project and may include noise, exhaust fumes, and light. Noise mitigation techniques to minimize impacts to the surrounding areas will be used by the contractor whenever possible. Construction working hours should be limited to 7 AM to 7 PM. This action will remove asbestos debris and junk piles and remaining solid waste present at the site as well as provide an aesthetically pleasing regional nature park and wetland. In some cases, visual quality and aesthetics will be improved from planned activities for the project, an overall beneficial impact to aesthetics.

No Action Alternative – No impacts to aesthetics.

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12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

The current condition has no effect on energy resources. No additional resources are expected to be used.

Proposed Alternative and No Action Alternative – No impacts to demands on environmental resources of land, water, air, or energy. The project is not anticipated to have impacts on energy consumption or conservation, and/or solid waste.

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13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

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Previous Investigations and Remedial Actions at this Facility include:

- Program Site Investigation; Performed for the Montana Department of Health and Environmental Services (became DEQ) and EPA CERCLA in June 1993
- Program Preliminary Assessment; Performed for the Montana Department of Health and Environmental Services (became DEQ) and EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in March 1994
- DNRC RDG Planning Grant funded Laser Induced Fluorescence (LIF) Investigation, Performed in collaboration with the DEQ, December 2015
- DEQ Orphan Share Account Funded Soils Characterization, Excavation, and Delineation Interim Action, October 2016 – April 2017
- DNRC RDG Planning Grant funded additional source area investigation, Performed in collaboration with the DEQ, March 2018
- DNRC RRGL Planning Grant funded wetland vision and design, Performed in collaboration with the DEQ, April 2018
- DNRC RRGL Planning Grant funded the proposal to the DNRC Regional office to consider this project as restoration of a historic wetland and therefore any surface water created from open excavations would be exempt from requiring a water right if it exceeded 10 acre-feet. Based upon this determination the wetland visioning and design have been modified in collaboration with the City, DEQ, and a local wetland citizens group, June 2019 – May 2020
- DNRC RDG Planning Grant funded an Asbestos Inspection of debris in Overburden Soils, Performed in collaboration with DEQ, August 2019 – December 2019
- DNRC RDG Project Grant funded the excavation and landfarming of 5,600 cubic yards of petroleum contaminated soils and the removal of 2 USTs, Performed in collaboration with DEQ, October – December 2019
- DNRC RDG Planning Grant funded the investigation of remaining potential sources of contamination (i.e. the Railyard Dump, the Transformer rack for PCBs, and the Slough/Wetlands), Performed in collaboration with DEQ, October 2021
- DNRC RDG Project Grant and DEQ Orphan Share Account funded excavation and disposal of the approximate 3000 cubic yards of asbestos debris contaminated soils, Performed in collaboration with DEQ, September – November 2021
- DEQ 2021 Special Legislative Funded excavation and removal of a 15,000 gallon tanker-railcar, February 2022
- DNRC RDG Project Grant funded excavation and disposal in new on-site one-time landfarm of 2,400 cubic yards of metals and petroleum (mixed waste) contaminated soils, March 2022.

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

In 2021, the City used a DNRC Planning grant to investigate the nature and extent of contamination

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found within the historic railyard dump. While no petroleum, metals, or chlorinated solvents were detected above DEQ generic screening levels; asbestos debris was encountered throughout the historic dump. In 2022, the City used its 2016 DRNC RDG Project grant to excavate and dispose of approximately 2,400 cubic yards of soils contaminated with both petroleum and metals (mixed waste soils) exceeding residential screening levels. The metals concentrations found in this pocket of mixed waste soils exceeded residential but not recreational screening levels. This residential exceedance prevented the treatment and disposal of this contamination in the major one-time landfarm. Therefore, the City applied for and was permitted a minor one-time landfarm on the railyard property to treat the petroleum contamination found in this mixed waste soils. Once the petroleum contamination has been treated, the city will be able to use this soil as on-site backfill. The removal of the asbestos and mixed waste soils will allow the City to excavate a significant portion of the remaining contamination using their 2020 DNRC RDG Project grant in the Fall of 2022 and Spring of 2023 (Phase 4).

The site poses a threat to public health and safety. Analyses of the site have shown contaminants including petroleum, asbestos and metals exceeding DEQ and EPA human health levels. These contaminants can cause significant human health issues. The site is currently closed to public access due to contamination.

Proposed Alternative – Potentially direct and indirect, minor, short-term, non-recurring, localized adverse impacts to human health and safety. Heavy equipment would be used during the proposed remediation, which poses a potential threat to public safety. There should be no impact during construction, but the typical risk to the public's safety may be increased during construction. BMPs should be installed to protect the public from the active construction site and to mitigate dust exposure, particularly around schools and other areas where there are higher-risk or sensitive residents. Once completed, the project will provide direct beneficial impacts to human health and safety by reducing the threat of soil contamination and leaching to groundwater. The permanent removal of contaminants on the site will reduce the potential for the public to come in contact with the contaminated soil, reduce the potential for the contaminants to impact drinking water wells, and provide a safe and permanent solution to this public health and environmental risk.

No Action Alternative – Potentially direct, negligible to major, short- to long-term, local, recurring adverse impacts may occur to human health and safety due to soil contaminated with hydrocarbons, heavy metals and asbestos.

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15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:
Identify how the project would add to or alter these activities.

The project site is located within the City of Harlowton. This project, and the contamination associated with it, is located up-gradient to multiple regional agricultural lands along the banks of the Musselshell River. A custom Soil Resource Report by the NRCS shows that within a mile of the project boundary there is prime farmland of statewide and local importance.

Proposed Alternative – Potentially direct, negligible, short- to long-term, local, recurring beneficial impacts to agriculture activities and production by restoring the historic wetlands and the floodplain which will help mitigate flood damages to regional agricultural lands along the banks of the Musselshell River. No business or residents will be relocated for this project. The constructed regional nature trail/wetland wildlife viewing park will increase public access to the site for recreation and could increase economic benefits in the community.

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No Action Alternative – No impacts to industrial, commercial and agriculture activities and production.

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16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

The project area is primarily within a residential and commercial area in the city of Harlowton. According to data from the Montana Department of Commerce's Census and Economic Information Center, in 2022 Harlowton had a population of 933 people with a median age of 47.5 and a median household income of $47,212. The county of Wheatland had 2,032 people as of 2022. In 2021, 75.6% percent of the residents in the city lived at or above the poverty level, and 24.4% lived below the poverty level.

Proposed Alternative – Potentially direct and indirect, non-recurring beneficial impacts to quantity or distribution of employment. The construction of the project may temporarily bring local job opportunities that were not previously present. The City may experience long-term economic benefits from the establishment of the regional nature trail/wetland wildlife viewing park.

No Action Alternative – No impacts to quantity and distribution of employment.

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17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

Since 1985, the property has been tax exempt because it is owned by the city of Harlowton.

Proposed Alternative and No Action –No impact as the project is remediation of county-owned property. Redevelopment of the property is slated to be mostly recreational, and no change of tax revenues or bases would be expected.

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18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

Work is to be completed on the city parcel and there may be changes necessary to traffic patterns, fire protection, police, schools, or other government services.

Proposed Alternative – Potential indirect, minor, short-term, local, non-recurring adverse impacts to the demand for government services. Construction work may require road closures or traffic control at times, which could hinder the ability of government services, such as police, fire, health, or other services.

No Action Alternative – No impacts on demand for government services.

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19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

Use of the City property is restricted due to the contamination at the site.

Proposed Alternative – Potentially direct beneficial impacts to locally adopted environmental plans and goals. The removal of contamination and the subsequent establishment of a regional nature trail/wetland wildlife viewing park will provide public access to 180 acres of open space along the banks of the Musselshell River. The City, DEQ, and Snowy Mountain Development Corporation collaborated on a 2021 Redevelopment Concept Plan to determine the best use for the City owned 180-acre historic railyard. This concept plan took into consideration the public's and City's desired growth and land use policies

No Action Alternative - Continued potential for minor to major, short- to long-term, local, recurring adverse impacts to locally adopted environmental plans and goals. Soil and groundwater contamination with the potential to leach contaminants to the groundwater and release to the Musselshell River is a threat to environmental plans and goals.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

The project is not located in or on a designated recreational, Wild & Scenic River, or Wilderness Area. Due to the presence of hazardous contaminants, the area is currently fenced-off to prevent people from entering the area and potentially being exposed to the contaminants.

Proposed Alternative – Direct beneficial impacts to access to and quality of recreational and activities. The preferred alternative will significantly benefit safe public access and recreational use. Once remediated, the City intends to redevelop the land as open space/park and recreation space, restoring public access to approximately 1-mile of the Musselshell River. Removing the contaminants will allow people to safely use the area.

No Action Alternative – Direct, long-term, localized, recurring adverse impacts on the access to and quality of recreational activities. Soil and groundwater contamination is present and will continue to be a threat to human health and safety, and this area will remain off-limits to public use.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

Property within the project area is currently vacant and off limits to the public due to contamination. The land use within the project area is anticipated to have limited growth expected in the future and will be undeveloped recreational/open space property.

Proposed Alternative – The project is not anticipated to impact the density and distribution of population and housing. It is possible that the improvement to the quality and quantity of natural

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resources found in this area such as soil, groundwater, surface water, wetlands, fish, wildlife, and natural aquatic and terrestrial ecosystems will have the indirect benefit of attracting visitors from across the region and become an economic driver for Harlowton's economy. This recreational asset may also help attract individuals and businesses looking to relocate to a smaller community but still desire access to quality public outdoor recreational facilities.

No Action Alternative – No impacts to density and distribution of population.

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22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

Social conduct, structures, and behaviors follow conventions that are typical of the City of Harlowton and the surrounding valley. The City of Harlowton is located on the traditional territory of the following indigenous peoples:

- Cayuse, Umatilla and Walla Walla
- Apsaalooke (Crow)
- Salish
- Tsestho'e (Cheyenne)
- Ochethi Sakowin
- Niitsitpiis-stahkoli (Blackfoot)

Proposed Alternative and No Action Alternative – No impacts or changes to social structures are expected to occur.

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23. CULTURAL UNIQUENESS AND DIVERSITY:

How would the action affect any unique quality of the area?

Two historic railyard towers exist within the proposed project area. These towers are contributing features in the Milwaukee Road Historic District's listing on the National Register of Historic Places. Soil contamination exists adjacent to and underneath the tower structures.

Proposed Alternative – The proposed will have an overall beneficial impact to the historical uniqueness of the project area by addressing impacts to the natural resources (soils and the regional aquifer) at the site through the *in-situ* treatment of petroleum contamination beneath the historic rail towers and the excavation of asbestos debris from within the former railyard dump. The rail towers will remain in place and the contaminated soils underneath will be remediated without having to remove the unique features.

No Action Alternative – No impacts to cultural uniqueness and diversity.

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24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

The facility is currently vacant land and is fenced-off from public use.

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Proposed Alternative – Potentially direct and indirect, beneficial impacts to social and economic circumstances. Workers and materials required for the construction of the project may provide temporary beneficial impacts to local businesses throughout construction. Redevelopment of the property has the potential to improve economic opportunities adjacent to the site.

No Action Alternative – No impact on other appropriate social and economic circumstances.

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25. DRINKING WATER AND/OR CLEAN WATER

Identify potential impacts to water and/or sewer infrastructure (e.g., community water supply, stormwater, sewage system, solid waste management) and identify direct, indirect, and cumulative effects likely to occur as a result of the proposed action.

The soil and groundwater beneath the site have been contaminated by historic operations at the site. The City of Harlowton has three active source water wells for drinking water (MT0000240). Because of the groundwater contamination at the site, there is a potential impact to both private and public wells. The project does not currently impact wastewater treatment or solid waste management but does impact the transport of storm water and surface drainage.

Proposed Alternative – Potentially direct, negligible to minor, short-term, local, nonrecurring adverse impacts to storm water and surface drainage. During the construction period, there is the potential for storm water runoff through construction areas to mobilize pollutants from the soil. A MPDES Construction General Permit and Stormwater Pollution Prevention Plan will be prepared, and Best Management Practices will be installed and maintained by the contractor to mitigate sediment deposition into the Musselshell River. Direct and indirect beneficial impacts to drinking water and clean water will result from the completion of the construction, as contaminated soils and groundwater will be removed and further impacts to drinking water will be controlled. Removing the contaminated soil will significantly reduce the potential of contaminated groundwater impacting public and private drinking water wells, and focused groundwater monitoring will continue to evaluate the extent of the groundwater contamination.

No Action Alternative – Potentially minor to major, short- to long-term, local, recurring adverse impacts to drinking water and/or clean water. Continued presence of contaminated soil will perpetuate the potential to leach contaminants to the groundwater and adversely impact private and public drinking water wells.

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25. ENVIRONMENTAL JUSTICE

Will the proposed project result in disproportionately high or adverse human health or environmental effects on minority or low-income populations per the Environmental Justice Executive Order 12898? Identify potential impacts to and identify direct, indirect, and cumulative effects likely to occur as a result of the proposed action.

The Chicago, Milwaukee, St. Paul, and Pacific Railroad Company's Harlowton Milwaukee Roundhouse Facility operated as a railroad engine repair and fueling facility from 1900 to 1979. The Milwaukee Road went bankrupt in 1980 and reorganized as CMC Heartland Partners. CMC Heartland Partners transferred the ownership of the site to the City of Harlowton in 1985 and the City has remained the owner. The adjacent neighborhoods have borne the impacts of transportation activities. In 2021, 75.6% percent of the residents in the city lived at or above the poverty level, and 24.4% lived below the poverty level (US Census Bureau).

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Proposed Alternative – Potentially minor, long-term, local, recurring beneficial impacts to environmental justice. The proposed project will remediate onsite contamination and position the site for redevelopment into recreation/open space. The removal of contamination and the subsequent establishment of a regional nature trail/wetland wildlife viewing park will provide the public access to 180 acres of open space along the banks of the Musselshell River. This will provide lower income households free recreational alternatives and public access to the Musselshell River.

No Action Alternative – Potentially minor to major, short- to long-term, local, recurring adverse impacts to the community. Continued soil contamination with the potential to leach contaminants to the groundwater will disproportionately impact the human and environmental health of the quarter of the city's population who are living below the poverty line.

EA Prepared By:	**Name:**	Samantha Treu	**Date:**	01/03/2024
	Title:	MEPA/NEPA Coordinator	**Email:**	samantha.treu@mt.gov

V. FINDING

26. ALTERNATIVE SELECTED:

Alternative 3 – Limited In-situ Chemical Oxidation of Remaining Petroleum Contamination and Excavation of Asbestos Contamination. (Preferred Alternative):
This alternative includes two rounds of chemical oxidation underneath historic rail structures. The cost of two rounds of chemical oxidant injection is comparable to that of demolition of the rail towers and excavation. The cost of two rounds of oxidant injection to treat 400 cubic yards (approximately $110/yard) is estimated at $88,000. This alternative has the added benefit of keeping the historical legacy and integrity of the railyard and the community intact. Estimated excavation and disposal costs of the former dump is approximately $240,000.

27. SIGNIFICANCE OF POTENTIAL IMPACTS:

Project activities will have no significant adverse impacts on natural or human environments. Below are the minor adverse impacts that can be anticipated from project activities:

GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:
Potentially direct and indirect, minor, short- to long-term, localized adverse impacts to soil quality, stability, and moisture from construction activities. Large construction equipment can be expected to compact soils and damage soil profiles during excavation. Adverse impacts are temporary and limited to construction activities. The proposed project will have significant, direct and indirect, long-term beneficial impacts to soil quality, as it will permanently remove contaminated soil at the site. The shallow depth of contamination and types of soils at this site allow for the contamination to be easily excavated and removed from the site. All remediation work will follow appropriate remediation techniques and ensure safe removal and minimal disturbances to surrounding topography.

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WATER QUALITY, QUANTITY AND DISTRIBUTION:

Potentially direct and indirect, minor to major, short- to long-term, recurring adverse impacts to surface and ground waters surrounding the project area. The project will excavate and dispose of asbestos debris found within the railyard dump at the Great Falls landfill, which poses an immediate risk to human health given the location of the dump adjacent to the floodway. If not properly addressed, the asbestos contamination has the potential to be continuously disturbed and dispersed throughout the Musselshell River floodplain. This asbestos also poses health risks to aquatic organisms, fish, and terrestrial wildlife that use water sources in the area. This disposal alternative will prevent the uncontrolled spread of asbestos debris and provide a safe and permanent solution to this public health and environmental risk, an overall beneficial impact to water quality. By coordinating funding from this RDG grant with a 2018 RRGL grant, the removal of contaminated soils will also facilitate the restoration of the historic wetland into a regional nature trail/wetland wildlife viewing park, which is safe, functional, and attractive to humans and wildlife.

AIR QUALITY:

Potentially direct, minor, short-term, localized adverse impacts to air quality as there may be some dust introduced to the environment from construction activity and/or exhaust fumes from operation of heavy construction equipment. The contractor will need to provide dust control measures and should limit construction working hours to approximately 7 AM to 7 PM. The project will remove the petroleum contaminated soil which will prevent contaminants from being able to volatize into the surrounding air.

VEGETATION COVER, QUANTITY AND QUALITY:

Potentially direct, minor to major, short-term, localized adverse impacts to vegetation cover, quantity, and quality during remediation. Contaminated soils will be removed during construction and associated plants will be destroyed in the removal process; however the project area will be revegetated after construction is complete. Efforts should be made to preserve existing vegetation during construction when possible, and BMPs should be installed and monitored per the MPDES CGP, SWPPP, and other required permits. Overall, the project activities can be expected to have a beneficial impact to vegetation, as contaminated soils are likely hindering plant growth and remediation will benefit existing plant communities and potentially allow for new plants to be established in healthy soils.

TERRESTRIAL, AVIAN, AND AQUATIC LIFE AND HABITATS:

Potentially direct, negligible, short-term, local, non-recurring adverse impacts to terrestrial, avian, and aquatic life and habitats during construction. The project area is largely comprised of undeveloped property. The primary disturbance will likely occur on
City property and the contractor will be required to restore any disturbance to preexisting conditions. The removal of contamination and the subsequent restoration of the adjacent historic wetland, will improve spawning grounds for aquatic species, provide improved habitat to terrestrial species, and increase the health and diversity of the regional flora and fauna.

UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Potentially direct, negligible, short-term, local, non-recurring adverse impacts to endangered, fragile, or limited environmental resources during construction. One of the activities proposed in the fifth phase of cleanup at the site is to prepare the site so that the City can use their 2018 RRGL Project Grant to restore the historic wetland into a regional nature trail/wetland wildlife viewing park, which would have an overall beneficial impact to the project area. The minimal disturbance caused by the project should not impact any sensitive environmental resources. Efforts should be made to preserve existing vegetation where applicable, and disturbance of wetland habitat is not

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expected. BMPs should be installed and monitored per the MPDES CGP and SWPPP, and any other required permits.

AESTHETICS:

Potentially direct and indirect, negligible to minor, short-term, local, non-recurring adverse impacts to aesthetics during construction. Indirect, adverse nuisance impacts from heavy construction equipment will be temporary during the project and may include noise, exhaust fumes, and light. Noise mitigation techniques to minimize impacts to the surrounding areas will be used by the contractor whenever possible. Construction working hours should be limited to 7 AM to 7 PM. This action will remove asbestos debris and junk piles and remaining solid waste present at the site as well as provide an aesthetically pleasing regional nature park and wetland. In some cases, visual quality and aesthetics will be improved from planned activities for the project, an overall beneficial impact to aesthetics.

HUMAN HEALTH AND SAFETY:

Potentially direct and indirect, minor, short-term, non-recurring, localized adverse impacts to human health and safety. Heavy equipment would be used during the proposed remediation, which poses a potential threat to public safety. There should be no impact during construction, but the typical risk to the public's safety may be increased during construction. BMPs should be installed to protect the public from the active construction site and to mitigate dust exposure, particularly around schools and other areas where there are higher-risk or sensitive residents. Once completed, the project will provide direct beneficial impacts to human health and safety by reducing the threat of soil contamination and leaching to groundwater. The permanent removal of contaminants on the site will reduce the potential for the public to come in contact with the contaminated soil, reduce the potential for the contaminants to impact drinking water wells, and provide a safe and permanent solution to this public health and environmental risk.

DEMAND FOR GOVERNMENT SERVICES:

Potential indirect, minor, short-term, local, non-recurring adverse impacts to the demand for government services. Construction work may require road closures or traffic control at times, which could hinder the ability of government services, such as police, fire, health, or other services.

DRINKING WATER AND/OR CLEAN WATER:

Potentially direct, negligible to minor, short-term, local, nonrecurring adverse impacts to storm water and surface drainage. During the construction period, there is the potential for storm water runoff through construction areas to mobilize pollutants from the soil. A MPDES Construction General Permit and Stormwater Pollution Prevention Plan will be prepared, and Best Management Practices will be installed and maintained by the contractor to mitigate sediment deposition into the Musselshell River. Direct and indirect beneficial impacts to drinking water and clean water will result from the completion of the construction, as contaminated soils and groundwater will be removed and further impacts to drinking water will be controlled. Removing the contaminated soil will significantly reduce the potential of contaminated groundwater impacting public and private drinking water wells, and focused groundwater monitoring will continue to evaluate the extent of the groundwater contamination.

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28. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

This is the final environmental assessment. DNRC concluded that no significant adverse impacts will occur as a result of the proposed project work, and therefore no additional environmental review is required. This environmental assessment was posted for a 30-day

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public comment period. No public comments were received, and the environmental review of this project is complete.

☐ EIS ☐ More Detailed EA ☒ No Further Analysis

EA Approved By:	**Name:** Mark W Bostrom **Title:** Division Administrator
Signature: Mark W Bostrom	**Date**: 2/2/2024

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NATURAL HERITAGE PROGRAM mtnhp.org
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Environmental Summary



Latitude	Longitude
46.40297	-109.79976
46.44645	-109.86273

Summarized by:
008N015E027
(Buffered PLSS Section)



Suggested Citation
Montana Natural Heritage Program. Environmental Summary Report.
for Latitude 46.40297 to 46.44645 and Longitude -109.79976 to -109.86273. Retrieved on 11/16/2023.

The Montana Natural Heritage Program is part of the Montana State Library's Natural Resource Information System. Since 1985, it has served as a neutral and non-regulatory provider of easily accessible information on Montana's species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. The program is part of the NatureServe network that is composed of over 60 member programs across North America that work to provide current and comprehensive distribution and status information on species and biological communities.

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Table of Contents

- Species Report
- Structured Surveys
- Land Cover
- Wetland and Riparian
- Land Management
- Biological Reports
- Invasive and Pest Species
- Introduction to Montana Natural Heritage Program
- Data Use Terms and Conditions
- Suggested Contacts for Natural Resource Agencies
- Introduction to Native Species
- Introduction to Land Cover
- Introduction to Wetland and Riparian
- Introduction to Land Management
- Introduction to Invasive and Pest Species
- Additional Information Resources

Introduction to Environmental Summary Report

Environmental Summary Reports from the Montana Natural Heritage Program (MTNHP) provide information on species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. For information on environmental permits in Montana, please see permitting overviews by the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Index of Environmental Permits for Montana and our Suggested Contacts for Natural Resource Management Agencies. The report for your area of interest consists of introductory and related materials in this PDF and an Excel workbook with worksheets summarizing information managed in the MTNHP databases for: (1) species occurrences; (2) other observed species without species occurrences; (3) other species potentially present based on their range, presence of associated habitats, or predictive distribution model output if available; (4) structured surveys that follow a protocol capable of detecting one or more species; (5) land cover mapped as ecological systems; (6) wetland and riparian mapping; (7) land management categories; and (8) biological reports associated with plant and animal observations. If your area of interest corresponds to a statewide polygon layer (e.g., watersheds, counties, or public land survey sections) information summaries in your report will exactly match those boundaries. However, if your report is for a custom area, users should be aware that summaries do not correspond to the exact boundaries of the polygon they have specified, but instead are a summary across a layer of hexagons intersected by the polygon they specified as shown on the report cover. Summarizing by these hexagons which are one square mile in area and approximately one kilometer in length on each side allows for consistent and rapid delivery of summaries based on a uniform grid that has been used for planning efforts across North America.

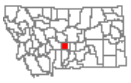
In presenting this information, MTNHP is working towards assisting the user with rapidly assessing the known or potential species and biological communities, land management categories, and biological reports associated with the report area. Users are reminded that this information is likely incomplete and may be inaccurate as surveys to document species are lacking in many areas of the state, species' range polygons often include regions of unsuitable habitat, methods of predicting the presence of species or communities are constantly improving, and information is constantly being added and updated in our databases. **Field verification by professional biologists of the absence or presence of species and biological communities in a report area will always be an important obligation of users of our data. Users are encouraged to only use this environmental summary report as a starting point for more in depth analyses and are encouraged to contact state, federal, and tribal resource management agencies for additional data or management guidelines relevant to your efforts. Please see the Appendix for introductory materials to each section of the report, additional information resources, and a list of relevant agency contacts.**

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Legend

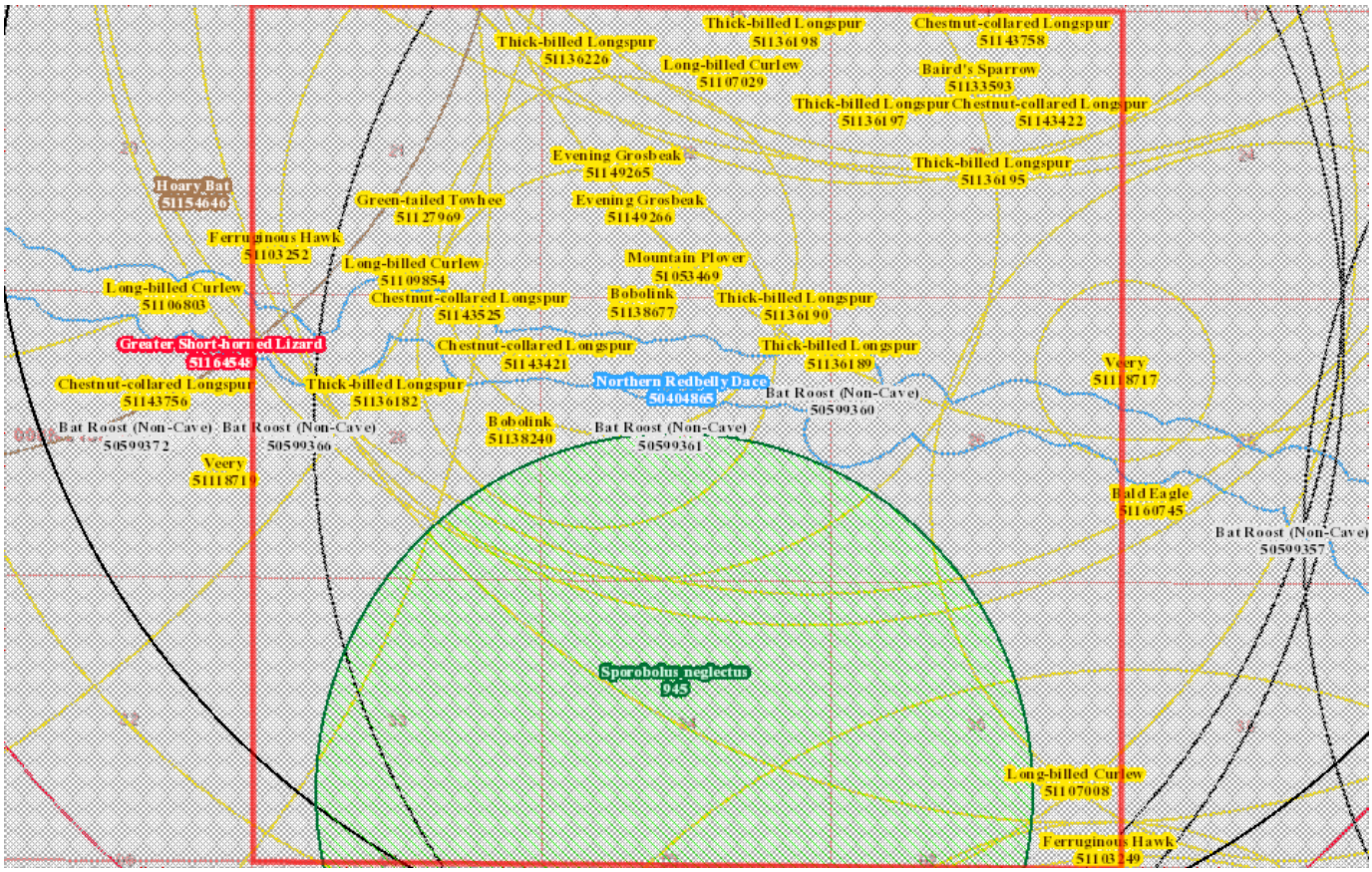
Model Icons	Habitat Icons	Range Icons	Num Obs
N Suitable (native range)	C Common	Y Native / Year-round	Count of obs with 'good precision' (<=1000m)
O Optimal Suitability	O Occasional	S Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
M Moderate Suitability		W Winter	
L Low Suitability		M Migratory	
I Suitable (introduced range)		N Non-native	
		H Historical	



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Native Species

Summarized by: **008N015E027** *(Buffered PLSS Section)*
Filtered by:
Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC



Species Occurrences

	USFWS Sec7	# SO	# Obs	Predicted Model	Range
V - Sporobolus neglectus *(Small Dropseed)* **SOC**		1			Y

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S1S2** Plant Threat Score: **No Known Threats**

Delineation Criteria Individual occurrences are generally based upon a discretely mapped area provided by an observer and are not separated by any pre-defined distance. Individual clusters of plants mapped at fine spatial scales (separated by less than approximately 25-50 meters) may be grouped together into one occurrence if they are not separated by distinct areas of habitat or terrain features. Point observations are buffered to encompass any locational uncertainty associated with the observation. (Last Updated: Jan 29, 2021)

Predicted Models: N 58% Suitable (native range) (deductive)

F - Northern Redbelly Dace *(Chrosomus eos)* **SOC**		1	1		Y

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** FWP SWAP: **SGCN3**

Delineation Criteria Stream reaches and standing water bodies where the species presence has been confirmed through direct capture or where they are believed to be present based on the professional judgement of a fisheries biologist due to confirmed presence in adjacent areas. In order to reflect the importance of adjacent terrestrial habitats to survival, stream reaches are buffered 100 meters, standing water bodies greater than 1 acre are buffered 50 meters, and standing water bodies less than 1 acre are buffered 30 meters into the terrestrial habitat based on PACFISH/INFISH Riparian Conservation Area standards. (Last Updated: Jul 18, 2022)

Predicted Models: N 47% Suitable (native range) (deductive)

B - Bald Eagle *(Haliaeetus leucocephalus)* **SSS**		1	8		Y

View in Field Guide | View Predicted Models | View Range Maps

Special Status Species - Native Species Global: **G5** State: **S4** USFWS: **BGEPA; MBTA** USFS: **Sensitive - Known in Forests (LOLO)** BLM: **SENSITIVE** PIF: **2**

Delineation Criteria Confirmed nesting area buffered by a minimum distance of 2,000 meters in order to be conservative about encompassing the breeding territory and area commonly used for renesting. Only nesting observations with a locational uncertainty of 1,000 meters or less will be used to delineate a nesting area. (Last Updated: Sep 05, 2023)

Predicted Models: O 4% Optimal (inductive), M 32% Moderate (inductive), L 54% Low (inductive)

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4 1 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 200 meters in order to approximate the breeding territory size reported for the species in Idaho and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 28, 2023)

Predicted Models: M 96% Moderate (inductive), L 4% Low (inductive)

M - Hoary Bat *(Lasiurus cinereus)* SOC

1 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G3G4** State: **S3B** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

Delineation Criteria Confirmed area of occupancy based on the documented presence (mistnet captures, definitively identified acoustic recordings, and definitively identified roosting individuals) of adults or juveniles during the active season. Point observation location is buffered by a minimum distance of 3,500 meters in order to be conservative about encompassing the maximum reported foraging distance for the congeneric Lasiurus borealis and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jul 06, 2023)

Predicted Models: M 36% Moderate (inductive), L 64% Low (inductive)

B - Mountain Plover *(Charadrius montanus)* SOC

1 1 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G3** State: **S2B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **1**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. When the observation is within a prairie dog town, the outer boundary of town (currently based on the grid-based delineation of 100m x 100m cells with evidence of prairie dog activity visible in aerial imagery) is used as the delineation of the breeding area. When the observation is not within a prairie dog town, the point observation location is buffered by a minimum distance of 550 meters in order to encompass the maximum brood rearing range size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. When prairie dog town boundaries or locational uncertainties associated with point observations overlap they will be merged into a common tracking unit associated with all of the observations contained within the tracking unit. (Last Updated: Jan 10, 2023)

Predicted Models: M 34% Moderate (inductive), L 41% Low (inductive)

B - Veery *(Catharus fuscescens)* SOC

2 2 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Observations with evidence of breeding activity buffered by a minimum distance of 300 meters in order to be conservative about encompassing home ranges and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 29, 2023)

Predicted Models: M 25% Moderate (inductive), L 29% Low (inductive)

B - Thick-billed Longspur *(Rhynchophanes mccownii)* SOC

7 2 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 100 meters in order to encompass the maximum breeding territory size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 29, 2023)

Predicted Models: M 21% Moderate (inductive), L 68% Low (inductive)

B - Ferruginous Hawk *(Buteo regalis)* SOC

3 7 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Confirmed nesting area buffered by a minimum distance of 2,000 meters in order to encompass the average home range size reported for the species and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 28, 2023)

Predicted Models: M 6% Moderate (inductive), L 94% Low (inductive)

B - Bobolink *(Dolichonyx oryzivorus)* SOC

3 5 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** FWP SWAP: **SGCN3** PIF: **3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 150 meters in order to conservatively encompass male territory size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 30, 2023)

Predicted Models: M 4% Moderate (inductive), L 76% Low (inductive)

R - Greater Short-horned Lizard *(Phrynosoma hernandesi)* SOC

1 Y

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN**

Delineation Criteria Confirmed breeding area based on the presence of a resident animal of any age. Point observation location is buffered by a minimum distance of 300 meters in order to encompass habitats supporting other individuals and documented distances moved betweeen summer and winter habitats. Otherwise the point observation is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Sep 22, 2023)

Predicted Models: L 75% Low (inductive)

B - Chestnut-collared Longspur *(Calcarius ornatus)* SOC

5 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S2B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 115 meters in order to encompass the maximum breeding territory size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 30, 2023)

Predicted Models: L 51% Low (inductive)

B - Baird's Sparrow *(Centronyx bairdii)* SOC

1 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 100 meters in order to encompass the average breeding territory size of the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 29, 2023)

Predicted Models: L 47% Low (inductive)

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2 3 Y WM

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 1,000 meters in order to encompass the maximum foraging distance from nests reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 30, 2023)

Predicted Models: L 39% Low (inductive)

B - Green-tailed Towhee *(Pipilo chlorurus)* SOC

1 S M

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 125 meters in order to encompass the breeding home range size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 29, 2023)

Predicted Models: L 30% Low (inductive)

O - Bat Roost (Non-Cave) *(Bat Roost (Non-Cave))* IAH

4 Not Assessed

View in Field Guide

Important Animal Habitat - Native Species Global: **GNR** State: **SNR**

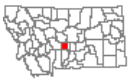
Delineation Criteria Confirmed area of occupancy based on the documented presence of adults or juveniles of any bat species at non-cave natural roost sites (e.g. rock outcrops, trees), below ground human created roost sites (e.g. mines), and above ground human created roost sites (e.g., bridges, buildings). Point observation locations are buffered by a distance of 4,500 meters in order to encompass the 95% confidence interval for nightly foraging distance reported for Townsendâ€™s Big-eared Bat (a resident Montana bat Species of Concern) and otherwise by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Oct 22, 2019)

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Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
N Suitable (native range)	C Common	Y Native / Year-round	Count of obs with 'good precision' (<=1000m)
O Optimal Suitability	O Occasional	S Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
M Moderate Suitability		W Winter	
L Low Suitability		M Migratory	
I Suitable (introduced range)		N Non-native	
		H Historical	



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46.40297	-109.79976
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Native Species

Summarized by: **008N015E027** *(Buffered PLSS Section)*
Filtered by:
Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC

Other Observed Species

	USFWS Sec7	# Obs	Predicted Model	Range
B - Great Blue Heron *(Ardea herodias)* SOC		11		Y S M
B - American White Pelican *(Pelecanus erythrorhynchos)* SOC		2		S M
B - Golden Eagle *(Aquila chrysaetos)* SOC		1		Y
B - Brewer's Sparrow *(Spizella breweri)* SOC		1		S M
B - Black-necked Stilt *(Himantopus mexicanus)* SOC		1		S M
B - Black Tern *(Chlidonias niger)* SOC		1		S M
B - Forster's Tern *(Sterna forsteri)* SOC		1		S M
I - Enallagma praevarum *(Arroyo Bluet)* PSOC		1	Not Assessed	Y
I - Rhionaeschna multicolor *(Blue-eyed Darner)* PSOC		1	Not Assessed	Y
B - Franklin's Gull *(Leucophaeus pipixcan)* SOC		2	Not Assessed	S M
B - Caspian Tern *(Hydroprogne caspia)* SOC		1	Not Assessed	M
F - Brook Stickleback *(Culaea inconstans)* PSOC		1	Not Assessed	

B - Great Blue Heron *(Ardea herodias)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3**
Predicted Models: O 15% Optimal (inductive), M 21% Moderate (inductive), L 26% Low (inductive)

B - American White Pelican *(Pelecanus erythrorhynchos)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: M 49% Moderate (inductive), L 51% Low (inductive)

B - Golden Eagle *(Aquila chrysaetos)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **BGEPA; MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: L 65% Low (inductive)

B - Brewer's Sparrow *(Spizella breweri)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 65% Low (inductive)

B - Black-necked Stilt *(Himantopus mexicanus)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: L 15% Low (inductive)

B - Black Tern *(Chlidonias niger)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 4% Low (inductive)

B - Forster's Tern *(Sterna forsteri)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 4% Low (inductive)

I - Enallagma praevarum *(Arroyo Bluet)* PSOC

View in Field Guide | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**

I - Rhionaeschna multicolor *(Blue-eyed Darner)* PSOC

View in Field Guide | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**

B - Franklin's Gull *(Leucophaeus pipixcan)* SOC

View in Field Guide | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

B - Caspian Tern *(Hydroprogne caspia)* SOC

View in Field Guide | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**

F - Brook Stickleback *(Culaea inconstans)* PSOC

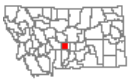
View in Field Guide
Potential Species of Concern - Native/Non-native Species - (depends on location or taxa) Global: **G5** State: **S4**

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Summarized by: **008N015E027** *(Buffered PLSS Section)*
Filtered by:
Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC

Other Potential Species

	USFWS Sec7	Predicted Model	Range
I - Danaus plexippus *(Monarch)* SOC			S
B - Eastern Screech-Owl *(Megascops asio)* PSOC			Y
M - Merriam's Shrew *(Sorex merriami)* SOC			Y
V - Carex crawei *(Crawe's Sedge)* SOC			Y
M - North American Porcupine *(Erethizon dorsatum)* PSOC			Y
B - Yellow-billed Cuckoo *(Coccyzus americanus)* SOC			S M
M - Western Spotted Skunk *(Spilogale gracilis)* PSOC			Y
M - Eastern Red Bat *(Lasiurus borealis)* SOC			S M
B - Eastern Bluebird *(Sialia sialis)* PSOC			S M
M - Dwarf Shrew *(Sorex nanus)* SOC			Y
V - Dichanthelium acuminatum *(Panic Grass)* SOC			Y
V - Potentilla plattensis *(Platte Cinquefoil)* SOC			Y

I - Danaus plexippus *(Monarch)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2S3** USFWS: **C** USFS: **Sensitive - Migratory in Forests (BD, BRT, KOOT)**
Predicted Models: O 11% Optimal (inductive), M 51% Moderate (inductive), L 38% Low (inductive)

B - Eastern Screech-Owl *(Megascops asio)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4** USFWS: **MBTA** PIF: **3**
Predicted Models: O 11% Optimal (inductive), M 43% Moderate (inductive), L 18% Low (inductive)

M - Merriam's Shrew *(Sorex merriami)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** FWP SWAP: **SGCN3**
Predicted Models: M 100% Moderate (inductive)

V - Carex crawei *(Crawe's Sedge)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2S3** Plant Threat Score: **Low**
Predicted Models: M 61% Moderate (inductive), L 39% Low (inductive)

M - North American Porcupine *(Erethizon dorsatum)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4** FWP SWAP: **SGIN**
Predicted Models: M 51% Moderate (inductive), L 49% Low (inductive)

B - Yellow-billed Cuckoo *(Coccyzus americanus)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **PS: LT; MBTA** BLM: **THREATENED** FWP SWAP: **SGCN3, SGIN** PIF: **2**
Predicted Models: M 51% Moderate (inductive), L 42% Low (inductive)

M - Western Spotted Skunk *(Spilogale gracilis)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **SU** FWP SWAP: **SGIN**
Predicted Models: M 48% Moderate (inductive), L 15% Low (inductive)

M - Eastern Red Bat *(Lasiurus borealis)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G3G4** State: **S3B** BLM: **SENSITIVE**
Predicted Models: M 41% Moderate (inductive), L 47% Low (inductive)

B - Eastern Bluebird *(Sialia sialis)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA**
Predicted Models: M 39% Moderate (inductive), L 53% Low (inductive)

M - Dwarf Shrew *(Sorex nanus)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2S3** FWP SWAP: **SGCN2-3**
Predicted Models: M 30% Moderate (inductive), L 70% Low (inductive)

V - Dichanthelium acuminatum *(Panic Grass)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2S3** Plant Threat Score: **Unknown**
Predicted Models: M 30% Moderate (inductive), L 38% Low (inductive)

V - Potentilla plattensis *(Platte Cinquefoil)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** Plant Threat Score: **No Known Threats** CCVI: **Highly Vulnerable**
Predicted Models: M 26% Moderate (inductive), L 31% Low (inductive)

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View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Sensitive - Known in Forests (BD, LOLO)** **Species of Conservation Concern in Forests (CG, HLC)** Plant Threat Score: **Low** CCVI: **Highly Vulnerable**
Predicted Models: M 25% Moderate (inductive), L 24% Low (inductive)

M - Little Brown Myotis *(Myotis lucifugus)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G3G4** State: **S3** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT)** FWP SWAP: **SGCN3**
Predicted Models: M 24% Moderate (inductive), L 71% Low (inductive)

B - Barrow's Goldeneye *(Bucephala islandica)* **PSOC**

View in Field Guide View Predicted Models View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **2**
Predicted Models: M 21% Moderate (inductive), L 35% Low (inductive)

M - Spotted Bat *(Euderma maculatum)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN**
Predicted Models: M 15% Moderate (inductive), L 54% Low (inductive)

I - Bombus suckleyi *(Suckley Cuckoo Bumble Bee)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G2G3** State: **S1**
Predicted Models: M 15% Moderate (inductive), L 28% Low (inductive)

B - Short-eared Owl *(Asio flammeus)* **PSOC**

View in Field Guide View Predicted Models View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA; BCC11; BCC17** PIF: **3**
Predicted Models: M 11% Moderate (inductive), L 73% Low (inductive)

R - Western Milksnake *(Lampropeltis gentilis)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** BLM: **SENSITIVE** FWP SWAP: **SGCN2**
Predicted Models: M 11% Moderate (inductive), L 51% Low (inductive)

B - White-faced Ibis *(Plegadis chihi)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: M 11% Moderate (inductive), L 43% Low (inductive)

B - Chimney Swift *(Chaetura pelagica)* **PSOC**

View in Field Guide View Predicted Models View Range Maps
Potential Species of Concern - Native Species Global: **G4G5** State: **S3S4B** USFWS: **MBTA; BCC11** FWP SWAP: **SGIN** PIF: **3**
Predicted Models: M 11% Moderate (inductive), L 40% Low (inductive)

B - Rufous Hummingbird *(Selasphorus rufus)* **PSOC**

View in Field Guide View Predicted Models View Range Maps
Potential Species of Concern - Native Species Global: **G4** State: **S4B** USFWS: **MBTA; BCC10** PIF: **3**
Predicted Models: M 11% Moderate (inductive), L 39% Low (inductive)

B - Cassin's Finch *(Haemorhous cassinii)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: M 11% Moderate (inductive), L 30% Low (inductive)

B - Sage Thrasher *(Oreoscoptes montanus)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: M 7% Moderate (inductive), L 72% Low (inductive)

M - Long-eared Myotis *(Myotis evotis)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3**
Predicted Models: M 6% Moderate (inductive), L 89% Low (inductive)

M - Fringed Myotis *(Myotis thysanodes)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: M 6% Moderate (inductive), L 82% Low (inductive)

V - Cyperus schweinitzii *(Schweinitz's Flatsedge)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** Plant Threat Score: **Low**
Predicted Models: M 6% Moderate (inductive), L 56% Low (inductive)

B - Pinyon Jay *(Gymnorhinus cyanocephalus)* **SOC**

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G3** State: **S3** USFWS: **MBTA; BCC10; BCC17** FWP SWAP: **SGCN3**
Predicted Models: M 5% Moderate (inductive), L 95% Low (inductive)

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View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3** FWP SWAP: **SGCN3**
Predicted Models: M 5% Moderate (inductive), L 13% Low (inductive)

M - Silver-haired Bat *(Lasionycteris noctivagans)* **PSOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Potential Species of Concern - Native Species Global: **G3G4** State: **S4**
Predicted Models: M 4% Moderate (inductive), L 91% Low (inductive)

V - Stellaria crassifolia *(Fleshy Stitchwort)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S2** Plant Threat Score: **No Known Threats**
Predicted Models: M 4% Moderate (inductive), L 76% Low (inductive)

M - Townsend's Big-eared Bat *(Corynorhinus townsendii)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known in Forests (LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: M 4% Moderate (inductive), L 49% Low (inductive)

R - Spiny Softshell *(Apalone spinifera)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: M 4% Moderate (inductive), L 43% Low (inductive)

B - American Bittern *(Botaurus lentiginosus)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: M 4% Moderate (inductive), L 11% Low (inductive)

M - Hayden's Shrew *(Sorex haydeni)* **PSOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S3S4**
Predicted Models: L 100% Low (inductive)

B - Sharp-tailed Grouse *(Tympanuchus phasianellus)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **SX,S4** FWP SWAP: **SGCN1** PIF: **2**
Predicted Models: L 100% Low (inductive)

V - Elodea bifoliata *(Long-sheath Waterweed)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4G5** State: **S2?** Plant Threat Score: **No Known Threats**
Predicted Models: L 100% Low (inductive)

B - Sprague's Pipit *(Anthus spragueii)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G3G4** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Predicted Models: L 100% Low (inductive)

B - Common Poorwill *(Phalaenoptilus nuttallii)* **PSOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**
Predicted Models: L 95% Low (inductive)

M - Black-tailed Prairie Dog *(Cynomys ludovicianus)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: L 79% Low (inductive)

B - Greater Sage-Grouse *(Centrocercus urophasianus)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G3G4** State: **S2** USFS: **Sensitive - Known in Forests (BD)** **Species of Conservation Concern in Forests (CG)** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **1**
Predicted Models: L 68% Low (inductive)

M - Long-legged Myotis *(Myotis volans)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4G5** State: **S3**
Predicted Models: L 62% Low (inductive)

V - Cypripedium parviflorum *(Small Yellow Lady's-slipper)* **PSOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S3S4** USFS: **Sensitive - Known in Forests (LOLO)** **Species of Conservation Concern in Forests (CG, HLC)**
Predicted Models: L 62% Low (inductive)

B - Clark's Nutcracker *(Nucifraga columbiana)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** USFS: **Species of Conservation Concern in Forests (FLAT)** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: L 58% Low (inductive)

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View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G3** State: **S3** Plant Threat Score: **No Known Threats** CCVI: **Extremely Vulnerable**
Predicted Models: L 58% Low (inductive)

B - Loggerhead Shrike *(Lanius ludovicianus)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 56% Low (inductive)

B - Burrowing Owl *(Athene cunicularia)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Predicted Models: L 51% Low (inductive)

B - Ovenbird *(Seiurus aurocapilla)* **PSOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** PIF: **3**
Predicted Models: L 51% Low (inductive)

B - Black-billed Cuckoo *(Coccyzus erythropthalmus)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN** PIF: **2**
Predicted Models: L 47% Low (inductive)

A - Northern Leopard Frog *(Lithobates pipiens)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S1,S4** USFS: **Sensitive - Suspected in Forests (KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN1**
Predicted Models: L 36% Low (inductive)

B - Plumbeous Vireo *(Vireo plumbeus)* **PSOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S3S4B** USFWS: **MBTA** PIF: **3**
Predicted Models: L 36% Low (inductive)

B - Black-crowned Night-Heron *(Nycticorax nycticorax)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: L 32% Low (inductive)

V - Chenopodium subglabrum *(Smooth Goosefoot)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G3G4** State: **S2** Plant Threat Score: **Unknown** CCVI: **Highly Vulnerable**
Predicted Models: L 30% Low (inductive)

B - Lewis's Woodpecker *(Melanerpes lewis)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S2B** USFWS: **MBTA; BCC10; BCC17** USFS: **Species of Conservation Concern in Forests (HLC)**
BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**
Predicted Models: L 27% Low (inductive)

I - Oreohelix strigosa berryi *(Berry's Mountainsnail)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5T2** State: **S1S2**
Predicted Models: L 26% Low (inductive)

B - Common Tern *(Sterna hirundo)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 25% Low (inductive)

V - Physaria ludoviciana *(Silver Bladderpod)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S2S3** Plant Threat Score: **No Known Threats**
Predicted Models: L 24% Low (inductive)

V - Lobelia kalmii *(Kalm's Lobelia)* **SOC**

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** Plant Threat Score: **No Known Threats**
Predicted Models: L 21% Low (inductive)

M - Grizzly Bear *(Ursus arctos)* **SOC**

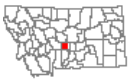
View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S2S3** USFWS: **LT** BLM: **THREATENED** FWP SWAP: **SGCN2-3**
Predicted Models: L 19% Low (inductive)

M - Canada Lynx *(Lynx canadensis)* **SOC**

View in Field Guide **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **LT; CH** BLM: **THREATENED** FWP SWAP: **SGCN3**

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46.40297	-109.79976
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Structured Surveys

Summarized by: **008N015E027** *(Buffered PLSS Section)*

The Montana Natural Heritage Program (MTNHP) records information on the locations where more than 80 different types of well-defined repeatable survey protocols capable of detecting an animal species or suite of animal species have been conducted by state, federal, tribal, university, or private consulting biologists. Examples of structured survey protocols tracked by MTNHP include: visual encounter and dip net surveys for pond breeding amphibians, point counts for birds, call playback surveys for selected bird species, visual surveys of migrating raptors, kick net stream reach surveys for macroinvertebrates, visual encounter cover object surveys for terrestrial mollusks, bat acoustic or mist net surveys, pitfall and/or snap trap surveys for small terrestrial mammals, track or camera trap surveys for large mammals, and trap surveys for turtles. Whenever possible, photographs of survey locations are stored in MTNHP databases.

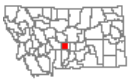
MTNHP does not typically manage information on structured surveys for plants; surveys for invasive species may be a future exception.

Within the report area you have requested, structured surveys are summarized by the number of each type of structured survey protocol that has been conducted, the number of species detections/observations resulting from these surveys, and the most recent year a survey has been conducted.

A-Nocturnal Calling Amphibian *(Nocturnal Breeding Amphibian Calling Survey)*	**Survey Count**: 1	**Obs Count**: 1	**Recent Survey**: 1997
B-Cuckoo Playback Survey *(Riparian Playback Surveys for Cuckoos)*	**Survey Count**: 4	**Obs Count**:	**Recent Survey**: 2012
E-Eastern Heath Snail *(Eastern Heath Snail Survey)*	**Survey Count**: 3	**Obs Count**:	**Recent Survey**: 2012
E-Eurasian Water-milfoil Rake *(Rake tows/pulls for Eurasian Water-milfoil)*	**Survey Count**: 7	**Obs Count**: 4	**Recent Survey**: 2021
E-Invasive Mussel Plankton Tow *(Plankton tows for veligers of Invasive Mussels)*	**Survey Count**: 6	**Obs Count**:	**Recent Survey**: 2022
E-Kicknet *(Kicknet Collection Survey for Invasive Mussels and Snails)*	**Survey Count**: 7	**Obs Count**: 4	**Recent Survey**: 2022
E-Noxious Weed, Road-based *(Noxious Weed Road-based Visual Surveys)*	**Survey Count**: 9	**Obs Count**: 20	**Recent Survey**: 2005
E-Visual Aquatic Invasives *(Visual Encounter Surveys for Aquatic Invasives on Shorelines or Underwater)*	**Survey Count**: 8	**Obs Count**: 2	**Recent Survey**: 2022
F-Fish Electrofishing *(Fish Electrofishing Surveys)*	**Survey Count**: 2	**Obs Count**: 7	**Recent Survey**: 1994
F-Fish Trapping/Netting *(Fish Trapping or Netting Surveys)*	**Survey Count**: 3	**Obs Count**: 11	**Recent Survey**: 2020
I-Mosquito Traps *(Montana Mosquito Surveillance Project)*	**Survey Count**: 8	**Obs Count**: 42	**Recent Survey**: 2016
I-Mussel *(Stream Mussel Survey)*	**Survey Count**: 1	**Obs Count**:	**Recent Survey**: 2008
M-Bat Roost (Active Season) *(Bat Roost (Active Season) Survey)*	**Survey Count**: 5	**Obs Count**: 5	**Recent Survey**: 2019
P-Algal scraping *(Algal Scraping)*	**Survey Count**: 2	**Obs Count**: 101	**Recent Survey**: 2003

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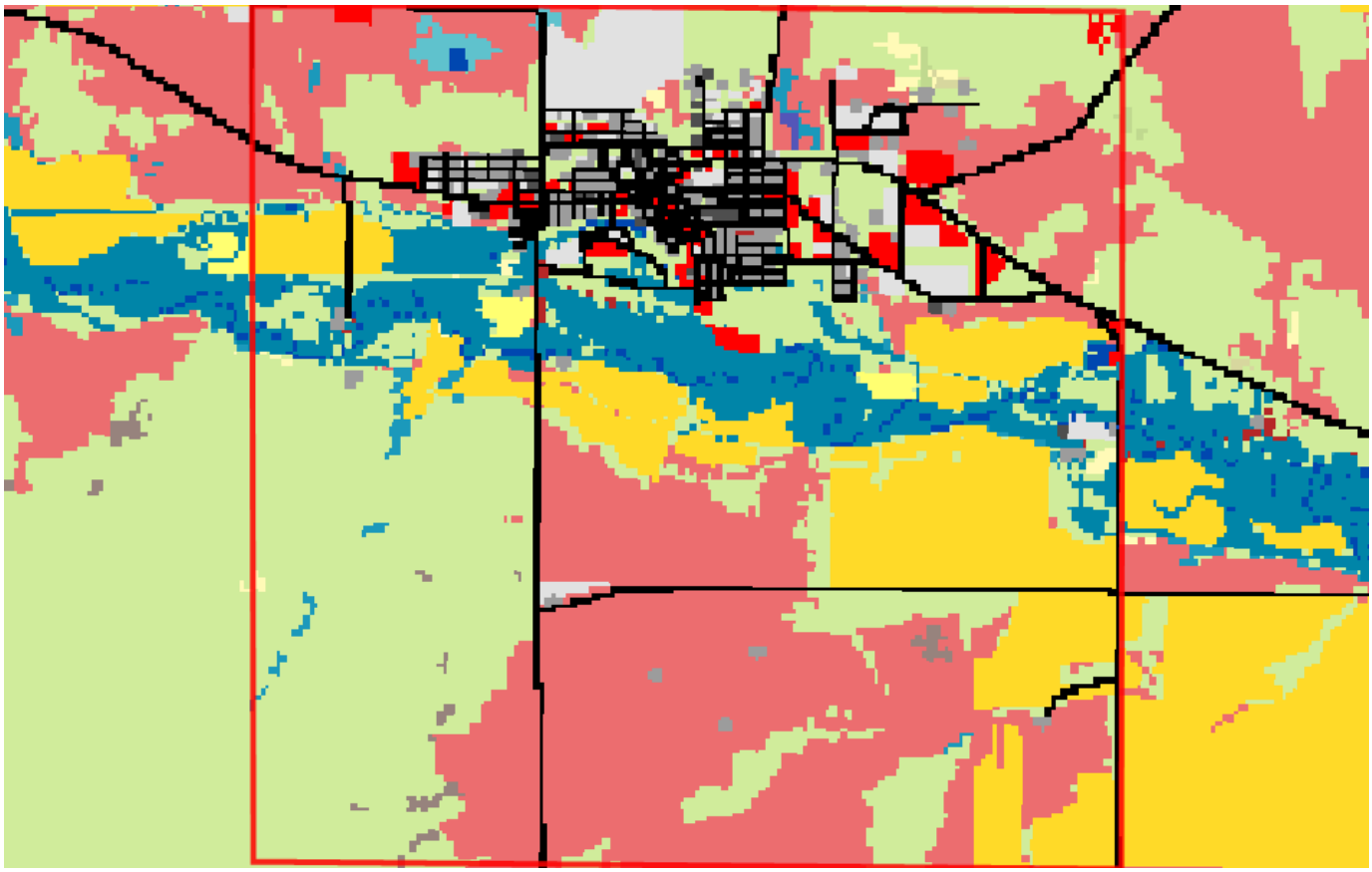
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Land Cover

Summarized by: **008N015E027** *(Buffered PLSS Section)*





33% (*1,866 Acres*)

Grassland Systems
Lowland/Prairie Grassland
Great Plains Mixedgrass Prairie

The system covers much of the eastern two-thirds of Montana, occurring continuously for hundreds of square kilometers, interrupted only by wetland/riparian areas or sand prairies. Soils are primarily fine and medium-textured. The growing season averages 115 days, ranging from 100 days on the Canadian border to 130 days on the Wyoming border. Climate is typical of mid-continental regions with long severe winters and hot summers. Grasses typically comprise the greatest canopy cover, and western wheatgrass (*Pascopyrum smithii*) is usually dominant. Other species include thickspike wheatgrass (*Elymus lanceolatus*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and needle and thread (*Hesperostipa comata*). Near the Canadian border in north-central Montana, this system grades into rough fescue (*Festuca campestris)* and Idaho fescue (*Festuca idahoensis*) grasslands. Remnants of shortbristle needle and thread *(Hesperostipa curtiseta)* dominated vegetation are found in northernmost Montana and North Dakota, and are associated with productive sites, now mostly converted to farmland. Forb diversity is typically high. In areas of southeastern and central Montana where sagebrush steppe borders the mixed grass prairie, common plant associations include Wyoming big sagebrush-western wheatgrass (*Artemisia tridentata* ssp. *wyomingensis/ Pascopyrum smithii*). Fire and grazing are the primary drivers of this system. Drought can also impact it, in general favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and Japanese brome (*Bromus japonicus*) increase in dominance; both of these rhizomatous species have been shown to markedly decrease species diversity. Previously cultivated acres that have been re-vegetated with non-native plants have been transformed into associations such as Kentucky bluegrass (*Poa pratensis*)/western wheatgrass *(Pascopyrum smithii)* or into pure crested wheatgrass (*Agropyron cristatum)* stands.



29% (*1,683 Acres*)

Recently Disturbed or Modified
Introduced Vegetation
Introduced Upland Vegetation - Annual and Biennial Forbland

Land cover is significantly altered/disturbed by introduced annual and biennial forbs. Natural vegetation types are no longer recognizable. Typical species that dominate these areas are knapweed, oxeye daisy, Canada thistle, leafy spurge, pepperweed, and yellow sweetclover.



13% (*745 Acres*)

Human Land Use
Agriculture
Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.

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7% (*421 Acres*)

Floodplain and Riparian

Great Plains Floodplain

This system occurs along the Missouri and Yellowstone Rivers and their larger tributaries, including parts of the Little Missouri, Clarkâ€™s Fork Yellowstone, Powder, Tongue, Bighorn, Milk, and Musselshell rivers. These are the big perennial rivers of the region, with hydrologic dynamics largely driven by snowmelt and rainfall originating in their headwater watersheds, rather than local precipitation events. In the absence of disturbance, periodic flooding of fluvial and alluvial soils and channel migration will create depressions and backwaters that support a mosaic of wetland and riparian vegetation, whose composition and structure is sustained, altered and redistributed by hydrology. Dominant communities within this system range from floodplain forests to wet meadows to gravel/sand flats, linked by underlying soils and flooding regimes. In the western part of the systemâ€™s range in Montana, the overstory dominant species is black cottonwood (*Populus balsamifera ssp. trichocarpa*) with narrowleaf cottonwood *(Populus angustifolia)* and eastern cottonwood (*Populus deltoides)* occurring as co-dominants in the riparian/floodplain interface near the mountains. Further east, narrowleaf cottonwood and Plains cottonwood become dominant. In relatively undisturbed stands, willow (*Salix* species), redosier dogwood (*Cornus sericea*) and common chokecherry (*Prunus virginiana*) form a thick, multi-layered shrub understory, with a mixture of cool and warm season graminoid species below.

In Montana, many occurrences are now degraded to the point where the cottonwood overstory is the only remaining natural component. The hydrology of these floodplain systems has been affected by dams, highways, railroads and agricultural ditches, and as a result, they have lost their characteristic wetland /riparian mosaic structure. This has resulted in a highly altered community consisting of relict cottonwood stands with little regeneration. The understory vegetation is dominated by non-native pasture grasses, legumes and other introduced forbs, or by the disclimax western snowberry (*Symphoricarpos occidentalis*) and rose (*Rosa* species) shrub community.

No Image

6% (*323 Acres*)

Human Land Use

Developed

Other Roads

County, city and or rural roads generally open to motor vehicles.



3% (*181 Acres*)

Human Land Use

Developed

Developed, Open Space

Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20% of total cover. This category often includes highway and railway rights of way and graveled rural roads.



2% (*125 Acres*)

Human Land Use

Developed

Low Intensity Residential

Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-50% of total cover. These areas most commonly include single-family housing units in rural and suburban areas. Paved roadways may be classified into this category.

No Image

2% (*98 Acres*)

Human Land Use

Developed

Commercial / Industrial

Businesses, industrial parks, hospitals, airports; utilities in commercial/industrial areas.

Additional Limited Land Cover

1% (*85 Acres*) Major Roads

1% (*43 Acres*) Open Water

1% (*38 Acres*) Great Plains Riparian

<1% (*24 Acres*) Pasture/Hay

<1% (*22 Acres*) Big Sagebrush Steppe

<1% (*21 Acres*) Great Plains Saline Depression Wetland

<1% (*20 Acres*) Great Plains Cliff and Outcrop

<1% (*15 Acres*) High Intensity Residential

<1% (*5 Acres*) Introduced Riparian and Wetland Vegetation

<1% (*3 Acres*) Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland

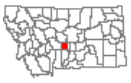
<1% (*2 Acres*) Great Plains Shrubland

<1% (*2 Acres*) Great Plains Sand Prairie

<1% (*0 Acres*) Great Plains Closed Depressional Wetland

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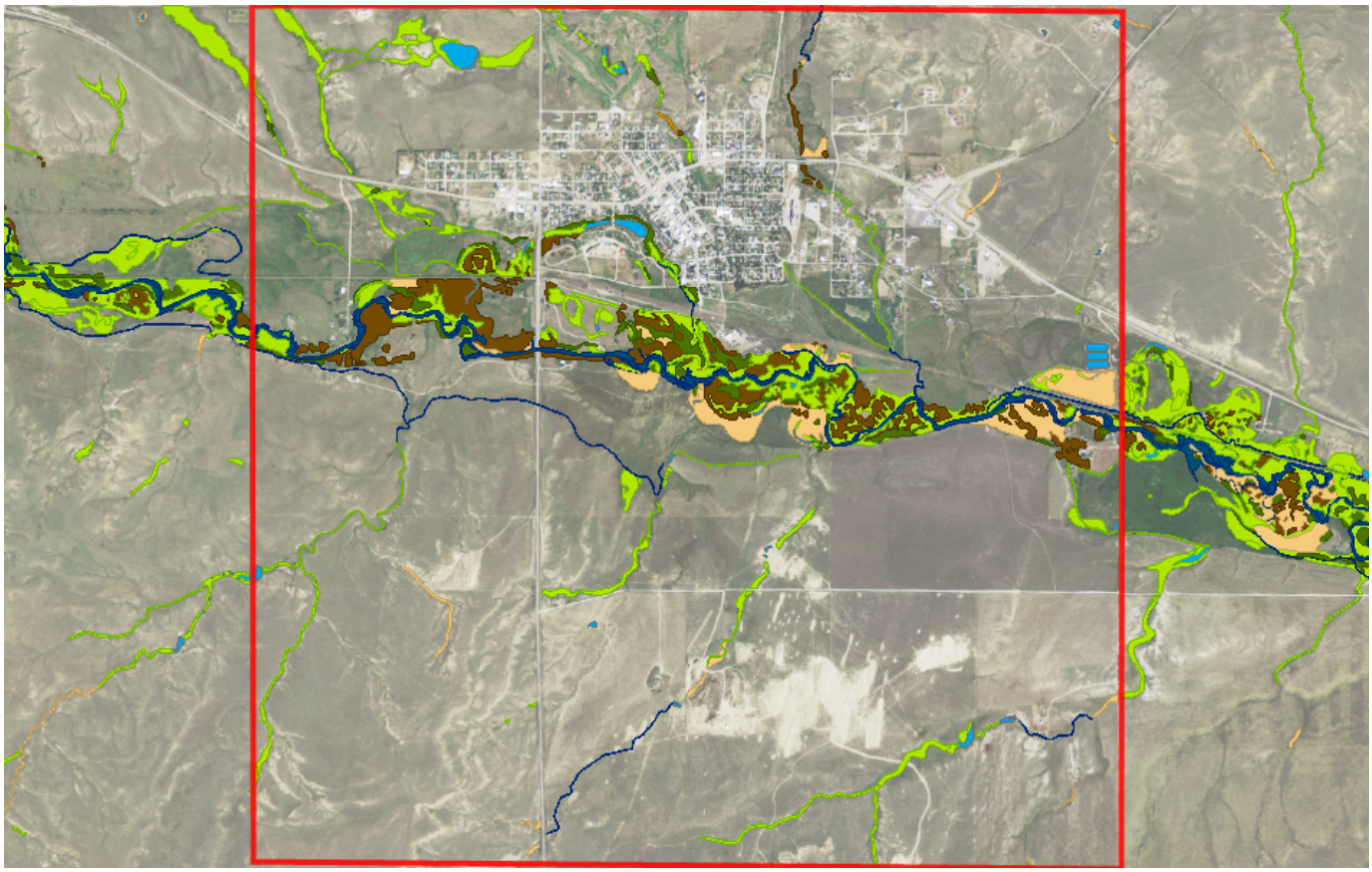
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Wetland and Riparian

Summarized by: **008N015E027** *(Buffered PLSS Section)*



Wetland and Riparian Mapping

P - Palustrine

AB - Aquatic Bed

P - Palustrine, AB - Aquatic Bed
Wetlands with vegetation growing on or below the water surface for most of the growing season.

F - Semipermanently Flooded	15 Acres	
(no modifier)	**8 Acres**	**PABF**
h - Diked/Impounded	**6 Acres**	**PABFh**
x - Excavated	**1 Acres**	**PABFx**
K - Artificially Flooded	4 Acres	
x - Excavated	**4 Acres**	**PABKx**

US - Unconsolidated Shore

P - Palustrine, US - Unconsolidated Shore
Wetlands with less than 75% areal cover of stones, boulders, or bedrock. AND with less than 30% vegetative cover AND the wetland is irregularly exposed due to seasonal or irregular flooding and subsequent drying.

A - Temporarily Flooded	<1 Acres	
(no modifier)	**<1 Acres**	**PUSA**
h - Diked/Impounded	**<1 Acres**	**PUSAh**
x - Excavated	**<1 Acres**	**PUSAx**
C - Seasonally Flooded	1 Acres	
(no modifier)	**<1 Acres**	**PUSC**
h - Diked/Impounded	**1 Acres**	**PUSCh**
x - Excavated	**<1 Acres**	**PUSCx**

EM - Emergent

P - Palustrine, EM - Emergent
Wetlands with erect, rooted herbaceous vegetation present during most of the growing season.

A - Temporarily Flooded	141 Acres	
(no modifier)	**134 Acres**	**PEMA**
h - Diked/Impounded	**1 Acres**	**PEMAh**
x - Excavated	**6 Acres**	**PEMAx**
C - Seasonally Flooded	22 Acres	
(no modifier)	**21 Acres**	**PEMC**
x - Excavated	**1 Acres**	**PEMCx**
F - Semipermanently Flooded	8 Acres	
(no modifier)	**6 Acres**	**PEMF**
h - Diked/Impounded	**1 Acres**	**PEMFh**
x - Excavated	**1 Acres**	**PEMFx**

SS - Scrub-Shrub

P - Palustrine, SS - Scrub-Shrub
Wetlands dominated by woody vegetation less than 6 meters

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(20 feet) tall. *Woody vegetation includes tree saplings and*
stunted due to environmental conditions.

(no modifier)	**39 Acres** PSSA
h - Diked/Impounded	**1 Acres** PSSAh
C - Seasonally Flooded	<1 Acres
(no modifier)	**<1 Acres** PSSC

R - Riverine (Rivers)

3 - Upper Perennial

UB - Unconsolidated Bottom

R - Riverine (Rivers), 3 - Upper Perennial, UB - Unconsolidated Bottom
Stream channels where the substrate is at least 25% mud, silt or other fine particles.

F - Semipermanently Flooded	1 Acres
(no modifier)	**1 Acres** R3UBF
H - Permanently Flooded	33 Acres
(no modifier)	**33 Acres** R3UBH

US - Unconsolidated Shore

R - Riverine (Rivers), 3 - Upper Perennial, US - Unconsolidated Shore
Shorelines with less than 75% areal cover of stones, boulders, or bedrock and less than 30% vegetation cover. The area is also irregularly exposed due to seasonal or irregular flooding and subsequent drying.

A - Temporarily Flooded	12 Acres
(no modifier)	**12 Acres** R3USA
C - Seasonally Flooded	1 Acres
(no modifier)	**1 Acres** R3USC

4 - Intermittent

SB - Stream Bed

R - Riverine (Rivers), 4 - Intermittent, SB - Stream Bed
Active channel that contains periodic water flow.

A - Temporarily Flooded	4 Acres
(no modifier)	**3 Acres** R4SBA
x - Excavated	**1 Acres** R4SBAx
C - Seasonally Flooded	5 Acres
(no modifier)	**1 Acres** R4SBC
x - Excavated	**4 Acres** R4SBCx

Rp - Riparian

1 - Lotic

SS - Scrub-Shrub
(no modifier) **1 Acres** Rp1SS

Rp - Riparian, 1 - Lotic, SS - Scrub-Shrub
This type of riparian area is dominated by woody vegetation that is less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.

FO - Forested
(no modifier) **115 Acres** Rp1FO

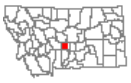
Rp - Riparian, 1 - Lotic, FO - Forested
This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.

EM - Emergent
(no modifier) **72 Acres** Rp1EM

Rp - Riparian, 1 - Lotic, EM - Emergent
Riparian areas that have erect, rooted herbaceous vegetation during most of the growing season.

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Land Management

Summarized by: **008N015E027** *(Buffered PLSS Section)*

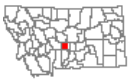


Land Management Summary

	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
Public Lands	**453 Acres (8%)**			
Federal	5 Acres (<1%)			
US Department of Defense	5 Acres (<1%)			
USDOD Owned	5 Acres (<1%)			
State	6 Acres (<1%)			
Montana Department of Transportation	6 Acres (<1%)			
MTDOT Owned	6 Acres (<1%)			
Local	442 Acres (8%)			
Local Government	442 Acres (8%)			
Local Government Owned	442 Acres (8%)			
Private Lands or Unknown Ownership	**5,272 Acres (92%)**			

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Biological Reports

Summarized by: **008N015E027** *(Buffered PLSS Section)*

Within the report area you have requested, citations for all reports and publications associated with plant or animal observations in Montana Natural Heritage Program (MTNHP) databases are listed and, where possible, links to the documents are included.

The MTNHP plans to include reports associated with terrestrial and aquatic communities in the future as allowed for by staff resources. If you know of reports or publications associated with species or biological communities within the report area that are not shown in this report, please let us know: mtnhp@mt.gov

No Biological Reports were found in the selected area

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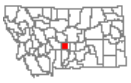
Legend

Model Icons
- N Suitable (native range)
- O Optimal Suitability
- M Moderate Suitability
- L Low Suitability
- I Suitable (introduced range)

Habitat Icons
- C Common
- O Occasional

Range Icons
- N Non-native

Num Obs
Count of obs with 'good precision' (<=1000m)
+ indicates additional 'poor precision' obs (1001m-10,000m)



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Invasive and Pest Species

Summarized by: **008N015E027** *(Buffered PLSS Section)*

	# Obs	Predicted Model	Range
Aquatic Invasive Species			
V - Potamogeton crispus *(Curly-leaf Pondweed)* **N2B/AIS**	3		N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 2B - Aquatic Invasive Species - Non-native Species Global: **G5** State: **SNA**			
Predicted Models: L 82% Low (inductive)			
V - Myriophyllum spicatum *(Eurasian Water-milfoil)* **N2A/AIS**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**			
Predicted Models: L 47% Low (inductive)			
V - Nymphaea odorata *(American Water-lily)* **AIS**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Aquatic Invasive Species - Non-native Species Global: **G5** State: **SNA**			
Predicted Models: I 95% Suitable (introduced range) (deductive)			
I - Faxonius virilis *(Virile Crayfish)* **AIS**	3	Not Assessed	
View in Field Guide			
Aquatic Invasive Species - Native/Non-native Species - (depends on location or taxa) Global: **G5** State: **S5**			
Noxious Weeds: Priority 1A			
V - Isatis tinctoria *(Dyer's Woad)* **N1A**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA**			
Predicted Models: O 22% Optimal (inductive), M 17% Moderate (inductive), L 53% Low (inductive)			
V - Centaurea solstitialis *(Yellow Starthistle)* **N1A**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA**			
Predicted Models: O 11% Optimal (inductive), M 25% Moderate (inductive), L 26% Low (inductive)			
V - Taeniatherum caput-medusae *(Medusahead)* **N1A**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1A - Non-native Species Global: **G4G5** State: **SNA**			
Predicted Models: L 69% Low (inductive)			
V - Phragmites australis ssp. australis *(European Common Reed)* **N1A**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1A - Non-native Species Global: **G5T5** State: **SNA**			
Predicted Models: L 30% Low (inductive)			
Noxious Weeds: Priority 1B			
V - Lythrum salicaria *(Purple Loosestrife)* **N1B**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1B - Non-native Species Global: **G5** State: **SNA**			
Predicted Models: O 22% Optimal (inductive), M 28% Moderate (inductive), L 14% Low (inductive)			
V - Echium vulgare *(Blueweed)* **N1B**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1B - Non-native Species Global: **GNR** State: **SNA**			
Predicted Models: M 11% Moderate (inductive), L 49% Low (inductive)			
V - Polygonum cuspidatum *(Japanese Knotweed)* **N1B**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1B - Non-native Species Global: **GNRTNR** State: **SNA**			
Predicted Models: M 11% Moderate (inductive), L 39% Low (inductive)			
V - Cytisus scoparius *(Scotch Broom)* **N1B**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 1B - Non-native Species Global: **GNR** State: **SNA**			
Predicted Models: L 64% Low (inductive)			
Noxious Weeds: Priority 2A			
V - Rhamnus cathartica *(Common Buckthorn)* **N2A**			N
View in Field Guide **View Predicted Models** **View Range Maps**			
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**			
Predicted Models: O 45% Optimal (inductive), M 29% Moderate (inductive), L 12% Low (inductive)			

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View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 32% Moderate (inductive), L 49% Low (inductive)

V - Lepidium latifolium *(Perennial Pepperweed)* **N2A**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 11% Moderate (inductive), L 84% Low (inductive)

V - Hieracium praealtum *(Kingdevil Hawkweed)* **N2A**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 11% Moderate (inductive), L 62% Low (inductive)

V - Ranunculus acris *(Tall Buttercup)* **N2A**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: **G5** State: **SNA**
Predicted Models: L 73% Low (inductive)

V - Myriophyllum spicatum *(Eurasian Water-milfoil)* **N2A/AIS**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 47% Low (inductive)

V - Hieracium caespitosum *(Meadow Hawkweed)* **N2A**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 24% Low (inductive)

Noxious Weeds: Priority 2B

V - Lepidium draba *(Whitetop)* **N2B** 2

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 35% Optimal (inductive), M 40% Moderate (inductive), L 25% Low (inductive)

V - Linaria dalmatica *(Dalmatian Toadflax)* **N2B** 1

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **G5** State: **SNA**
Predicted Models: O 11% Optimal (inductive), M 53% Moderate (inductive), L 36% Low (inductive)

V - Centaurea stoebe *(Spotted Knapweed)* **N2B** 14

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 83% Moderate (inductive), L 17% Low (inductive)

V - Euphorbia virgata *(Leafy Spurge)* **N2B** 27

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 73% Moderate (inductive), L 27% Low (inductive)

V - Cynoglossum officinale *(Common Hound's-tongue)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 51% Moderate (inductive), L 49% Low (inductive)

V - Centaurea diffusa *(Diffuse Knapweed)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 51% Moderate (inductive), L 42% Low (inductive)

V - Cirsium arvense *(Canada Thistle)* **N2B** 4

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **G5** State: **SNA**
Predicted Models: M 45% Moderate (inductive), L 55% Low (inductive)

V - Convolvulus arvensis *(Field Bindweed)* **N2B** 8

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 30% Moderate (inductive), L 65% Low (inductive)

V - Linaria vulgaris *(Yellow Toadflax)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 21% Moderate (inductive), L 43% Low (inductive)

V - Tanacetum vulgare *(Common Tansy)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 11% Moderate (inductive), L 51% Low (inductive)

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Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 95% Low (inductive)

V - Acroptilon repens *(Russian Knapweed)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 83% Low (inductive)

V - Potamogeton crispus *(Curly-leaf Pondweed)* **N2B/AIS**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Aquatic Invasive Species - Non-native Species Global: **G5** State: **SNA**
Predicted Models: L 82% Low (inductive)

V - Berteroa incana *(Hoary False-alyssum)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 62% Low (inductive)

V - Leucanthemum vulgare *(Oxeye Daisy)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 49% Low (inductive)

V - Potentilla recta *(Sulphur Cinquefoil)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 41% Low (inductive)

V - Hypericum perforatum *(Common St. John's-wort)* **N2B**

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 26% Low (inductive)

Regulated Weeds: Priority 3

V - Elaeagnus angustifolia *(Russian Olive)* **R3**

View in Field Guide View Predicted Models View Range Maps
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 37% Moderate (inductive), L 38% Low (inductive)

V - Bromus tectorum *(Cheatgrass)* **R3**

View in Field Guide View Predicted Models View Range Maps
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 100% Low (inductive)

Biocontrol Species

I - Aphthona lacertosa *(Brown-legged Leafy Spurge Flea Beetle)* **BIOCNTRL**

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 87% Moderate (inductive), L 13% Low (inductive)

I - Oberea erythrocephala *(Red-headed Leafy Spurge Stem Borer)* **BIOCNTRL**

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 60% Moderate (inductive), L 35% Low (inductive)

I - Aphthona nigriscutis *(Black Dot Leafy Spurge Flea Beetle)* **BIOCNTRL**

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 47% Moderate (inductive), L 26% Low (inductive)

I - Mecinus janthiniformis *(Dalmatian Toadflax Stem-boring Weevil)* **BIOCNTRL**

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 11% Moderate (inductive), L 89% Low (inductive)

I - Cyphocleonus achates *(Knapweed Root Weevil)* **BIOCNTRL**

View in Field Guide View Predicted Models View Range Maps
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 11% Moderate (inductive), L 62% Low (inductive)

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Introduction to Montana Natural Heritage Program

PO Box 201800 • 1201 11th Avenue • Helena, MT 59620-1800 • fax 406.444.0266 • phone 406.444.3989 • mtnhp.org

Introduction

The Montana Natural Heritage Program (MTNHP) is Montana's source for reliable and objective information on Montana's native species and habitats, emphasizing those of conservation concern. MTNHP was created by the Montana legislature in 1983 as part of the Natural Resource Information System (NRIS) at the Montana State Library (MSL). MTNHP is "a program of information acquisition, storage, and retrieval for data relating to the flora, fauna, and biological community types of Montana" (MCA 90-15-102). MTNHP's activities are guided by statute as well as through ongoing interaction with, and feedback from, principal data source agencies such as Montana Fish, Wildlife, and Parks, the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Montana University System, the US Forest Service, and the US Bureau of Land Management. Since the first staff was hired in 1985, the Program has logged a long record of success, and developed into a highly respected, service-oriented program. MTNHP is widely recognized as one of the most advanced and effective of over 60 natural heritage programs that are distributed across North America.

Vision

Our vision is that public agencies, the private sector, the education sector, and the general public will trust and rely upon MTNHP as the source for information and expertise on Montana's species and habitats, especially those of conservation concern. We strive to provide easy access to our information to allow users to save time and money, speed environmental reviews, and make informed decisions.

Core Values

- We endeavor to be a single statewide source of accurate and up-to-date information on Montana's plants, animals, and aquatic and terrestrial biological communities.
- We actively listen to our data users and work responsively to meet their information and training needs.
- We strive to provide neutral, trusted, timely, and equitable service to all of our information users.
- We make every effort to be transparent to our data users in setting work priorities and providing data products.

Confidentiality

All information requests made to the Montana Natural Heritage Program are considered library records and are protected from disclosure by the Montana Library Records Confidentiality Act (MCA 22-1-11).

Information Managed

Information managed at the Montana Natural Heritage Program is botanical, zoological, and ecological information that describes the distribution (e.g., observations, structured surveys, range polygons, predicted habitat suitability models), conservation status (e.g., global and state conservation status ranks, including threats), and other supporting information (e.g., accounts and references) on the biology and ecology of species and biological communities.

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Data Use Terms and Conditions

- Montana Natural Heritage Program (MTNHP) products and services are based on biological data and the objective interpretation of those data by professional scientists. MTNHP does not advocate any particular philosophy of natural resource protection, management, development, or public policy.
- MTNHP has no natural resource management or regulatory authority. Products, statements, and services from MTNHP are intended to inform parties as to the state of scientific knowledge about certain natural resources, and to further develop that knowledge. The information is not intended as natural resource management guidelines or prescriptions or a determination of environmental impacts. MTNHP recommends consultation with appropriate state, federal, and tribal resource management agencies and authorities in the area where your project is located.
- Information on the status and spatial distribution of biological resources produced by MTNHP are intended to inform parties of the state-wide status, known occurrence, or the likelihood of the presence of those resources. **These products are not intended to substitute for field-collected data, nor are they intended to be the sole basis for natural resource management decisions.**
- MTNHP does not portray its data as exhaustive or comprehensive inventories of rare species or biological communities. **Field verification of the absence or presence of sensitive species and biological communities will always be an important obligation of users of our data.**
- MTNHP responds equally to all requests for products and services, regardless of the purpose or identity of the requester.
- Because MTNHP constantly updates and revises its databases with new data and information, products will become outdated over time. Interested parties are encouraged to obtain the most current information possible from MTNHP, rather than using older products. We add, review, update, and delete records on a daily basis. Consequently, we strongly advise that you update your MTNHP data sets at a minimum of every four months for most applications of our information.
- MTNHP data require a certain degree of biological expertise for proper analysis, interpretation, and application. Our staff is available to advise you on questions regarding the interpretation or appropriate use of the data that we provide. See Contact Information for MTNHP Staff
- The information provided to you by MTNHP may include sensitive data that if publicly released might jeopardize the welfare of threatened, endangered, or sensitive species or biological communities. This information is intended for distribution or use only within your department, agency, or business. Subcontractors may have access to the data during the course of any given project, but should not be given a copy for their use on subsequent, unrelated work.
- MTNHP data are made freely available. Duplication of hard-copy or digital MTNHP products with the intent to sell is prohibited without written consent by MTNHP. Should you be asked by individuals outside your organization for the type of data that we provide, please refer them to MTNHP.
- MTNHP and appropriate staff members should be appropriately acknowledged as an information source in any third-party product involving MTNHP data, reports, papers, publications, or in maps that incorporate MTNHP graphic elements.
- Sources of our data include museum specimens, published and unpublished scientific literature, field surveys by state and federal agencies and private contractors, and reports from knowledgeable individuals. MTNHP actively solicits and encourages additions, corrections and updates, new observations or collections, and comments on any of the data we provide.
- MTNHP staff and contractors do not enter or cross privately-owned lands without express permission from the landowner. However, the program cannot guarantee that information provided to us by others was obtained under adherence to this policy.

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Suggested Contacts for Natural Resource Management Agencies

As required by Montana statute (MCA 90-15), the Montana Natural Heritage Program works with state, federal, tribal, nongovernmental organizations, and private partners to ensure that the latest animal and plant distribution and status information is incorporated into our databases so that it can be used to inform a variety of permitting and planning processes and management decisions. We encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located and review the permitting overviews by the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation and the Index of Environmental Permits for Montana for guidelines relevant to your efforts. In particular, we encourage you to contact the Montana Department of Fish, Wildlife, and Parks for the latest data and management information regarding hunted and high-profile management species and to use the U.S. Fish and Wildlife Service's Information Planning and Consultation (IPAC) website regarding U.S. Endangered Species Act listed Threatened, Endangered, or Candidate species.

For your convenience, we have compiled a list of relevant agency contacts and links below:

Montana Fish, Wildlife, and Parks

Fish Species	Zachary Shattuck zshattuck@mt.gov (406) 444-1231 or Eric Roberts eroberts@mt.gov (406) 444-5334
American Bison Black-footed Ferret Black-tailed Prairie Dog Bald Eagle Golden Eagle Common Loon Least Tern Piping Plover Whooping Crane	Kristian Smucker KSmucker@mt.gov (406) 444-5209
Grizzly Bear Greater Sage Grouse Trumpeter Swan Big Game Upland Game Birds Furbearers	Brian Wakeling brian.wakeling@mt.gov (406) 444-3940
Managed Terrestrial Game Data	Cara Whalen– MFWP Data Analyst cara.whalen@mt.gov (406) 444-3759
Fisheries Data and Nongame Animal Data	Ryan Alger – MFWP Data Analyst ryan.alger@mt.gov (406) 444-5365
Wildlife and Fisheries Scientific Collector's Permits	https://fwp.mt.gov/buyandapply/commercialwildlifeandscientificpermits/scientific Kristina Smucker for Wildlife ksmucker@mt.gov (406) 444-5209 Dave Schmetterling for Fisheries dschmetterling@mt.gov (406) 542-5514
Fish and Wildlife Recommendations for Subdivision Development	Charlie Sperry csperry@mt.gov (406) 444-3888 See https://fwp.mt.gov/conservation/living-with-wildlife/subdivision-recommendations
Regional Contacts  	Region 1 (Kalispell) (406) 752-5501 fwprg12@mt.gov Region 2 (Missoula) (406) 542-5500 fwprg22@mt.gov Region 3 (Bozeman) (406) 577-7900 fwprg3@mt.gov Region 4 (Great Falls) (406) 454-5840 fwprg42@mt.gov Region 5 (Billings) (406) 247-2940 fwprg52@mt.gov Region 6 (Glasgow) (406) 228-3700 fwprg62@mt.gov Region 7 (Miles City) (406) 234-0900 fwprg72@mt.gov

Montana Department of Agriculture
General Contact Information: https://agr.mt.gov/About/Office-Locations/Office-Locations-and-Field-Offices
Noxious Weeds: https://agr.mt.gov/Noxious-Weeds

Montana Department of Environmental Quality
Permitting and Operator Assistance for all Environmental Permits: https://deq.mt.gov/Permitting

Montana Department of Natural Resources and Conservation
Overview of, and contacts for, licenses and permits for state lands, water, and forested lands: https://dnrc.mt.gov/Permits-Services

Stream Permitting (310 permits) and an overview of various water and stream related permits (e.g., Stream Protection Act 124, Federal Clean Water Act 404, Federal Rivers and Harbors Act Section 10, Short-term Water Quality Standard for Turbidity 318 Authorization, etc.).
https://dnrc.mt.gov/Licenses-and-Permits/Stream-Permitting

Wildfire Resources: https://dnrc.mt.gov/Forestry/Wildfire

Bureau of Land Management

Montana Field Office Contacts:



Billings	(406) 896-5013
Butte	(406) 533-7600
Dillon	(406) 683-8000
Glasgow	(406) 228-3750
Havre	(406) 262-2820
Lewistown	(406) 538-1900
Malta	(406) 654-5100
Miles City	(406) 233-2800
Missoula	(406) 329-3914

United States Army Corps of Engineers
Montana Regulatory Office for federal permits related to construction in water and wetlands
https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Montana/ (406) 441-1375

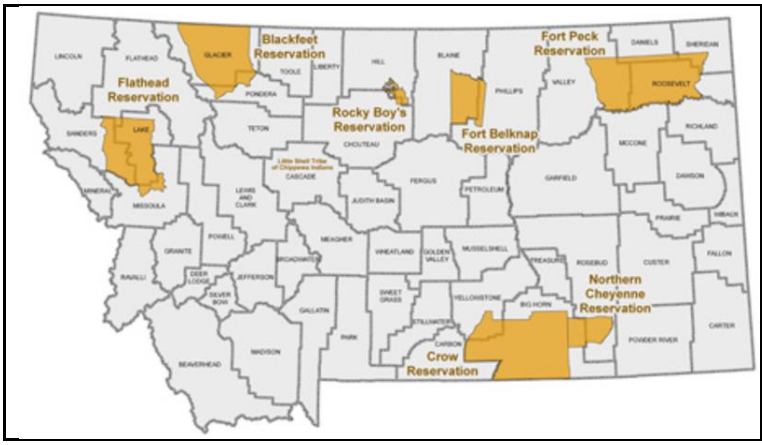
United States Environmental Protection Agency
Environmental information, notices, permitting, and contacts https://www.epa.gov/mt
Gateway to state resource locators https://www.envcap.org/srl/index.php

United States Fish and Wildlife Service
Information Planning and Conservation (IPAC) website: https://ipac.ecosphere.fws.gov
Montana Ecological Services Field Office: https://www.fws.gov/office/montana-ecological-services (406) 449-5225

United States Forest Service

Regional Office – Missoula, Montana Contacts			
Wildlife Program Leader	Tammy Fletcher	tammy.fletcher2@usda.gov	(406) 329-3086
Wildlife Ecologist	Cara Staab	cara.staab@usda.gov	(406) 329-3677
Aquatic Ecologist	Justin Jimenez	justin.jimenez@usda.gov	(435) 370-6830
TES Program	Lydia Allen	lydia.allen@usda.gov	(406) 329-3558
Interagency Grizzly Bear Coordinator	Scott Jackson	scott.jackson@usda.gov	(406) 329-3664
Regional Botanist	Amanda Hendrix	amanda.hendrix@usda.gov	(651) 447-3016
Regional Vegetation Ecologist	Mary Manning	marry.manning@usda.gov	(406) 329-3304
Invasive Species Program Manager	Michelle Cox	michelle.cox2@usda.gov	(406) 329-3669

Tribal Nations



[Assiniboine & Gros Ventre Tribes – Fort Belknap Reservation]

[Assiniboine & Sioux Tribes – Fort Peck Reservation]

[Blackfeet Tribe - Blackfeet Reservation]

[Chippewa Creek Tribe - Rocky Boy's Reservation]

[Crow Tribe – Crow Reservation]

[Little Shell Chippewa Tribe]

[Northern Cheyenne Tribe – Northern Cheyenne Reservation]

[Salish & Kootenai Tribes - Flathead Reservation]

Natural Heritage Programs and Conservation Data Centers in Surrounding States and Provinces

[Alberta Conservation Information Management System]
[British Columbia Conservation Data Centre]
[Idaho Natural Heritage Program]
[North Dakota Natural Heritage Program]
[Saskatchewan Conservation Data Centre]
[South Dakota Natural Heritage Program]
[Wyoming Natural Diversity Database]

Invasive Species Management Contacts and Information

Aquatic Invasive Species

[Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff]
[Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program]
[Montana Invasive Species Council (MISC)]
[Upper Columbia Conservation Commission (UC3)]

Noxious Weeds

[Montana Weed Control Association Contacts Webpage]
[Montana Biological Weed Control Coordination Project]
[Montana Department of Agriculture - Noxious Weeds]
[Montana Weed Control Association]
[Montana Fish, Wildlife, and Parks - Noxious Weeds]
[Montana State University Integrated Pest Management Extension]
[Integrated Noxious Weed Management after Wildfires]
[Fire Management and Invasive Plants]

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Introduction to Native Species

Within the report area you have requested, separate summaries are provided for: (1) Species Occurrences (SO) for plant and animal Species of Concern, Special Status Species (SSS), Important Animal Habitat (IAH) and some Potential Plant Species of Concern; (2) other observed non Species of Concern or Species of Concern without suitable documentation to create Species Occurrence polygons; and (3) other non-documented species that are potentially present based on their range, predicted suitable habitat model output, or presence of associated habitats. Each of these summaries provides the following information when present for a species: (1) the number of Species Occurrences and associated delineation criteria for construction of these polygons that have long been used for considerations of documented Species of Concern in environmental reviews; (2) the number of observations of each species; (3) the geographic range polygons for each species that the report area overlaps; (4) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (5) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (6) a variety of conservation status ranks and links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers below or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document native and introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are restricted by budgets, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species and biological communities will always be an important obligation of users of our data.**

If you are aware of observation datasets that the MTNHP is missing, please report them to the Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov If you have animal or plant observations that you would like to contribute, you can also submit them via Excel spreadsheets, geodatabases, iNaturalist, or a Survey123 form. Various methods of data submission are reviewed in this playlist of videos: https://www.youtube.com/playlist?list=PLRaydtZpHu2qOHPoSPq9cnM9uXGmEXACx

Observations

The MTNHP manages information on several million animal and plant observations that have been reported by professional biologists and private citizens from across Montana. The majority of these observations are submitted in digital format from standardized databases associated with research or monitoring efforts and spreadsheets of incidental observations submitted by professional biologists and amateur naturalists. At a minimum, accepted observation records must contain a credible species identification (i.e. appropriate geographic range, date, and habitat and, if species are difficult to identify, a photograph and/or notes on key identifying features), a date or date range, observer name, locational information (ideally with latitude and longitude in decimal degrees), notes on numbers observed, and species behavior or habitat use (e.g., is the observation likely associated with reproduction). Bird records are also required to have information associated with date-appropriate breeding or overwintering status of the species observed. MTNHP reviews observation records to ensure that they are mapped correctly, occur within date ranges when the species is known to be present or detectable, occur within the known seasonal geographic range of the species, and occur in appropriate habitats. MTNHP also assigns each record a locational uncertainty value in meters to indicate the spatial precision associated with the record's mapped coordinates. Only records with locational uncertainty values of 10,000 meters or less are included in environmental summary reports and number summaries are only provided for records with locational uncertainty values of 1,000 meters or less.

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Species Occurrences

The MTNHP evaluates plant and animal observation records for species of higher conservation concern to determine whether they are worthy of inclusion in the Species Occurrence (SO) layer for use in environmental reviews; observations not worthy of inclusion in this layer include long distance dispersal events, migrants observed away from key migratory stopover habitats, and winter observations. An SO is a polygon depicting what is known about a species occupancy from direct observation with a defined level of locational uncertainty and any inference that can be made about adjacent habitat use from the latest peer-reviewed science. If an observation can be associated with a map feature that can be tracked (e.g., a wetland boundary for a wetland associated plant) then this polygon feature is used to represent the SO. Areas that can be inferred as probable occupied habitat based on direct observation of a species location and what is known about the foraging area or home range size of the species may be incorporated into the SO. Species Occurrences generally belong to one of the following categories:

Plant Species Occurrences

A documented location of a specimen collection or observed plant population. In some instances, adjacent, spatially separated clusters are considered subpopulations and are grouped as one occurrence (e.g., the subpopulations occur in ecologically similar habitats, and their spatial proximity likely allows them to interbreed). Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Plant SO's are only created for Species of Concern and Potential Species of Concern.

Animal Species Occurrences

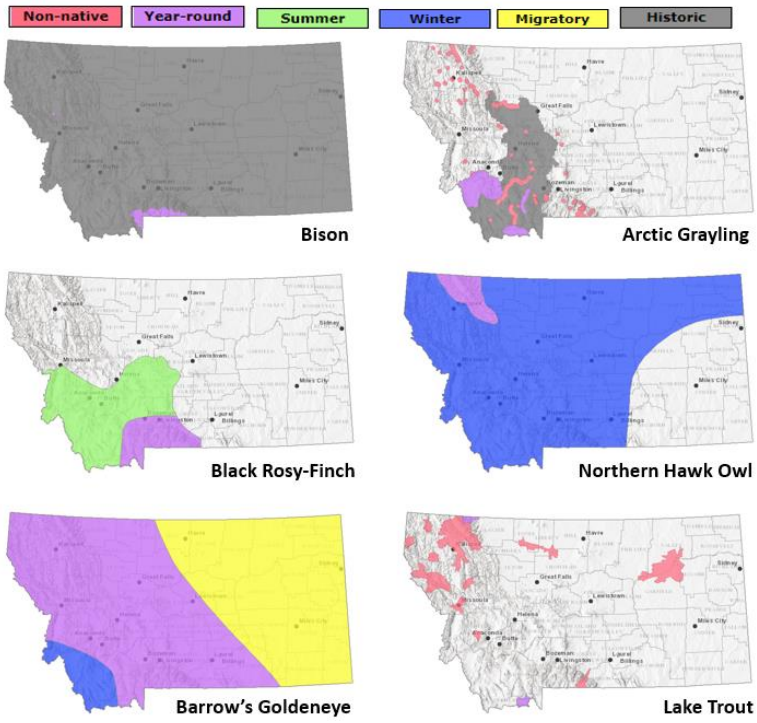
The location of a verified observation or specimen record typically known or assumed to represent a breeding population or a portion of a breeding population. Animal SO's are generally: (1) buffers of terrestrial point observations based on documented species' home range sizes; (2) buffers of stream segments to encompass occupied streams and immediate adjacent riparian habitats; (3) polygonal features encompassing known or likely breeding populations (e.g., a wetland for some amphibians or a forested portion of a mountain range for some wide-ranging carnivores); or (4) combinations of the above. Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Species Occurrence polygons may encompass some unsuitable habitat in some instances in order to avoid heavy data processing associated with clipping out habitats that are readily assessed as unsuitable by the data user (e.g., a point buffer of a terrestrial species may overlap into a portion of a lake that is obviously inappropriate habitat for the species). Animal SO's are only created for Species of Concern and Special Status Species (e.g., Bald Eagle).

Other Occurrence Polygons

These include significant biological features not included in the above categories, such as Important Animal Habitats like bird rookeries and bat roosts, and peatlands or other wetland and riparian communities that support diverse plant and animal communities.

Geographic Range Polygons

Geographic range polygons are still under development for most plant and invertebrate species. Native year-round, summer, winter, migratory and historic geographic range polygons as well as polygons for introduced populations have been defined for most vertebrate animal species for which there are enough observations, surveys, and knowledge of appropriate seasonal habitat use to define them (see examples to left). These native or introduced range polygons bound the extent of known or likely occupied habitats for non-migratory and relative sedentary species and the regular extent of known or likely occupied habitats for migratory and long-distance dispersing species; polygons may include unsuitable intervening habitats. For most species, a single polygon can represent the year-round or seasonal range, but breeding ranges of some colonial nesting water birds and some introduced species are represented more patchily when supported by data. Some ranges are mapped more broadly than actual distributions in order to be visible on statewide maps (e.g., fish).



Predicted Suitable Habitat Models

Predicted habitat suitability models have been created for plant and animal Species of Concern and are undergoing development for non-Species of Concern. For species for which models have been completed, the environmental summary report includes simple rule-based associations with streams for aquatic species and seasonal habitats for game species as well as mathematically complex Maximum Entropy models (Phillips et al. 2006, Ecological Modeling 190:231-259) constructed from a variety of statewide biotic and abiotic layers and presence only data for individual species for most terrestrial species. For the Maximum Entropy models, we reclassified 90 x 90-meter continuous model output into suitability classes (unsuitable, low, moderate, and optimal) then aggregated that into the one square mile hexagons used in the environmental summary report; this is the finest spatial scale we suggest using this information in management decisions and survey planning. Full model write ups for individual species that discuss model goals, inputs, outputs, and evaluation in much greater detail are posted on the MTNHP's Predicted Suitable Habitat Models webpage. Evaluations of predictive accuracy and specific limitations are included with the metadata for models of individual species. **Model outputs should not be used in place of on-the-ground surveys for species. Instead model outputs should be used in conjunction with habitat evaluations to determine the need for on-the-ground surveys for species.** We suggest that the percentage of predicted optimal and moderate suitable habitat within the report area be used in conjunction with geographic range polygons and the percentage of commonly associated habitats to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning.

Associated Habitats

Within the boundary of the intersected hexagons, we provide the approximate percentage of commonly or occasionally associated habitat for vertebrate animal species that regularly breed, overwinter, or migrate through the state; a detailed list of commonly and occasionally associated habitats is provided in individual species accounts in the Montana Field Guide We assigned common or occasional use of each of the ecological

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systems mapped in Montana by: (1) using personal knowledge and reviewing literature that summarizes the breeding, overwintering, or migratory habitat requirements of each species; (2) evaluating structural characteristics and distribution of each ecological system relative to the species' range and habitat requirements; (3) examining the observation records for each species in the state-wide point observation database associated with each ecological system; and (4) calculating the percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system to get a measure of numbers of observations versus availability of habitat. Species that breed in Montana were only evaluated for breeding habitat use, species that only overwinter in Montana were only evaluated for overwintering habitat use, and species that only migrate through Montana were only evaluated for migratory habitat use. In general, species were listed as associated with an ecological system if structural characteristics of used habitat documented in the literature were present in the ecological system or large numbers of point observations were associated with the ecological system. However, species were not listed as associated with an ecological system if there was no support in the literature for use of structural characteristics in an ecological system, even if point observations were associated with that system. Common versus occasional association with an ecological system was assigned based on the degree to which the structural characteristics of an ecological system matched the preferred structural habitat characteristics for each species as represented in the scientific literature. The percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system was also used to guide assignment of common versus occasional association.

We suggest that the percentage of commonly associated habitat within the report area be used in conjunction with geographic range polygons and the percentage of predicted optimal and moderate suitable habitat from predictive models to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning. Users of this information should be aware that land cover mapping accuracy is particularly problematic when the systems occur as small patches or where the land cover types have been altered over the past decade. Thus, particular caution should be used when using the associations in assessments of smaller areas (e.g., evaluations of public land survey sections).

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Introduction to Land Cover

Land Use/Land Cover is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100,000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download from the Montana State Library's GIS Data List More information on the land cover layer is available at: https://msl.mt.gov/geoinfo/msdi/land_use_land_cover/

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

Literature Cited

Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

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Introduction to Wetland and Riparian

Within the report area you have requested, wetland and riparian mapping is summarized by acres of each classification present. Summaries are only provided for modern MTNHP wetland and riparian mapping and not for outdated (NWI Legacy) or incomplete (NWI Scalable) mapping efforts; described here. MTNHP has made all three of these datasets and associated metadata available for separate download on the Montana Wetland and Riparian Framework web page.

Wetland and Riparian mapping is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The wetland and riparian framework layer consists of spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deep water habitats in Montana.

Wetland and riparian mapping is completed through photointerpretation of 1-m resolution color infrared aerial imagery acquired from 2005 or later. A coding convention using letters and numbers is assigned to each mapped wetland. These letters and numbers describe the broad landscape context of the wetland, its vegetation type, its water regime, and the kind of alterations that may have occurred. Ancillary data layers such as topographic maps, digital elevation models, soils data, and other aerial imagery sources are also used to improve mapping accuracy. Wetland mapping follows the federal Wetland Mapping Standard and classifies wetlands according to the Cowardin classification system of the National Wetlands Inventory (NWI) (Cowardin et al. 1979, FGDC Wetlands Subcommittee 2013). Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands differently than the NWI. Similar coding, based on U.S. Fish and Wildlife Service conventions, is applied to riparian areas (U.S. Fish and Wildlife Service 2009). These are mapped areas where vegetation composition and growth is influenced by nearby water bodies, but where soils, plant communities, and hydrology do not display true wetland characteristics. **These data are intended for use at a scale of 1:12,000 or smaller. Mapped wetland and riparian areas do not represent precise boundaries and digital wetland data cannot substitute for an on-site determination of jurisdictional wetlands.**

See detailed overviews, with examples, of both wetland and riparian classification systems and associated codes as a storymap and companion guide

Literature Cited

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79/31. Washington, D.C. 103pp.

Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.

U.S. Fish and Wildlife Services. 2009. A system for mapping riparian areas in the western United States. Division of Habitat and Resource Conservation, Branch of Resource and Mapping Support, Arlington, Virginia.

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Introduction to Land Management

Within the report area you have requested, land management information is summarized by acres of federal, state, and local government lands, tribal reservation boundaries, private conservation lands, and federal, state, local, and private conservation easements. Acreage for "Owned", "Tribal", or "Easement" categories represents non-overlapping areas that may be totaled. However, "Other Boundaries" represents managed areas such as National Forest boundaries containing private inholdings and other mixed ownership which may cause boundaries to overlap (e.g. a wilderness area within a forest). Therefore, acreages may not total in a straight-forward manner.

Because information on land stewardship is critical to effective land management, the Montana Natural Heritage Program (MTNHP) began compiling ownership and management data in 1997. The goal of the Montana Land Management Database is to manage a single, statewide digital data set that incorporates information from both public and private entities. The database assembles information on public lands, private conservation lands, and conservation easements held by state and federal agencies and land trusts and is updated on a regular basis. Since 2011, the Information Management group in the Montana State Library's Digital Library Division has led the Montana Land Management Database in partnership with the MTNHP.

Public and private conservation land polygons are attributed with the name of the entity that owns it. The data are derived from the statewide Montana Cadastral Parcel layer Conservation easement data shows land parcels on which a public agency or qualified land trust has placed a conservation easement in cooperation with the landowner. The dataset contains no information about ownership or status of the mineral estate. For questions about the dataset or to report errors, please contact the Montana Natural Heritage Program at (406) 444-5363 or mtnhp@mt.gov. You can download various components of the Land Management Database and view associated metadata at the Montana State Library's GIS Data List at the following links:

Public Lands
Conservation Easements
Private Conservation Lands
Managed Areas

Map features in the Montana Land Management Database or summaries provided in this report are not intended as a legal depiction of public or private surface land ownership boundaries and should not be used in place of a survey conducted by a licensed land surveyor. Similarly, map features do not imply public access to any lands. The Montana Natural Heritage Program makes no representations or warranties whatsoever with respect to the accuracy or completeness of this data and assumes no responsibility for the suitability of the data for a particular purpose. The Montana Natural Heritage Program will not be liable for any damages incurred as a result of errors displayed here. Consumers of this information should review or consult the primary data and information sources to ascertain the viability of the information for their purposes.

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Introduction to Invasive and Pest Species

Within the report area you have requested, separate summaries are provided for: Aquatic Invasive Species, Noxious Weeds, Agricultural Pests, Forest Pests, and Biocontrol species that have been documented or potentially occur there based on the predicted suitability of habitat. Definitions for each of these invasive and pest species categories can be found on our Species Status Codes page.

Each of these summaries provides the following information when present for a species: (1) the number of observations of each species; (2) the geographic range polygons for each species, if developed, that the report area overlaps; (3) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (4) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (5) links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers under the Introduction to Native Species above or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what invasive and pest species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are limited, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species will always be an important obligation of users of our data.**

If you are aware of observation or survey datasets for invasive or pest species that the MTNHP is missing, please report them to the Program Coordinator bmaxell@mt.gov Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov If you have animal or plant observations that you would like to contribute, you can also submit them via Excel spreadsheets, geodatabases, iNaturalist, or a Survey123 form. Various methods of data submission are reviewed in this playlist of videos:
https://www.youtube.com/playlist?list=PLRaydtZpHu2qOHPoSPq9cnM9uXGmEXACx

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Additional Information Resources

- MTNHP Staff Contact Information
- Montana Field Guide
- MTNHP Species of Concern Report - Animals and Plants
- MTNHP Species Status Codes - Explanation
- MTNHP Predicted Suitable Habitat Models (for select Animals and Plants)
- MTNHP Request Information page
- Montana Cadastral
- Montana Code Annotated
- Montana Fisheries Information System
- Montana Fish, Wildlife, and Parks Subdivision Recommendations
- Montana GIS Data Layers
- Montana GIS Data Bundler
- Montana Greater Sage-Grouse Project Submittal Site
- Montana Ground Water Information Center
- Montana Index of Environmental Permits, 21st Edition (2018)
- Montana Environmental Policy Act (MEPA)
- Montana Environmental Policy Act Analysis Resource List
- Laws, Treaties, Regulations, and Agreements on Animals and Plants
- Montana Spatial Data Infrastructure Layers
- Montana State Historic Preservation Office Review and Compliance
- Montana Stream Permitting: a guide for conservation district supervisors and others
- Montana Water Information System
- Montana Web Map Services
- National Environmental Policy Act
- Penalties for Misuse of Fish and Wildlife Location Data (MCA 87-6-222)
- U.S. Fish and Wildlife Service Information for Planning and Consultation (Section 7 Consultation)
- Web Soil Survey Tool

MONTANA STATE LIBRARY
NATURAL HERITAGE PROGRAM
A program of the Montana State Library's Natural Resource Information System.

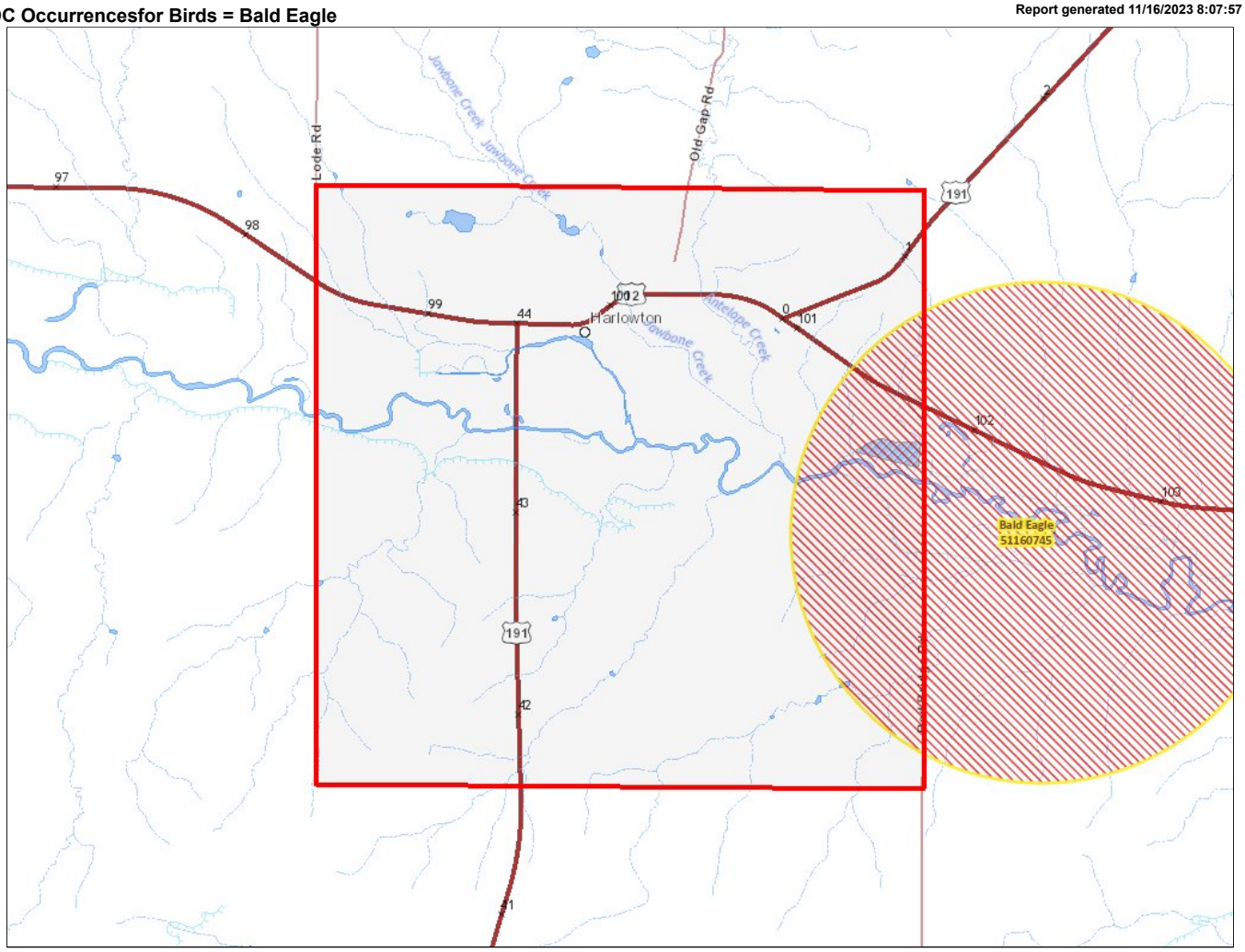
Latitude	Longitude
46.38764	-109.72704
46.46170	-109.93528



Montana SOC Occurrences Report

SOC Occurrencesfor Birds = Bald Eagle

Report generated 11/16/2023 8:07:57 AM



Birds - Bald Eagle *(Haliaeetus leucocephalus)*

SO Count: 1 **Obs Count**: 1 **Earliest Obs**: 2005 **Recent Obs**: 2005

Special Status Species
Native Species
Global Rank: G5
State Rank: S4

Agency Status
USFWS: BGEPA; MBTA
USFS: Sensitive - Known in Forests (LOLO)
BLM: SENSITIVE
FWP SWAP:
PIF: 2

Delineation Criteria
Confirmed nesting area buffered by a minimum distance of 2,000 meters in order to be conservative about encompassing the breeding territory and area commonly used for renesting. Only nesting observations with a locational uncertainty of 1,000 meters or less will be used to delineate a nesting area.

Last Updated
Sep 05, 2023

SO ID: 51160745 **Acres**: 3,105 **Obs Count**: 1 **Earliest Obs**: 2005 **Recent Obs**: 2005

Citation for this report:
Montana SOC Occurrences Report
SOC Occurrencesfor Birds = Bald Eagle
Within Lat/Long: (46.38764,-109.72704) to (46.46170,-109.93528)
Natural Heritage Map Viewer. Montana Natural Heritage Program.
Retrieved on November 16, 2023, from https://mtnhp.org/MapViewer/SOReport.aspx

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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

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Location

Wheatland County, Montana



Local office

Montana Ecological Services Field Office

(406) 449-5225
(406) 449-5339

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585 Shephard Way, Suite 1
Helena, MT 59601-6287

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

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2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

NOT FOR CONSULTATION

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

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- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Dec 1 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

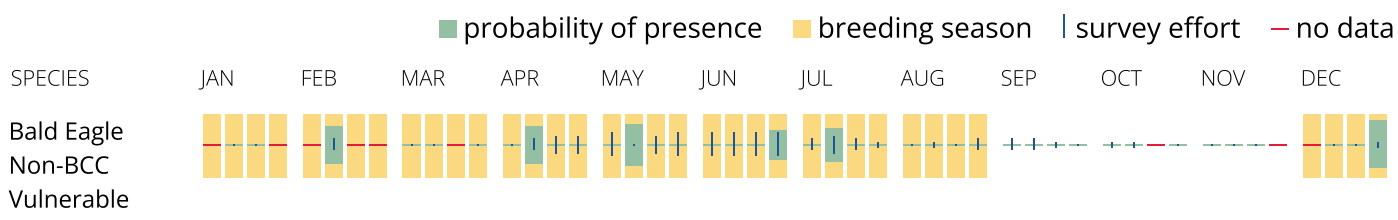
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

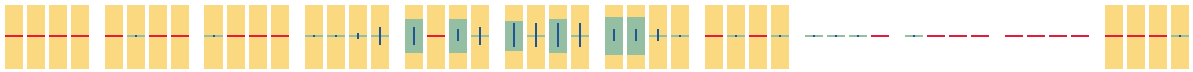
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Golden Eagle
Non-BCC
Vulnerable



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON
Baird's Sparrow *Ammodramus bairdii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5113	Breeds May 20 to Aug 15
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31

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Black Tern Chlidonias niger — Breeds May 15 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3093

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

California Gull Larus californicus — Breeds Mar 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Chestnut-collared Longspur Calcarius ornatus — Breeds May 1 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ferruginous Hawk Buteo regalis — Breeds Mar 15 to Aug 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/6038

Franklin's Gull Leucophaeus pipixcan — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds Dec 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lark Bunting Calamospiza melanocorys — Breeds May 10 to Aug 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Marbled Godwit Limosa fedoa — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

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Mountain Plover Charadrius montanus — Breeds Apr 15 to Aug 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3638

Prairie Falcon Falco mexicanus — Breeds Mar 1 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4736

Sprague's Pipit Anthus spragueii — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8964

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

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2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

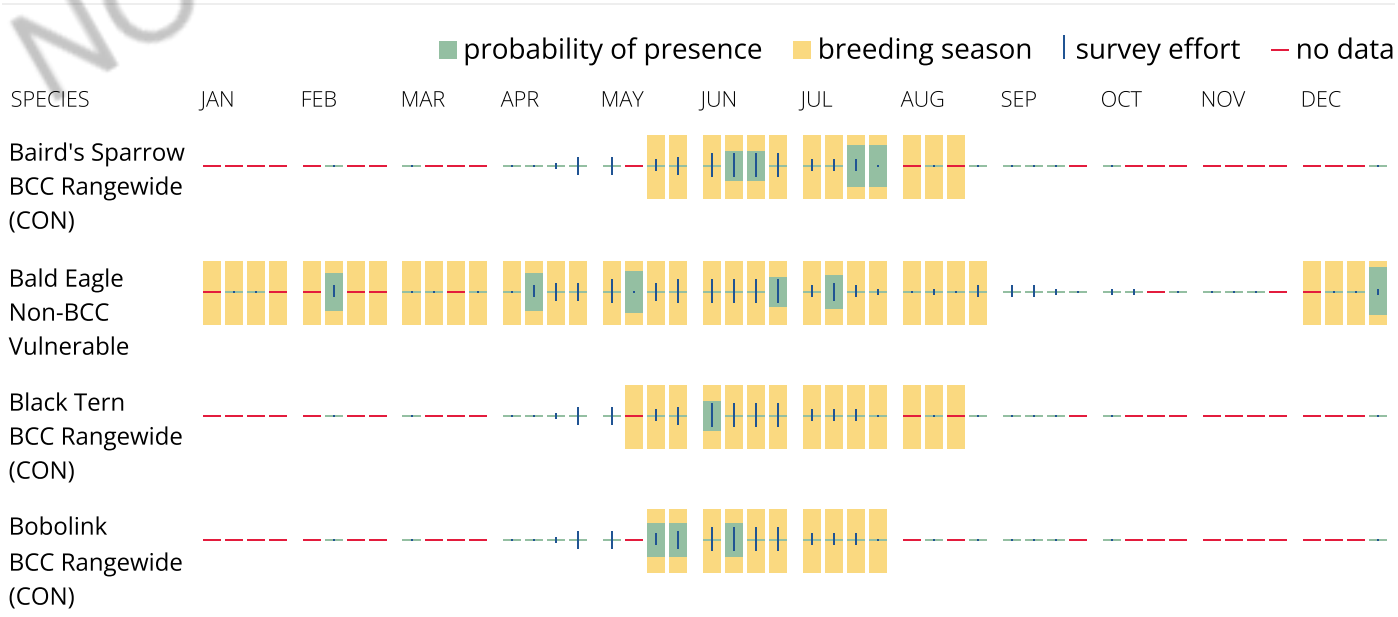
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

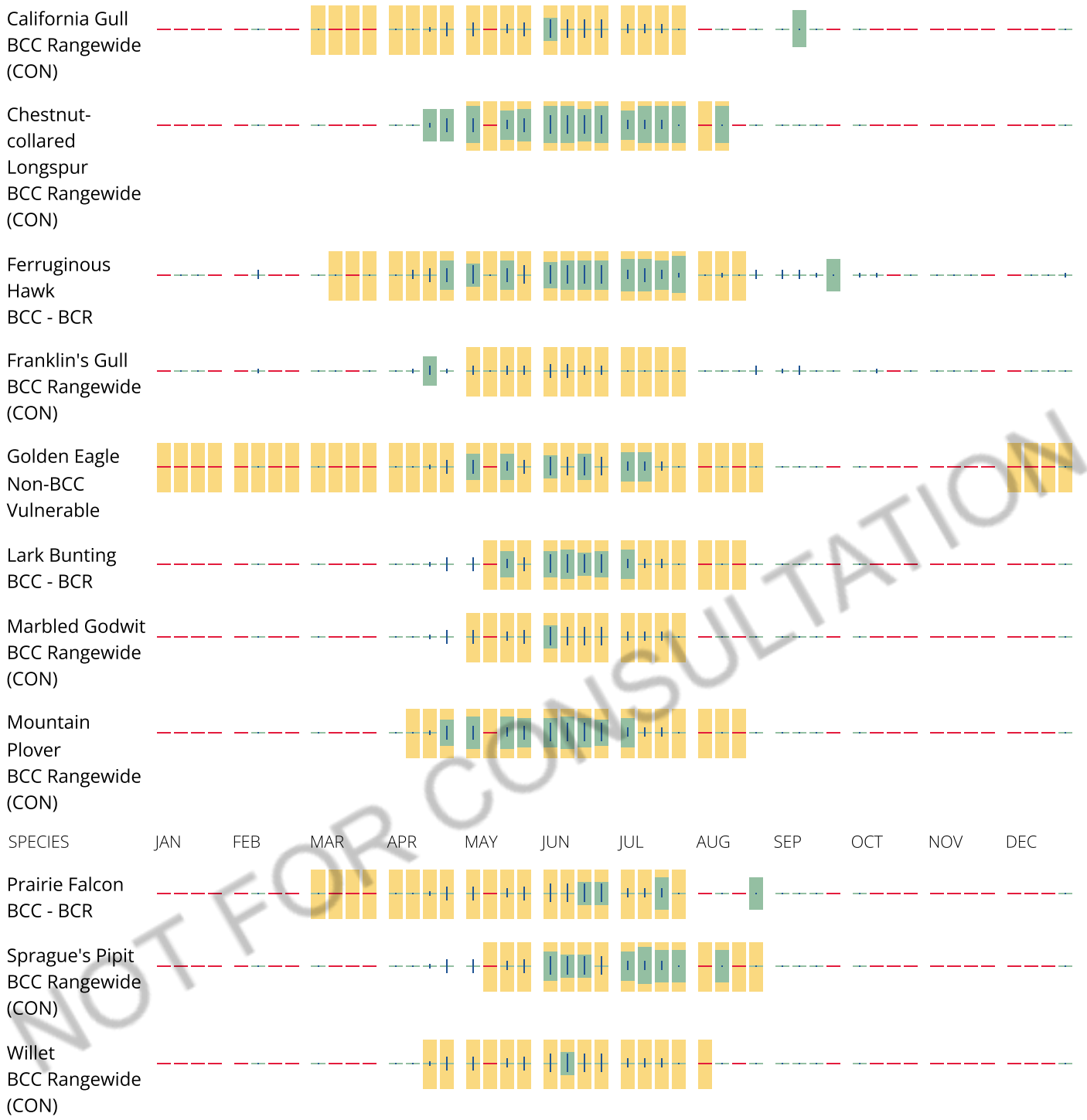
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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NOT FOR CONSULTATION

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

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What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

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Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

NOT FOR CONSULTATION

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

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The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

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Download Data

Pl D wi v. vetlands/Data/Data-Download.html) page for information on how to download data, what is included in the download and data use limitations and disclaimer.

Click the map to select a watershed from which to extract wetland data.

- By State
- Web Services

Before You Begin

NWI data can be accessed in several ways depending on your needs. To display and query wetlands data in your software application please use our Web Map Services. This will ensure you have the latest data and reduce data management overhead. If you need to conduct GIS analysis please reference the information below and download the data by watershed or by state. For downloads larger than a state, please contact the Wetlands Team to request a custom download.

Please note that NWI data is continuously being improved and new data is added on a biannual basis. Those updates are reflected on the Wetlands Mapper and in the data downloads in October and May of each year. To ensure that you have the most up to date information, please refer to the published date in the metadata, the location of new data on the Projects Mapper and download new data regularly.

- Each State and watershed data download is available as either a compressed file Geodatabase or a Shapefile. Both files are compressed by using the .zip format and contain the following layers:
    - Wetlands polygon data - Version 2
    - Wetlands Project Metadata - Version 2 (includes image dates and project information)
    - Wetlands Historic Map Information*
    - Riparian polygon data*
    - Riparian Project Metadata (includes image dates and project information)*
    - Historic Wetlands*
    - Historic Wetlands Project Metadata (includes image dates and project information)*
    - Watershed Boundary Dataset (WBD) HUC8 modified**

    * If available at the requested location.
    ** Not included in State downloads.
    Information about each of these layers can be found on our Metadata page.

- Not all of Alaska has been digitally mapped by the U.S. Fish and Wildlife Service. Please refer to the Wetlands

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Mapper Wetlands Mapping Status layer to view where wetlands have been mapped in Alaska. The state downloads include a Wetlands Project Metadata layer that identifies where and when wetlands were mapped within the state.

Downloading Tips

- If an error occurs during your download, or if your downloaded file(s) is corrupted, we strongly recommend the use of a download manager. Please visit the Frequently Asked Questions page for more information on this topic. For security reasons, we are not allowed to served data via FTP.
- Due to the amount of data being downloaded, the resulting time to download each file may take up to 60 minutes or more, and each file can range in sizes from 1MB to approximately 1GB.

Download data by watershed

Click on the button below and select the (HUC 8) watershed data you wish to download.

Select Watershed

Download data by state

State data can be obtained here: https://www.fws.gov/program/national-wetlands-inventory/download-state-wetlands-data or, use the pull down menu below to select the state data you wish to download.

Select a state: ...

NOTE: Due to the variation in use and analysis of this data by the end user, each of states wetlands data extends beyond the state boundary. Each state includes wetlands data that intersect the 1:24,000 quadrangles that contain part of that state (1:2,000,000 source data). This allows the user to clip the data to their specific analysis datasets. Beware that two adjacent states will contain some of the same data along their borders.

Many of the data layers on the Wetlands Mapper can be displayed and queried in your software applications by using the following web mapping services:

REST service address (more info):
https://fwspublicservices.wim.usgs.gov/wetlandsmapservice/rest/services

Web Mapping Service (WMS) address (more info):
https://fwspublicservices.wim.usgs.gov/wetlandsmapservice/services/Wetlands/MapServer/WMSServer?request=GetCapabilities&service=WMS

Keyhole Markup Language (KML) file (more info):
Wetlands-Data.kml

Close

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Close

×

National Wetlands Inventory

- About the Application
- Disclaimer
- Data Limitations
- Wetlands Geodatabase User Caution

The National Wetlands Inventory (NWI) was established by the US Fish and Wildlife Service (FWS) to conduct a nationwide inventory of U.S. wetlands to provide biologists and others with information on the distribution and type of wetlands to aid in conservation efforts.

This web mapping application provides users with access to over 34 million features that represent the extent, approximate location and type of wetlands and surface water habitats in the United States and U.S. trust territories.

Users can navigate around the map using pan and zoom functions or use the find location button to enter a place name or address. Mobile devices can leverage the GPS functionality to zoom to your current coordinates using the Find My Location button. The application also provides the ability to download wetland maps (PDF) and geospatial wetlands data to your computer.

Refer to the following links for documentation and answers to frequently asked questions:

- Wetlands Mapper Documentation and Instructions Manual (PDF)
- Frequently Asked Questions: Wetlands Mapper (PDF)
- VIDEO: How to find and use the U.S Fish and Wildlife Service's Wetlands Mapper

For general questions about wetland maps and the Wetlands Mapper: Wetlands_Team@fws.gov

Disclaimer

The use of trade, product, industry or firm names or products is for informative purposes only and does not constitute an endorsement by the U.S. Government or the Fish and Wildlife Service. Links to non-Service Web sites do not imply any official U.S. Fish and Wildlife Service endorsement of the opinions or ideas expressed therein or guarantee the validity of the information provided. Base cartographic information used as part of the Wetlands Mapper has been provided through a license agreement with ESRI and the Department of the Interior.

Data Limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

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The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Exclusions - Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

By policy, the Service also excludes certain types of "farmed wetlands" as may be defined by the Food Security Act or that do not coincide with the Cowardin et al. definition. Contact the Service's Regional Wetland Coordinator for additional information on what types of farmed wetlands are included on wetland maps.

Precautions - Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

The Wetlands Geodatabase is an ongoing effort consisting of data additions, updates, and other data modifications. All datasets utilized outside of the Wetlands Geodatabase or the Wetlands Mapper and supporting web services are only effective as of the date of extraction or delivery by the Wetlands Geodatabase Administrator. The Wetlands Mapper displays the current status of wetlands data availability.

This data set represents the extent, approximate location and type of wetlands and deepwater habitats in the United States and select U.S. trust territories.

These data were developed in conjunction with the publication Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC. FWS/OBS-79/31. Alpha-numeric map codes have been developed to correspond to the wetland and deepwater classifications described.

These spatial data are not designed to stand alone. They were originally developed as topical overlays to the U.S. Geological Survey 1:24,000 or 1:25,000 scale topographic quadrangles or digital imagery. Note that coastline delineations were drawn to follow the extent of wetland or deepwater features as described by this project and may not match the coastline shown in other base maps. The map products were neither designed nor intended to represent legal or regulatory products.

Comments regarding the interpretation or classification of wetlands or deepwater habitats can be directed to the U.S. Fish and Wildlife Service, Division of Ecological Services or by contacting Wetlands_Team@fws.gov

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government. For additional information visit the product summary and metadata web pages.

Close

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Basemaps



Map Layers

Legend

- General
- Description
- Reports
- About

This acre habitat is classified as a . For a complete code description, click here.

Zoom to wetland
Zoom to project area

Classification code:

System () :
Subsystem () :
Class () :
Subclass () :
Split Class () :
Split Subclass () :
Water Regime () :
() :
() :
For more information on wetland classification codes click here.

Below are links to wetland related documents for this area.

Historic Map Information

Local

County

State

Regional

National

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Data Limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis. Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Wetland Regulations

The wetlands displayed on the Wetlands Mapper show wetland type and extent using a biological definition of wetlands. There is no attempt to define the limits of proprietary jurisdiction of any Federal, State, or local government, or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

For information about regulations that may affect wetlands or development on your property, contact the U.S. Army Corps of Engineers office nearest you: http://www.usace.army.mil/Locations.aspx.

Application
Disclaimer
Data Limitations
Wetlands Geodatabase User Caution
Wetland FAQ

Measure

Map scale 1:
Latitude y | **Longitude** x (center)

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National Wetlands Inventory

surface waters and wetlands

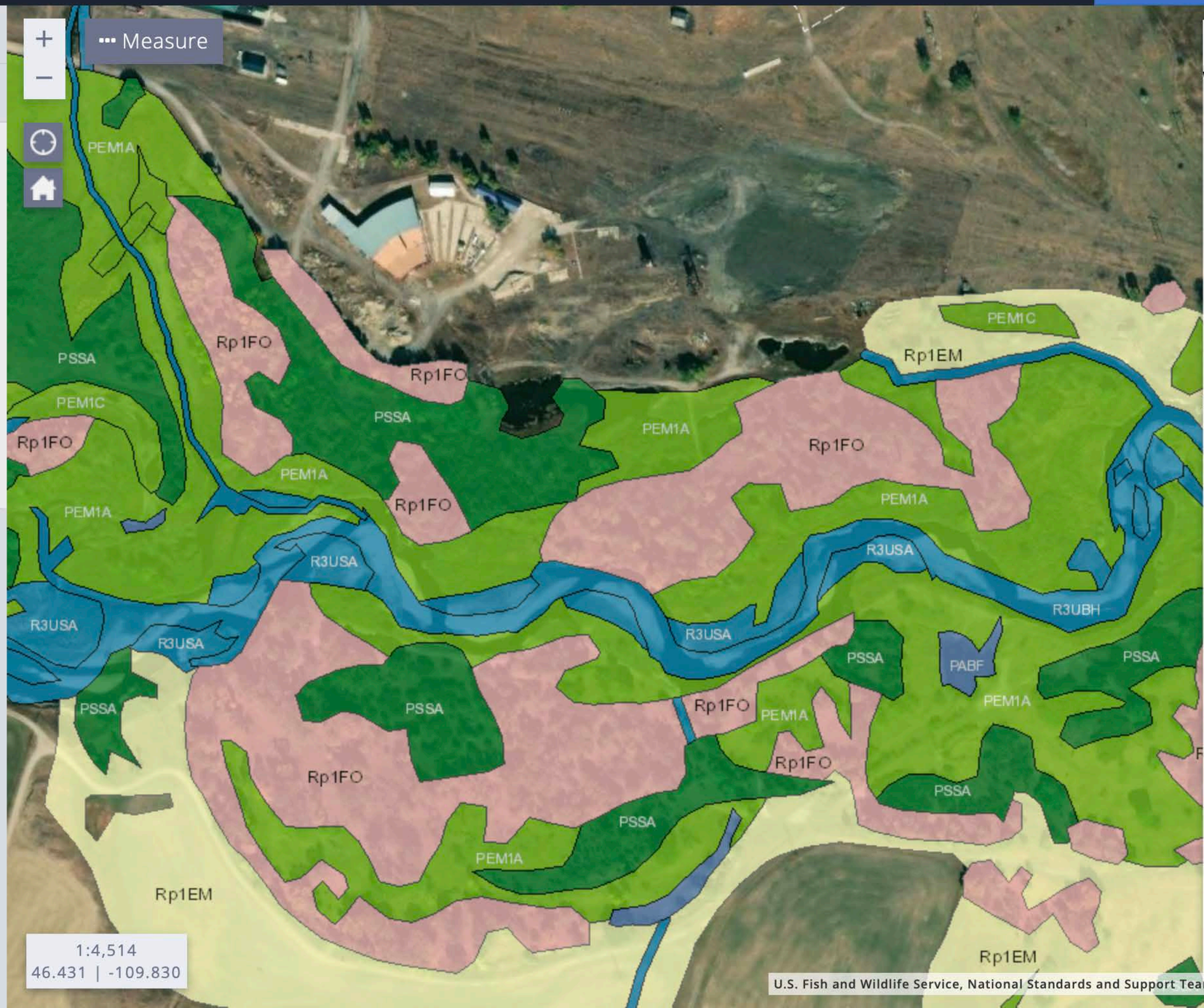
ABOUT | GET DATA | PRINT | FIND LOCATION

BASEMAPS >

MAP LAYERS >

- [x] Wetlands
- [x] Riparian
- [ ] Riparian Mapping Areas
- [x] Data Source
  - Source Type
  - Image Scale
  - Image Year
- [ ] Areas of Interest
- [ ] FWS Managed Lands
- [ ] Historic Wetland Data

Measure



LEGEND

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Riparian

- Forested/Shrub
- Herbaceous

1:4,514
46.431 | -109.830

U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands_team@fws.gov | Maxar | ...

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MONTANA HISTORICAL SOCIETY
State Historic Preservation Office

CU-R FORM

SITE RECORD UPDATE FOR CS-R AND AE-R

1/2023

1. Identification

SITE NAME/FIELD DESIGNATION	SMITHSONIAN NUMBER (issued by SHPO)^	RECORD TYPE
Milwaukee Railroad District	24WL0098	**XX** UPDATE

UPDATED BY	DATE	PHONE (000) 000-0000	EMAIL	ADDRESS
Strait, James	5/30/2023	406-444-6765	jstrait@mt.gov	1520 E 6th Ave, Helena

2. Location

COUNTY	LOT/BLOCK	STREET ADDRESS	CITY / TOWN (NEAREST)
Wheatland			Harlowton

TOWNSHIP	N/S	RANGE	E/W	SECTION	QUARTER	TOWNSHIP	N/S	RANGE	E/W	SECTION	QUARTER
8	N	15	E	27	NE						

(tab from last cell to add rows to the TRS table)

3. Ownership

CURRENT ADMINISTRATIVE/SURFACE OWNERSHIP	CURRENT USE	
City of Harlowton	Vacant	☒ Public ☐ Private

4. Site Description / Conditions

SITE/PROPERTY TYPE* (SEE RECOMMENDED SITE TYPE LIST; TYPE ALL THAT APPLY)

Historic Railroad

DESCRIPTION OF SITE/PROPERTY (OVERVIEW OF SITE, FEATURES, ARTIFACTS, AND CONDITION)

The Milwaukee Railroad Historic District is located on the flats of the Musselshell river and the south end of Central Avenue South, just outside of the city limits of Harlowton. The depot and several other features identified in the original NRHP nomination form area still present, though others have been lost to time. The entire complex was abandoned by the railroad in March 1980.

CHANGES SINCE LAST RECORDING

Some remediation activity has taken place, with no impacts to the existing contributing features. Additional information regarding buried features have been identified that warrant evaluation of the site under Criterion D.

CURRENT CONDITION / INTEGRITY

Conditions of existing contributing elements have not changed. Some remediation activity has taken place since the 2020 update, and further work is being funded by the EPA which will bring the site remediation activity into a Federal Action, necessitating adherence with Section 106.

5. National Register Evaluation and Assessment

HAS A FORMAL ELIGIBILITY DETERMINATION BEEN PREVIOUSLY ISSUED FOR THIS SITE/PROPERTY?

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☐ No formal determination ☐ Yes, determined NOT eligible ☐ Yes, determined eligible ☒ Yes, listed ☐ Unknown

ELIGIBILITY PROCEDURES / JUSTIFICATION+

The Milwaukee Railroad District is currently listed on the NRHP under Criterion A and C. In 2020, DEQ provided an update to the site form due to a wetlands restoration project (Strait 2020). During this updated, it was revealed through historic documents that a community of Japanese immigrants once lived in an area to the south and southeast of the Roundhouse. Since that update, additional archival research has been conducted, and is ongoing, regarding the names and histories of the families that lived there. Part of this effort was targeted to recover a railroad boxcar that was once on the location of the Jim Sataki Family. To date, efforts to rase funds to return the box car to the district have been unsuccessful, but not abandoned.

Geophysical work conducted in 2022 (Tetra Tech 2022: Attachment A) which was related primarily to the exploration of additional contaminants and remediation target features, provided evidence of buried foundations at locations identified in the 2020 site update form, likely associated with the Japanese community. Based on this new work, there is strong evidence that these anomalies are related to domestic structures used by Japanese members of the community. This finding has provided a strong argument that the site has the potential for addressing important archeological research questions about the District and the immigrant population that lived there. Therefore the District is now also eligible under Criterion D to the existing NRHP listing.

A Programmatic Agreement and mitigation plan is in development to address ongoing impacts at the site, which is proposed to include excavations, historical archival research and public interpretive signage for the end of project development.

6. Sources

LIST CITATIONS FOR INFORMATION SOURCES USED TO COMPLETE THIS FORM

Strait, James
2020 Harlowton Wetlands Remediation Project Cultural Resource Inventory, Wheatland County, Montana.

Tetra Tech
2022 Phase II Environmental Site Assessment Geophysical Survey Report. Superfund Technical Assessment and Response Team (START) V Contract No. 68-HE-0820-D0001, Prepared for the US Environmental Protection Agency, Denver.

7. List of Updated Photographs and Maps Attached to this Form

FIGURE NUMBER	DESCRIPTION / CAPTION	PHOTOGRAPHER	PHOTO DATE

(tab from last cell to add rows to the photos and maps table)

IMPORTANT: DO NOT insert images into this document. Supporting photographs, maps, and other figures referenced in Table 7 need to be formatted, saved, and submitted according to SHPO's *Guidelines and Samples for CSR/AER Form Attachments*. For more detailed mapping and photography standards, please review *Montana SHPO Consultation Guide, 2023*.

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^ See **Checklist 2: Submitting Site Records and Requesting Smithsonian Numbers** (Appendix D.2) and **Documenting Sites** (section 2.3) of the Montana SHPO Consultation Guide, 2023.
Online: https://mhs.mt.gov/Shpo/Archaeology/ConsultingWith

* See **Site/Property Types, Time Periods, and Diagnostic Types for Cultural and Architectural-Engineering Records**.
Online: https://mhs.mt.gov/Shpo/docs/CSR_AER_Codes.pdf

+ See **How to Apply National Register Criteria for Evaluation**. National Park Service, National Register Bulletin. 1997.
Online: https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf

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Appendix A

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Phase II Environmental Site Assessment Geophysical Survey Report

Harlowton Railyard
Harlowton, Montana

Superfund Technical Assessment and Response Team (START) V Contract
Contract No. 68-HE-0820-D0001, Task Order 82,
Technical Direction No. 2082-2201-01, TD DTN 1618



September 2, 2022

PREPARED FOR

U.S. Environmental Protection Agency
Region 8
Brownfields and Redevelopment Branch
1595 Wynkoop Street
Denver, Colorado 80202

PREPARED BY

Tetra Tech, Inc.
825 West Custer Avenue
Helena, Montana 59602
(406) 442-5588

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FIGURES

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FIGURE 2: SITE VICINITY MAP

FIGURE 3: SITE FEATURES MAP

FIGURE 4: EM61-MK2 SURVEY RESULTS

FIGURE 5: MAGNETOMETER SURVEY RESULTS

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FIGURE 7: EM31-MK2 IN-PHASE SURVEY RESULTS

FIGURE 8: GPR SURVEY AREA 1 RESULTS

FIGURE 9: GPR SURVEY AREAS 2 AND 3 RESULTS

APPENDIX

APPENDIX A: PHOTOGRAPHIC DOCUMENTATION

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ACRONYMS AND ABBREVIATIONS

AST	Aboveground storage tank
ASTM	ASTM International
bgs	Below ground surface
DGM	Digital Geophysical Mapping
DGPS	Differential global positioning system
EM	Electromagnetic
EM31	Geonics EM31-MK2 terrain conductivity meter
EM61	Geonics EM61-MK2 time-domain electromagnetic instrument
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
GPR	Ground-penetrating radar
GPS	Global positioning system
GSSI	Geophysical Survey Systems, Inc.
MDEQ	Montana Department of Environmental Quality
MHz	Megahertz
MPDES	Montana Pollutant Discharge Elimination System
mS/m	MilliSiemens per meter
mV	MilliVolts
NMEA	National Marine Electronics Association
NOAA	National Oceanic and Atmospheric Administration
nT	NanoTesla
ppt	Parts per thousand
QAPP	Quality assurance protection plan
SAP	Sampling and analysis plan
START	Superfund technical assessment and response team
Site	Harlowton Railyard Site
TBA	Targeted Brownfields Assessment
Tetra Tech	Tetra Tech, Inc.
UST	Underground storage tank

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EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) Region 8 Land, Chemicals, and Redevelopment Division tasked the Tetra Tech, Inc. (Tetra Tech) Region 8 Superfund Technical Assessment and Response Team (START) V to conduct a Targeted Brownfields Assessment (TBA) Phase II Environmental Site Assessment (ESA) geophysical survey at the Harlowton Railyard (the Site) at 400 A Avenue Southeast in Harlowton, Montana. The city of Harlowton, via the Montana Department of Environmental Quality (MDEQ) (TBA recipient), requested assistance under the TBA program from EPA Region 8 to perform a Phase II ESA geophysical survey at the Site.

The Harlowton Milwaukee Road Roundhouse and Railyard operated as a railroad engine repair and refueling station from 1900 to 1979. Site activities included maintenance, servicing, and classification of railroad equipment. During railroad operations, wastewater from the engine terminal was discharged into a retention/settling pond. This wastewater consisted primarily of water used in the engine repair process, but also included cooling water, diesel overflows, boiler feed water, and water from the sanitary system. The settling pond was in the southeast portion of the Site adjacent to a slough that enters the Musselshell River. Additionally, the Milwaukee Railroad maintained a 500,000-gallon diesel aboveground storage tank (AST) for refueling locomotives located between the settling pond and the roundhouse building (Montana Department of Environmental Quality [MDEQ] 2022). In 1970, an oil separator unit was installed at the Site that collected the wastewater from the settling pond and removed any free product. Free product that flowed into the system was collected by a skimmer and pumped into an AST. This system was covered under a Montana Pollutant Discharge Elimination System (MPDES) permit from 1971 to November 2016, when the system was removed during remediation activities (MDEQ 2022).

The railyard has significant diesel contamination in surface and sub-surface soils, groundwater, surface water, and sediments from historic railyard practices and failures in the diesel fuel AST and refueling equipment. To date, MDEQ and its contractors have uncovered six buried and previously unidentified underground storage tanks (USTs) during excavation/contamination removal conducted in two phases. Findings also included numerous pipe runs and other conduits that historically transported waste fluids at the facility. Discovery of unknown USTs and pipe runs have resulted in disruption and delays of remediation excavation activities. In addition, there is potential for historically significant foundations or remains of former refuge rooms for immigrant railroad workers at portions of the Site (MDEQ 2022).

The objective of the Phase II ESA geophysical survey was to help identify potential subsurface contamination sources and preferential pathways for contaminants prior to starting the next phase of contaminated soil removal. In addition, the objective was to identify anomalies potentially related to cultural and historically noteworthy features suspected of being present at portions of the Site, specifically

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any foundation or remnants of former refuge rooms for immigrants that had worked on the railroad. The purpose of the geophysical survey was to detect and map potential:

- Buried USTs, vaults, and sumps;
- Backfilled excavations associated with former UST removal;
- Underground product lines and other subsurface features associated with existing or former USTs;
- Debris disposal areas;
- Detectable underground utilities, pipe runs, conduits, and other structures (potential preferential pathways for contaminant migration); and
- Remnants of underground rooms formerly occupied by immigrants that worked on the railroad.

The geophysical investigation was conducted from May 9 through 13, 2022, using the following instruments for detection and mapping of subsurface features:

- Geonics EM61-MK2 (EM61) time-domain all metals detector (electromagnetic [EM] instrument);
- Geometrics G-858 cesium vapor magnetometer 2-sensor array;
- Geonics EM31-MK2 (EM31) frequency-domain terrain electrical conductivity meter;
- Geophysical Survey Systems, Inc. (GSSI) SIR 4000 ground-penetrating radar (GPR) with a 350-megaHertz (MHz) transducer/antenna;
- Radio Detection (RD)-8000 line tracer; and
- Juniper Systems Geode differential global positioning system (DGPS).

Geophysical data were interpreted in real-time as the survey progressed, and provided the following findings:

- The geophysical investigation did not clearly reveal the presence of USTs, backfilled excavations associated with former UST removal, or sumps at the Site. However, several apparent subsurface debris areas or anomaly areas were detected at the Site that may include remnant debris associated with these features or may have masked anomalies associated with these features. Six wood vaults and one pump vault were found and mapped at the surface with DGPS. In addition, four unknown vaults constructed of vertical corrugated metal pipe were observed at the surface and in-line with a detected underground utility line.
- The EM61, magnetometer, and EM31 digital geophysical mapping (DGM) surveys and line tracer survey detected multiple underground utility lines or other linear features across the Site. Some of the underground lines may be utility lines, drain lines, pipe runs, conduits, or other linear

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structures, which can act as preferential contaminant migration pathways. Underground lines leading to former locations of USTs and ASTs (such as the oil tank tower) could be former product lines or associated piping, which could be contaminant sources if they have leaked.

- The DGM surveys detected several apparent subsurface debris areas or anomaly areas within the Site totaling 3.5 acres. The apparent subsurface debris areas are associated with areas containing significant surface and subsurface metal debris. The EM61 primarily emphasized smaller and/or shallower ferrous and non-ferrous metal debris, and the magnetometer detected ferrous metals debris and to a greater depth. The EM31 emphasized larger and more concentrated ferrous, non-ferrous, and non-metallic debris. Many of the anomalies within the apparent subsurface debris areas or anomaly areas appear to be associated with scrap metal and construction demolition debris (e.g., reinforced concrete, supports, piping, and other metal debris associated with the former railyard) similar to debris observed at the surface. Areas containing higher densities and/or amplitudes of EM and magnetic anomalies were mostly detected in the northern and central portions of the Site where the majority of former Site structures were located. Therefore, many of these anomalies may be associated with construction demolition debris or possible foundation remnants. The GPR data collected over the EM and magnetic anomalies was inconclusive as to the cause or nature of the anomalies. Based on the extent of the apparent subsurface debris areas or anomaly areas delineated from the DGM surveys, the apparent subsurface debris areas or anomaly areas may extend beyond the boundaries of Site survey areas.
- The EM31 quadrature phase detected several areas of relatively high electrical conductivity at the Site. These high quadrature phase values (45 milliSiemens per meter [mS/m] or higher) may be associated with an increase in soil moisture or fines, shallow groundwater, contrast in fill material, and/or contamination. One high electrical conductivity location at the central portion of the Site recently excavated months before the geophysical survey contained saturated soil and free product seepage at the surface at the time of the survey.
- The GPR survey of GPR Survey Area 1 (possible former immigrant refuge area) detected two GPR anomalies that could be associated with backfilled excavations or buried remnants of former dwellings or structures. The GPR anomalies were detected at an approximate depth of 1 to 2 feet below ground surface (bgs). No EM or magnetic anomalies coincided with the GPR anomalies; therefore, the nature of the anomalies is likely non-metallic in origin. No significant or noteworthy GPR anomalies were detected in GPR Survey Area 2 (possible former immigrant refuge area). A GPR anomaly consisting of a series of anomalies in a linear alignment was detected at an approximate depth of 1 to 2 feet bgs at GPR Survey Area 3 (possible former immigrant refuge area). The EM61 and EM31 DGM surveys also detected an apparent subsurface debris area or anomaly area over much of this GPR anomaly. Therefore, the nature and origin of the GPR

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anomaly is unknown; however, it could be related to former structural foundation posts associated with former dwellings or other remnant structures.

Based on the geophysical findings, START V recommends that more direct methods of investigation be conducted to further assess the nature and extent of the features described above. Such proposed methods may include excavation of exploratory trenches, test pits, and soil borings to confirm the source of the anomalies and to evaluate soil for the presence of chemicals of potential concern associated with past Site activities.

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region 8 Land, Chemicals, and Redevelopment Division tasked the Tetra Tech, Inc. (Tetra Tech) Region 8 Superfund Technical Assessment and Response Team (START) V to conduct a Targeted Brownfields Assessment (TBA) Phase II Environmental Site Assessment (ESA) geophysical survey at the Harlowton Railyard (the Site) at 400 A Avenue Southeast in Harlowton, Montana. The City of Harlowton via the Montana Department of Environmental Quality (MDEQ) (TBA recipient) requested assistance under the TBA program from EPA Region 8 to perform a Phase II ESA geophysical survey at the Site.

The field activities described in this geophysical report were conducted on May 9 through May 13, 2022. Geophysical data were collected at the Site in accordance with the site-specific sampling and analysis plan (SAP) (Tetra Tech 2022a), quality assurance project plan (Tetra Tech 2020), and the project-specific health and safety plan (Tetra Tech 2022b). The methods, data, results, conclusions, and recommendations of the geophysical survey are presented in this report.

SITE DESCRIPTION AND BACKGROUND

The Site is a 4-acre lot that is part of the Harlowton Milwaukee Road Roadhouse and Railyard in Harlowton, Fergus Country, Montana (FIGURE 1 and FIGURE 2). The geographic coordinates at the approximate center if the Site are 46.428918 degrees north latitude and -109.825816 degrees west latitude. The Site is on the southeast side of Harlowton and on the floodplain of the Musselshell River. Access to the Site is along A Avenue southeast to the north of the Site (FIGURE 2). The Site is currently undeveloped and consists primarily of unpaved, soil groundcover with sparse vegetation, grass, and a few trees. The Site contains several unpaved roads, remnant foundations, former oil tank and sand towers, several vaults, former remediation excavations, and surface debris areas consisting of construction demolition debris, removed tanks, scrap metal, and wood debris. Site conditions are depicted in the photographic log in Appendix A.

The Harlowton Milwaukee Road Roundhouse and Railyard operated as a railroad engine repair and refueling station from 1900 to 1979. Site activities included maintenance, servicing, and classification of railroad equipment. During railroad operations, wastewater from the engine terminal was discharged into a retention/settling pond. This wastewater consisted primarily of water used in the engine repair process, but also included cooling water, diesel overflows, boiler feed water, and water from the sanitary system serving 75 employees. The settling pond was in the southeast portion of the Site adjacent to a slough that enters the Musselshell River. Additionally, the Milwaukee Railroad maintained a 500,000-gallon diesel aboveground storage tank (AST) for refueling locomotives that was located between the settling pond and the roundhouse building (MDEQ 2022).

In 1970, an oil separator unit was installed at the Site that collected the wastewater from the settling pond and removed any free product. Free product that flowed into the system was collected by a skimmer and

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pumped into an AST. This system was covered under a Montana Pollutant Discharge Elimination System (MPDES) permit from 1971 to November 2016, when the system was removed during remediation activities (MDEQ 2022).

The railyard has significant diesel contamination in surface and sub-surface soils, groundwater, surface water, and sediments from historic railyard practices and failures in the diesel fuel AST and refueling equipment. MDEQ's Brownfields program has been assisting the City of Harlowton since 2015 to apply for and manage numerous assessment and cleanup grants to quantify and address diesel, heavy metals, and asbestos contamination located within the historic railyard. To date, MDEQ and its contractors have uncovered six buried and previously unidentified underground storage tanks (USTs) during excavation/contamination removal conducted in two phases: Phase 1 in 2016 and phase 2 in 2019 (FIGURE 3). Findings also included numerous pipe runs and other conduits that historically transported waste fluids at the facility. The discovery of unknown USTs and pipe runs have resulted in disruption and delays of remediation excavation activities. In addition, there is potential for historically significant foundations or remains of former refuge rooms for immigrant railroad workers at portions of the Site (FIGURE 3) (MDEQ 2022).

SCOPE OF WORK

The Phase II ESA geophysical survey included electromagnetic (EM) and magnetic digital geophysical mapping (DGM), ground penetrating radar (GPR), and line tracer surveys. The objective of the Phase II ESA geophysical survey was to help identify potential subsurface contamination sources and preferential pathways for contaminants prior to starting the next phase of contaminated soil removal. In addition, the objective was to identify subsurface anomalies potentially related to cultural and historically noteworthy features suspected of being present at portions of the Site, specifically any foundation or remnants of former refuge rooms for immigrants that had worked on the railroad.

The purpose of the geophysical survey was to detect and map potential:

- Buried USTs, vaults, and sumps;
- Backfilled excavations associated with former UST removal;
- Underground product lines and other subsurface features associated with existing or former USTs;
- Debris disposal areas;
- Detectable underground utilities, pipe runs, conduits, and other structures (potential preferential pathways for contaminant migration); and
- Remnants of underground rooms formerly occupied by immigrants that worked on the railroad.

START V performed the geophysical survey to delineate any subsurface anomalies possibly related to the features above.

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2.0 GEOPHYSICAL INVESTIGATION METHODS

The geophysical investigation included the use of the following instruments for detection and delineation of subsurface features:

- Geonics EM61-MK2 (EM61) time-domain all metals detector (electromagnetic [EM] instrument);
- Geometrics G-858 cesium vapor magnetometer 2-sensor array;
- Geonics EM31-MK2 (EM31) frequency-domain terrain electrical conductivity meter;
- Geophysical Survey Systems, Inc. (GSSI) SIR 4000 ground-penetrating radar (GPR) with a 350-megaHertz (MHz) transducer/antenna;
- Radio Detection (RD)-8000 line tracer; and
- Juniper Systems Geode differential global positioning system (DGPS).

Geophysical data were interpreted in real time as the survey progressed. At the end of the survey, marked subsurface features and surface features were mapped with a Trimble Geo7x DGPS. ArcMap software was used to create final geophysical data maps and to overlay geophysical data on current and historical aerial imagery to provide more substantiated interpretation of the geophysical data.

A photographic log documenting field activity is provided in Appendix A. START V's Project Manager for the survey was Nora Dwyer. The field team included a senior geophysicist Aaron Puente and geophysicist Grace Ashmore.

START V submitted a site-specific SAP in support of assessment activities to EPA in March 2022 (Tetra Tech 2022a). EPA approved the SAP prior to the survey at the Site. Field activities were conducted in accordance with the SAP, except where noted in the following subsections.

START V prepared this Phase II ESA geophysical survey report in accordance with generally accepted industry practices and procedures. The data evaluation and assessment stated herein constitute a professional opinion; no other warranty is expressed or implied.

START V provided these services consistent with the level and skill ordinarily exercised by members of the profession currently practicing under similar conditions. This statement is in lieu of other statements either expressed or implied. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or reuse of this document, findings, conclusions, or recommendations is at the risk of said user. This geophysical survey report does not warrant against future operations or conditions that may not be consistent with its recommendations.

The following subsections describe the geophysical survey equipment, data collection, and analysis, and specify assumptions and deviations regarding the survey at the Site.

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EM61 SURVEY

The EM61 is a high-resolution, time-domain EM instrument used for detecting buried electrically conductive ferrous and non-ferrous metal objects, such as steel USTs and metallic underground utility lines and debris. It consists of a powerful transmitter that generates a pulsed primary magnetic field when its coils are energized, inducing electrical eddy currents in nearby conductive objects. The decay of the eddy currents is then detected and measured by the coils. The EM61 generates 150 EM pulses per second and measures the off time between pulses. After each pulse, secondary EM fields are induced briefly in moderately conductive soils, and for a longer time in metallic objects. The EM61 waits between each pulse until the response from the conductive subsurface dissipates, and then measures the prolonged response from buried metal. This response is recorded in millivolts (mV). The EM61 measures multiple time gates (216, 366, 660, and 1,266 microseconds) to provide more informative instrument responses. Due to the EM61 coil arrangement, the response curve has a single well defined positive peak directly over a buried electrically conductive object, which facilitates quick and accurate location of targets. Large electrically conductive objects can generally be detected to a depth of approximately 11 feet below ground surface (bgs).

The EM61 was configured with a Geode DGPS, and collected EM61 data was merged with northing and easting coordinates via a National Marine Electronics Association (NMEA) stream. EM16 data were collected at 0.2 second intervals along transects nominally spaced 5 feet apart over accessible portions of the Site (FIGURE 4). The recorded EM61 data were downloaded to a portable computer in the field for preliminary analysis. Significant EM61 anomalies were marked on the ground surface with marking paint for additional follow-up investigation with the GPR. The Schonstedt GA-52 magnetic locator (magnetic gradiometer) was proposed to be used as an ancillary instrument per the SAP (Tetra Tech 2022a) for additional follow-up investigation to further evaluate the apparent nature and depth of the anomalies. However, it was not used because it was ineffective at distinguishing individual anomaly sources within the extensive surface and subsurface debris areas at the Site, and the magnetometer DGM survey provided digital data to evaluate the extent of magnetic anomalies.

Preprocessing of EM61 DGM data included loading raw data files into DAT61MK2 software and exporting the files to geodetic files. A system time constant of 0.5 second was applied to the data to correct for latency. Geodetic coordinates were converted to North American Datum 1983, State Plane Montana Zone FIPS 2500, meters (the coordinate system requested by EPA on-site). Data files were loaded into Seequent Oasis Montaj software and placed in a dynamically linked database used to plot and review data files for background drift, DGPS dropouts, and data quality. A rolling statistics median filter was applied to the EM61 data to estimate the background drift curves for each data channel or time gate. Background leveling or dedrifting of the data was performed by subtracting the drift curves from each data channel. Channel 3 data were gridded with a 0.25-foot grid cell size and 8-feet blanking distance. Both leveled (background removed) and unleveled (raw) channel 3 data were gridded and analyzed to provide

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more substantiated interpretation of the data. However, the unleveled channel 3 data was found to be most useful.

MAGNETOMETER SURVEY

The G-858 cesium vapor magnetometer detects magnetic anomalies associated with ferrous metal by measuring the strength of total magnetic field along transects. The magnetometer survey was used to detect ferrous metal objects (e.g., USTs, reinforced sumps or vaults, and pipes), buried debris, and underground utility lines. The magnetometer uses an optically pumped cesium vapor sensor and generally has a measurement sensitivity of 0.1 nanoTesla (nT) or 0.1 gamma. The earth's magnetic field is inclined in the direction of the north magnetic pole. Due to this inclination, a buried ferromagnetic object is commonly expressed as a paired anomaly with a positive (above background and slightly to the south) and a negative (above background and slightly to the north) amplitude. Magnitude or amplitude and orientation of a magnetic anomaly depend on material composition, size, shape, depth, and orientation of nearby ferrous metal objects.

Magnetometer data can be susceptible to drift in background readings associated with diurnal variations of the total magnetic field and magnetic storms. Therefore, a base station location at the Site was established away from metallic interferences where stationary readings were recorded with the magnetometer throughout the survey to evaluate diurnal variations in the magnetic field or magnetic storm activity. Solar geomagnetic activity was also checked at the National Oceanic and Atmospheric Administration (NOAA) webpage (http://www.sec.noaa.gov/ftpdir/forecasts) to provide additional assessment of diurnal variations in the Earth's magnetic field. If affected data could not be precisely corrected, then portions of magnetometer data affected by large diurnal magnetic field variances were to be recollected. However, no significant diurnal variances in the magnetic field were measured or noted from the NOAA webpage search, and diurnal corrections to magnetometer data or recollection of magnetometer data were not required.

A dual sensor magnetometer configuration with two magnetometer sensors spaced 5 feet apart was used to collect data at 0.2 second intervals along transects over the Site (FIGURE 5). The magnetometer transects were nominally spaced 10 feet apart over accessible portions of the survey site to provide a nominal 5-feet sensor spacing for the magnetometer data acquired.

Preprocessing of the magnetometer data included loading raw data files into MagMap2000 software and exporting the files into a spreadsheet format. Geodetic coordinates were converted to North American Datum 1983, State Plane Montana Zone FIPS 2500, meters. Data files were loaded into Seequent Oasis Montaj software and brought into a dynamically linked database used to plot and review data files for background drift and data quality. Magnetometer data corrections included removal of data spikes and dropouts, and application of sensor offset correction for the spacing between the cesium vapor magnetometer sensors and the global positioning system (GPS) rover. A rolling statistics median filter was applied to the magnetometer data to estimate the background drift curves for each data set.

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Background leveling or dedrifting of the data was performed by subtracting the drift curves from each data set. The magnetometer data were gridded with a 0.25-foot grid cell size and a 10-foot blanking distance. Both leveled (background removed) and unleveled (raw) magnetometer data were gridded and analyzed to provide more substantiated interpretation of the data. However, the leveled magnetometer data was found to be most useful.

EM31 SURVEY

The EM31 is a frequency domain terrain electrical conductivity meter used to detect changes in subsurface electrical conductivity (such as changes in fill material and backfilled excavations) and EM anomalies associated with larger debris or significant quantities of debris including concrete, asphalt, wood, and buried metal objects (for example, USTs, sumps, and vaults) and underground utility lines. The EM31 can detect both ferrous and non-ferrous metal. The EM31-MK2 consists of a transmitter coil mounted at one end and a receiver coil at the other end of a 12.14-foot-long fiberglass boom. The EM31 measures ground electrical conductivity (quadrature phase component) in milliSiemens per meter (mS/m), and the ratio of the induced secondary magnetic field to the primary magnetic field (in-phase component) in parts per thousand (ppt). The quadrature phase component measures changes in bulk apparent electrical conductivity of the ground surveyed and can detect large or concentrated metallic and non-metallic debris, geologic variations, and changes in electrical conductivity of the soil attributed to clay content, salinity, and moisture. The in-phase component is used to evaluate the presence of large or concentrated metallic debris. The effective depth of exploration for the EM31 in vertical dipole mode can be up to approximately 15 feet bgs, depending on the target size and material, soil, and site conditions.

Vertical dipole mode EM31 data were collected at 0.2 second intervals along transects nominally spaced 5 feet apart over accessible portions of the Site (FIGURE 6 and **FIGURE** 7). The EM31 quadrature phase and in-phase components were calibrated in the field at the Site before data were collected. Preprocessing of the EM31 data included loading raw data files into DAT31W software and exporting the files to geodetic files. A system time constant of 0.5 second was applied to the EM31 data to correct for latency. Geodetic coordinates were converted to North American Datum 1983, State Plane Montana Zone FIPS 2500, meters. Data files were loaded into Seequent Oasis Montaj software and brought in a dynamically linked database used to plot and review data files for background drift, DGPS dropouts, and data quality. A rolling statistics median filter was applied to the EM31 data to estimate the background drift curves for each data set. Background leveling or dedrifting of the data was performed by subtracting the drift curves from each data set. The EM31 data were gridded with a 0.25-foot grid cell size and 8-foot blanking distance. Both leveled (background removed) and unleveled (raw) EM31 data were gridded and analyzed to provide more substantiated interpretation of the data. However, the unleveled quadrature phase data and leveled in-phase data were found to be most useful.

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GROUND PENETRATING RADAR SURVEY

The GPR transmits EM energy into the subsurface from its transducer/antenna. When the transmitted energy reaches a buried object or boundary between materials having different electrical properties (electrical permittivity [dielectric constant] and conductivity), it can be reflected, refracted, or scattered back to the surface. The GPR unit continuously records reflected energy as the transducer/antenna is moved across the ground surface. Greater contrasts in electrical properties result in higher amplitude reflected EM energy. The EM wave travels at a velocity specific to the subsurface electrical properties. Two-way travel times can be converted to depth when EM wave velocities are known or closely estimated from subsurface electrical permittivity and conductivity. GPR subsurface penetration and target resolution are also dependent on subsurface electrical permittivity, conductivity, and antenna frequency. The GPR was used to detect and map possible former excavations, non-metallic underground utility lines, and buried remnants of building foundations formerly occupied by immigrant railroad workers.

GPR traverses were conducted along gridded transects nominally spaced 2 feet apart across accessible portions GPR survey Areas 1 through 3 (possible former immigrant refuge areas) (FIGURE 8 and FIGURE 9). GPR traverses were also conducted along random transects across the main geophysical survey area where access permitted. GPR traverses were not conducted along transects nominally spaced 5 feet apart across accessible portions of the main geophysical area per the SAP (Tetra Tech 2022a) because of extensive access obstructions due to irregular terrain and it provided ineffective resolution of anomalies underlying the extensive surface and subsurface debris areas. GPR traverses were also be performed along arbitrary profiles across detected EM and magnetic anomalies to further evaluate the apparent nature and depth of the anomalies.

RADAN software was be used to process, visualize, and interpret the GPR data and to generate GPR profiles and time/depth slices across the three possible former immigrant refuge areas. GPR data collected along random traverses across the Site and across detected EM and magnetic anomalies to further evaluate the apparent nature and depth of the anomalies were evaluated in real-time.

LINE TRACER SURVEY

Where risers, exposed pipes, or cables (conductors) were present, the RD-8000 line tracer transmitter was connected to the object and a current was impressed on the conductor pipe or cable. The receiver unit, which was tuned to this same frequency, was used to trace the surface projection of pipes away from the riser and/or object. The transmitter and receiver were also used in a non-connect (induction) mode, whereby the transmitter was positioned on the ground and an EM signal was emitted. In the presence of buried metal pipes and wires, a discrete signal was induced on the conductor, which was sensed by the receiver. The instrument was also used in passive mode, whereby radio and 60 Hz EM signals produced by communication and live electric lines are detected. The RD-8000 line tracer instrument was used in passive, direct-connect (e.g., connecting to cut-off pipes and risers), and inductive modes to delineate the presence of underground utilities over the Site.

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3.0 RESULTS AND CONCLUSIONS

The unleveled EM61 DGM survey results are shown on FIGURE 4, and the leveled magnetometer DGM survey results are shown on FIGURE 5. The unleveled EM31 quadrature phase survey results are shown on FIGURE 6 and the leveled EM31 in-phase survey results are shown on FIGURE 7. GPR depth slice data from 1 to 2 feet bgs for GPR Survey Area 1 and GPR Survey Areas 2 and 3 are shown on FIGURE 8 and FIGURE 9, respectively.

The geophysical survey results are as follows:

- The geophysical investigation did not clearly reveal the presence of USTs, backfilled excavations associated with former UST removal, or sumps at the Site. However, several apparent subsurface debris areas or anomaly areas were detected at the Site that may include remnant debris associated with these features or may have masked anomalies associated with these features. Six wood vaults and one pump vault were found and mapped at the surface with DGPS. In addition, four unknown vaults constructed of vertical corrugated metal pipe were observed at the surface and in-line with a detected underground utility line.
- The EM61, magnetometer, and EM31 DGM surveys and line tracer survey detected multiple underground utility lines or other linear features across the Site. Some of the underground lines may be utility lines, drain lines, pipe runs, conduits, or other linear structures, which can act as preferential contaminant migration pathways. Underground lines leading to former locations of USTs and ASTs (such as the oil tank tower) could be former product lines or associated piping, which could be contaminant sources if they have leaked.
- The DGM surveys detected several apparent subsurface debris areas or anomaly areas within the Site totaling 3.5 acres. The apparent subsurface debris areas are associated with areas containing significant surface and subsurface metal debris. The EM61 primarily emphasized smaller and/or shallower ferrous and non-ferrous metal debris, and the magnetometer detected ferrous metals debris and to a greater depth. The EM31 emphasized larger and more concentrated ferrous, non-ferrous, and non-metallic debris. Many of the anomalies within the apparent subsurface debris areas or anomaly areas appear to be associated with scrap metal and construction demolition debris (e.g., reinforced concrete, supports, piping, other metal debris associated with the former railyard) similar to debris observed at the surface. Areas containing higher densities and/or amplitudes of EM and magnetic anomalies were mostly detected in the northern and central portions of the Site where the majority of former Site structures were located. Therefore, many of these anomalies may be associated with construction demolition debris or possible foundation remnants. The GPR data collected over the EM and magnetic anomalies was inconclusive as to the cause or nature of the anomalies. Based on the extent of the apparent subsurface debris areas or anomaly areas delineated from the DGM surveys, the apparent

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subsurface debris areas or anomaly areas may extend beyond the boundaries of Site survey areas.

- The EM31 quadrature phase detected several areas of relatively high electrical conductivity at the Site. These high quadrature phase values (45 mS/m or higher) may be associated with an increase in soil moisture or fines, shallow groundwater, contrast in fill material, and/or contamination. One high electrical conductivity location at the central portion of the Site recently excavated months before the geophysical survey contained saturated soil and free product seepage at the surface at the time of the survey.
- The GPR survey of GPR Survey Area 1 (possible former immigrant refuge area) detected two GPR anomalies that could be associated with backfilled excavations or buried remnants of former dwellings or structures . The GPR anomalies were detected at an approximate depth of 1 to 2 feet bgs. No EM or magnetic anomalies coincided with the GPR anomalies; therefore, the nature of the anomalies is likely non-metallic in origin. No significant or noteworthy GPR anomalies were detected in GPR Survey Area 2 (possible former immigrant refuge area). A GPR anomaly consisting of a series of anomalies in a linear alignment was detected at an approximate depth of 1 to 2 feet bgs at GPR Survey Area 3 (possible former immigrant refuge area). The EM61 and EM31 DGM surveys also detected an apparent subsurface debris area or anomaly area over much of this GPR anomaly. Therefore, the nature and origin of the GPR anomaly is unknown; however, it could be related to former structural foundation posts associated with former dwellings or other remnant structures.

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4.0 RECOMMENDATIONS

Based on the geophysical findings, START V recommends that more direct methods of investigation be conducted to further assess the nature and extent of the features described above. Such proposed methods may include excavation of exploratory trenches, test pits, and soil borings to confirm the source of the anomalies and to evaluate soil for the presence of chemicals of potential concern associated with past Site activities.

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5.0 LIMITATIONS

The geophysical field investigation and analysis in this report have been conducted in general accordance with the current practice and standard of care exercised by consultants performing similar tasks in the project area. No evaluation is detailed enough to reveal every subsurface feature or condition. No warranty (expressed or implied) is made regarding the conclusions and opinions in this report. Variations and conditions not observed or described in this report may be present.

It should be noted that maximum GPR depth penetration ranged from 2 to 3 feet bgs because of soil contents and conditions. Site soils contained moist silty sand and fill materials including metal, concrete, wood, and construction debris. Therefore, objects below the maximum GPR penetration depth would not have been detected with GPR. It should also be noted that existing surface features at the Site (e.g., fences, construction demolition debris, steel reinforced concrete, uneven terrain, trees, and other vegetation) limited the survey coverage and/or interfered with the instrument readings. Subsurface data could not be collected where noted surface obstructions and hazards were present. Additionally, EM and magnetic responses produced by metal surface objects and underground utilities can potentially obscure or mask detection of adjacent or underlying subsurface features. Metal debris and other types of demolition debris interferes with many of the detection methods used. Therefore, buried utilities located below or adjacent to metals or other demolition debris may not have been detectable with the geophysical methods used.

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6.0 REFERENCES

Montana Department of Environmental Quality (MDEQ). 2022. Harlowton's Milwaukee Road Roundhouse and Railyard Transformation. Accessed February 15. https://harlowton-railyard-mtdeq.hub.arcgis.com/

Tetra Tech, Inc. (Tetra Tech). 2020. Quality Assurance Project Plan (QAPP) for U.S. Environmental Protection Agency (EPA) Region 8 Start V Brownfields Task Order. Prepared for EPA Region 8 – Brownfields and Redevelopment Branch. Revision 3. November.

Tetra Tech. 2022a. Sampling and Analysis Plan for Harlowton Railyard Phase II Environmental Site Assessment Geophysical Survey. March.

Tetra Tech. 2022b. Health and Safety Plan for Harlowton Railyard Phase II Environmental Site Assessment Geophysical Survey. March.

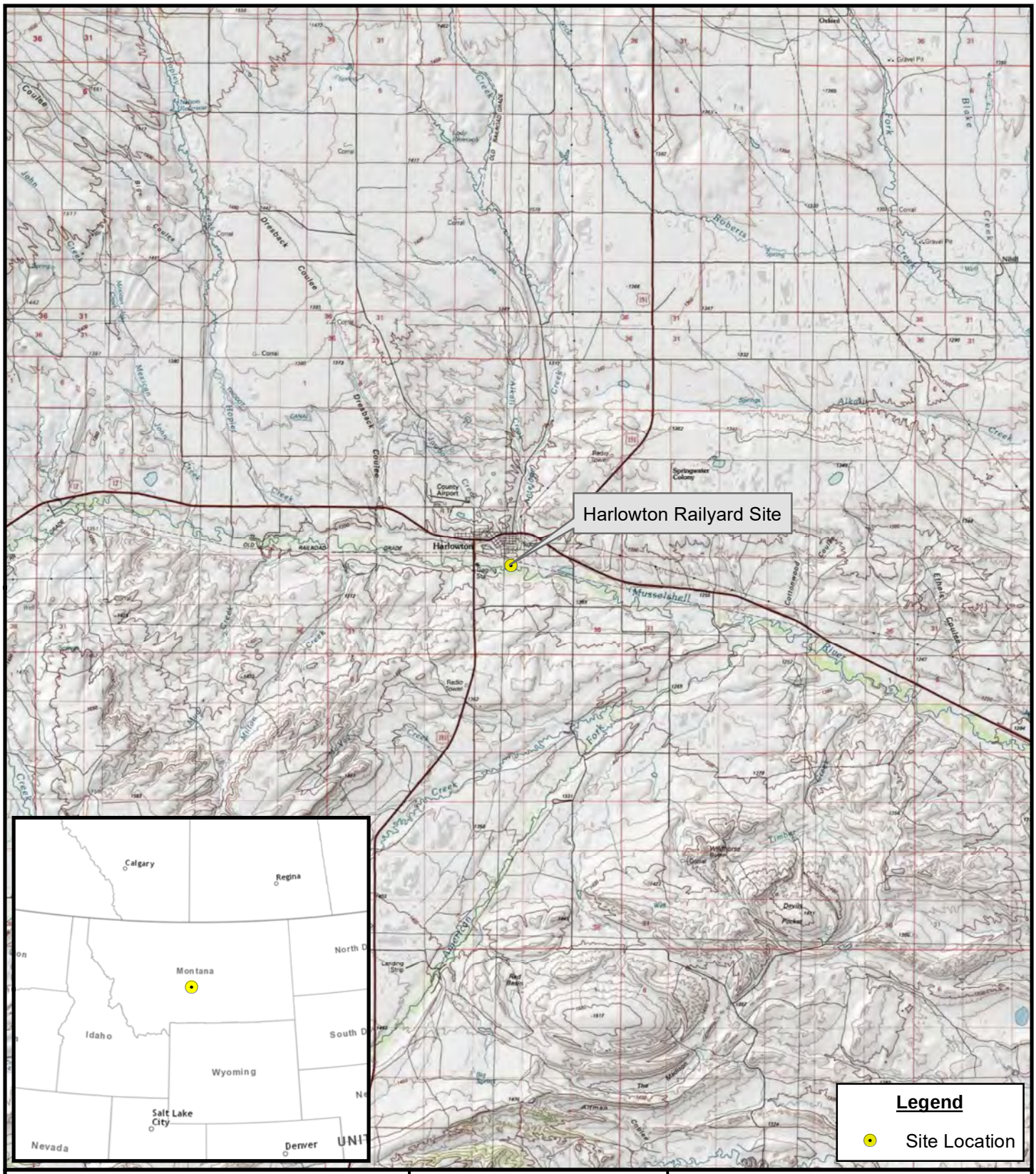
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FIGURES

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FIGURE 1: SITE LOCATION MAP

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Path: V:\Harlowton Railyard TBA Phase II Geophysical Survey\Report Figures\Figure 1_Harlowton Railyard TBA Phase II Geophysical Survey Report Figures - Site Location Map.mxd

Coordinate System: NAD 1983 StatePlane Montana FIPS 2500
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

0 1.5 3 6 Miles

N

Prepared for:
U.S. EPA - Region 8

Contract: 68HE0820D001
TO/TD: 2082-2201-01

Prepared By:
Tetra Tech
825 West Custer Avenue
Helena, MT 59602

FIGURE 1
SITE LOCATION MAP
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

Date: 7/6/2022

DocuSign Envelope ID: 6185EF29-99D5-4197-8018-07020C51D094

FIGURE 2: SITE VICINITY MAP

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Path: V:\Harlowton Railyard TBA Phase II Geophysical Survey\Final Report Figures\Figure 2_Harlowton Railyard - SiteVicinity Map.mxd

Coordinate System: NAD 1983 StatePlane Montana FIPS 2500
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

0 1,000 2,000 4,000 Feet

N

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Helena, MT 59602

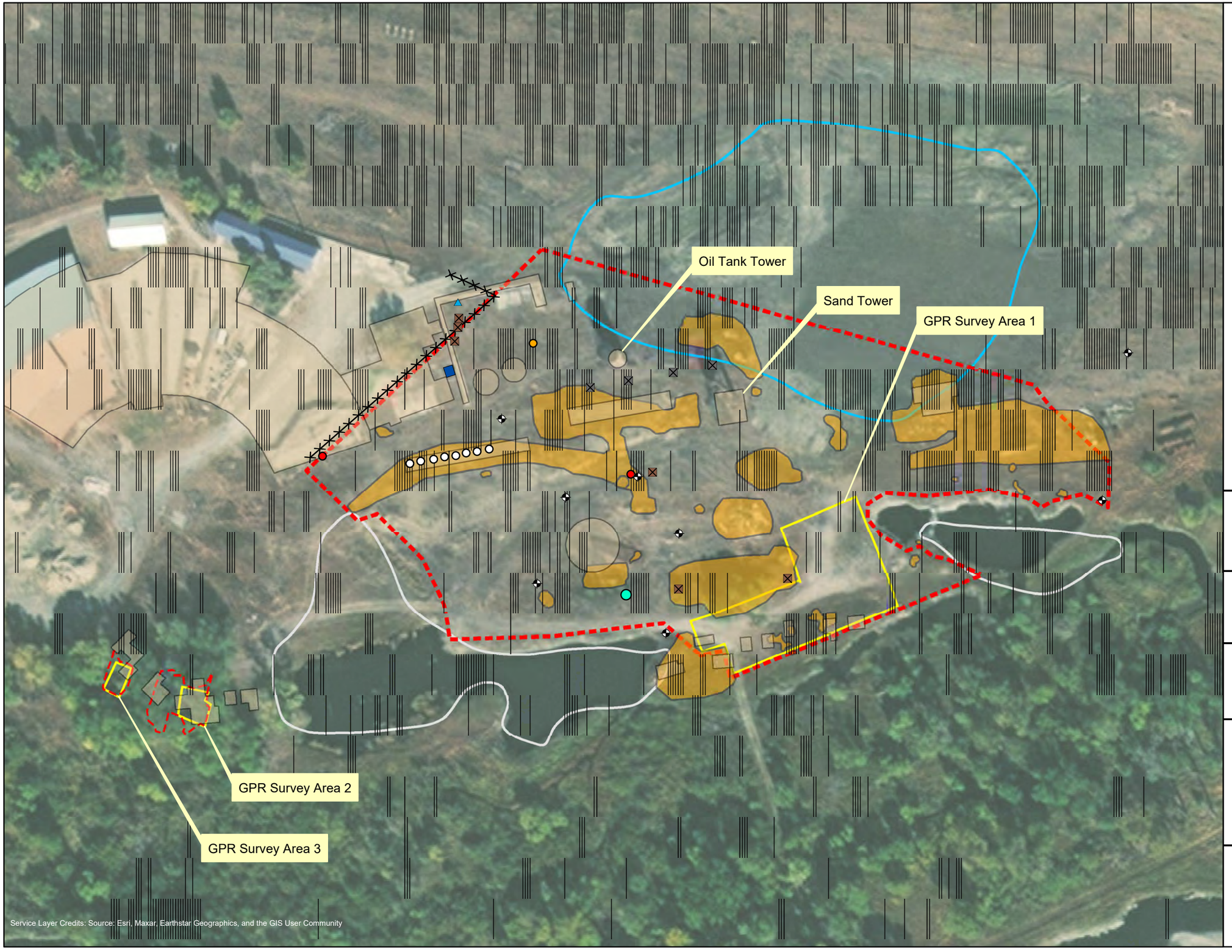
FIGURE 2
SITE VICINITY MAP
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

Date: 7/20/2022

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FIGURE 3: SITE FEATURES MAP

DocuSign Envelope ID: 6185EF29-99D5-4197-8018-07020C51D094



Legend

- Former Structure
- Phase 1 - 2016 Excavation
- Phase 2 - 2019 Excavation
- Geophysical Survey Area
- GPR Survey Area (Possible Former Immigrant Refuge Area)
- Surface Debris Area
- Pump Vault
- Wood Vault
- Unknown Vault
- Fire Hydrant
- Utility Pole
- Vertical Steel Beam
- Cutoff Pipe
- Monitoring Well
- Manhole
- Fence

Note: GPR - Ground Penetrating Radar

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Coordinate System: NAD 1983 StatePlane Montana FIPS 2500 Meters
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

N

0 25 50

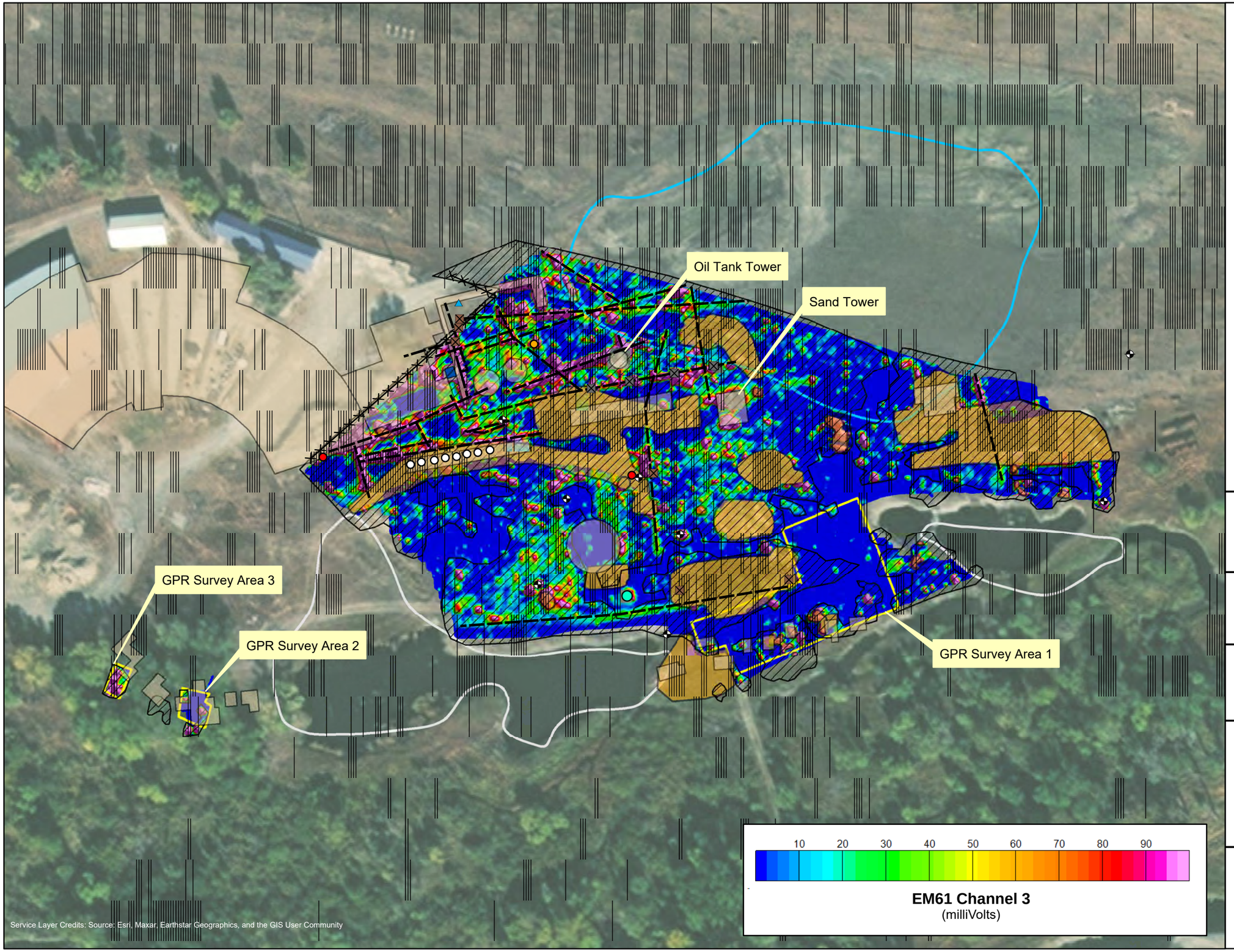
Meters

FIGURE 3
SITE FEATURES MAP
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

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FIGURE 4: EM61-MK2 SURVEY RESULTS

DocuSign Envelope ID: 6185EF29-99D5-4197-8018-07020C51D094



Legend

- Former Structure
- Phase 1 - 2016 Excavation
- Phase 2 - 2019 Excavation
- GPR Survey Area (Possible Former Immigrant Refuge Area)
- Surface Debris Area
- Apparent Subsurface Debris Area or Anomaly Area
- Pump Vault
- Wood Vault
- Unknown Vault
- Fire Hydrant
- Utility Pole
- Vertical Steel Beam
- Cutoff Pipe
- Monitoring Well
- Manhole
- Fence
- Underground Utility Line or Other Linear Feature

Note: GPR - Ground Penetrating Radar

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Helena, MT 59602

Coordinate System: NAD 1983 StatePlane Montana FIPS 2500 Meters
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

N

0 25 50

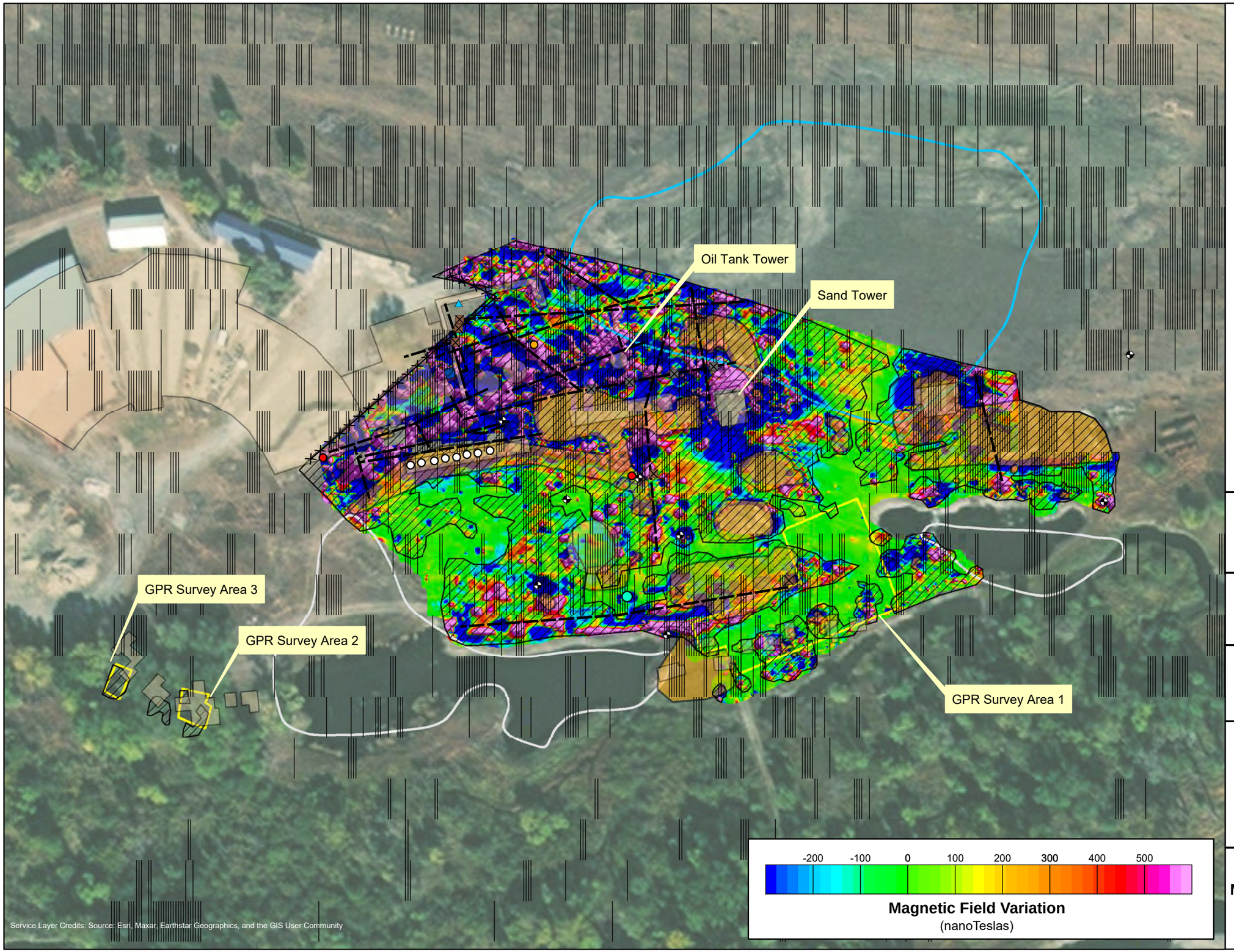
Meters

FIGURE 4
EM61-MK2 SURVEY RESULTS
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

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FIGURE 5: MAGNETOMETER SURVEY RESULTS

DocuSign Envelope ID: 6185EF29-99D5-4197-8018-07020C51D094



Legend

- Former Structure
- Phase 1 - 2016 Excavation
- Phase 2 - 2019 Excavation
- GPR Survey Area (Possible Former Immigrant Refuge Area)
- Surface Debris Area
- Apparent Subsurface Debris Area or Anomaly Area
- Pump Vault
- Wood Vault
- Unknown Vault
- Fire Hydrant
- Utility Pole
- Vertical Steel Beam
- Cutoff Pipe
- Monitoring Well
- Manhole
- Fence
- Underground Utility Line or Other Linear Feature

Note: GPR - Ground Penetrating Radar

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Coordinate System: NAD 1983 StatePlane Montana FIPS 2500 Meters
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

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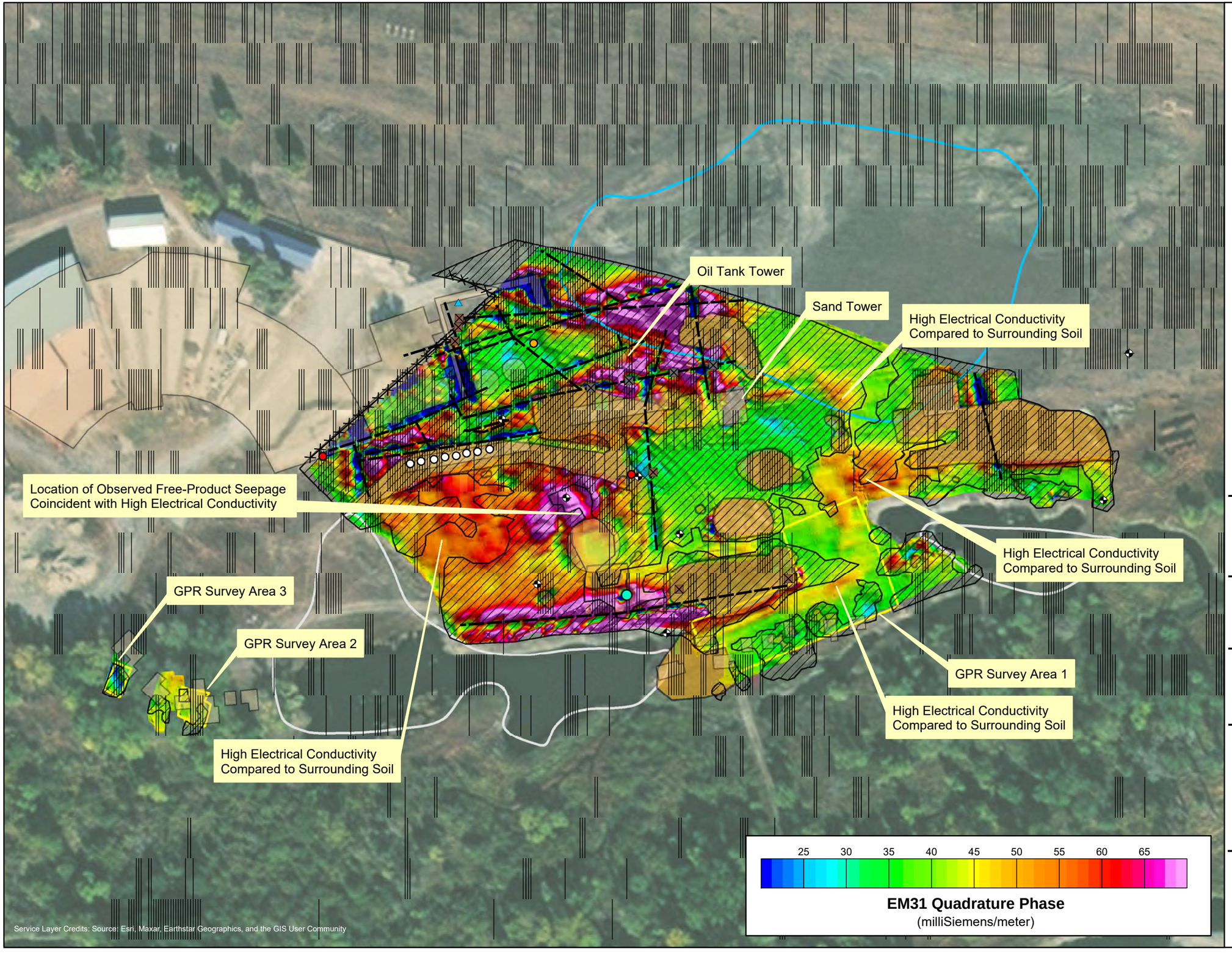
Meters

FIGURE 5
MAGNETOMETER SURVEY RESULTS
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

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FIGURE 6: EM31-MK2 QUADRATURE PHASE SURVEY RESULTS

DocuSign Envelope ID: 6185EF29-99D5-4197-8018-07020C51D094



Legend

- Former Structure
- Phase 1 - 2016 Excavation
- Phase 2 - 2019 Excavation
- GPR Survey Area (Possible Former Immigrant Refuge Area)
- Surface Debris Area
- Apparent Subsurface Debris Area or Anomaly Area
- Pump Vault
- Wood Vault
- Unknown Vault
- Fire Hydrant
- Utility Pole
- Vertical Steel Beam
- Cutoff Pipe
- Monitoring Well
- Manhole
- Fence
- Underground Utility Line or Other Linear Feature

Note: GPR - Ground Penetrating Radar

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Coordinate System: NAD 1983 StatePlane Montana FIPS 2500 Meters
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

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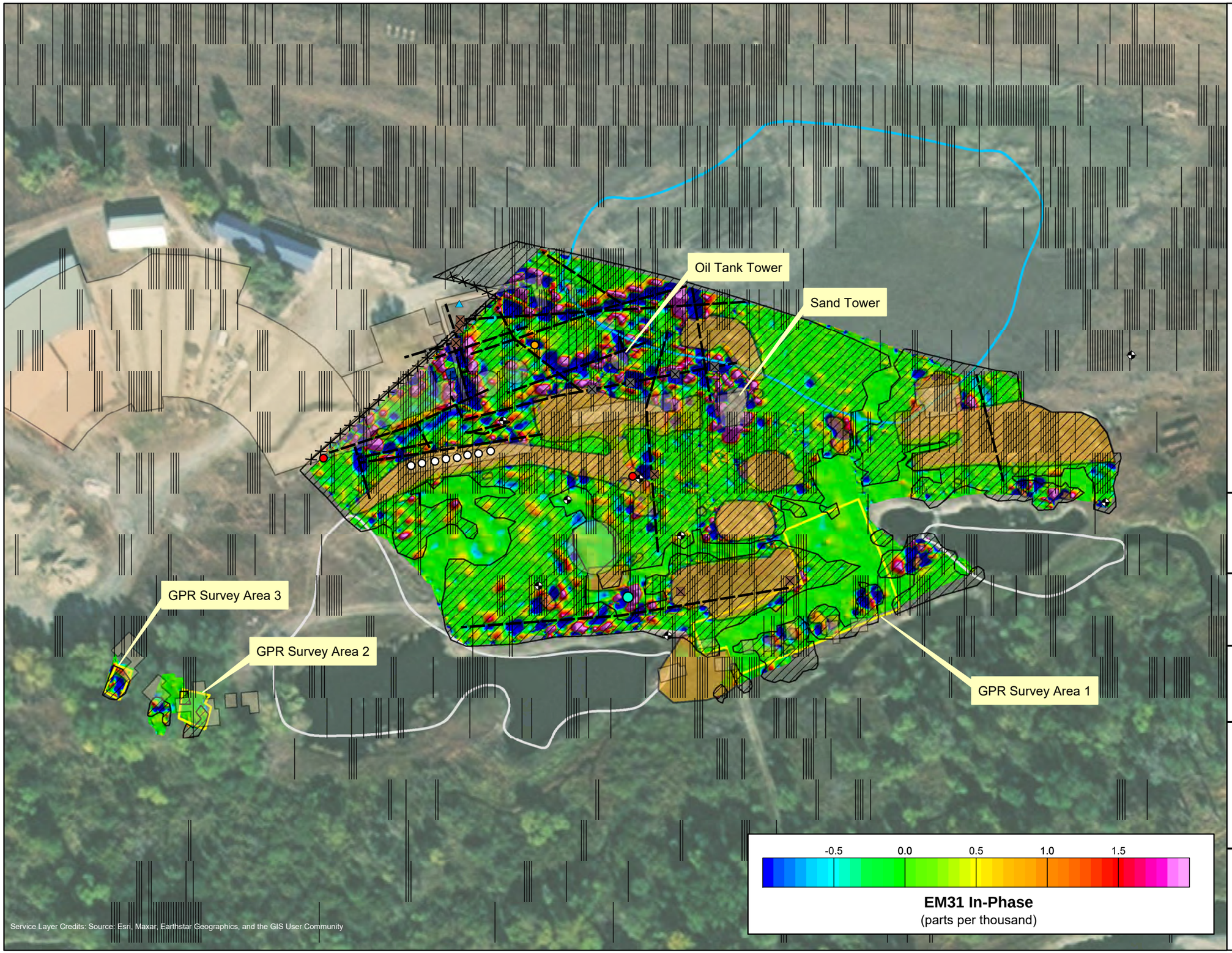
0 25 50
Meters

FIGURE 6
EM31-MK2 QUADRATURE PHASE SURVEY RESULTS
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

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FIGURE 7: EM31-MK2 IN-PHASE SURVEY RESULTS

DocuSign Envelope ID: 6185EF29-99D5-4197-8018-07020C51D094



Legend

- Former Structure
- Phase 1 - 2016 Excavation
- Phase 2 - 2019 Excavation
- GPR Survey Area (Possible Former Immigrant Refuge Area)
- Surface Debris Area
- Apparent Subsurface Debris Area or Anomaly Area
- Pump Vault
- Wood Vault
- Unknown Vault
- Fire Hydrant
- Utility Pole
- Vertical Steel Beam
- Cutoff Pipe
- Monitoring Well
- Manhole
- Fence
- Underground Utility Line or Other Linear Feature

Note: GPR - Ground Penetrating Radar

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U.S. EPA - Region 8

Contract: 68HE0820D001
TO/TD: 2082-2201-01

Prepared By:
Tetra Tech
825 West Custer Avenue
Helena, MT 59602

Coordinate System: NAD 1983 StatePlane Montana FIPS 2500 Meters
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

N

0 25 50

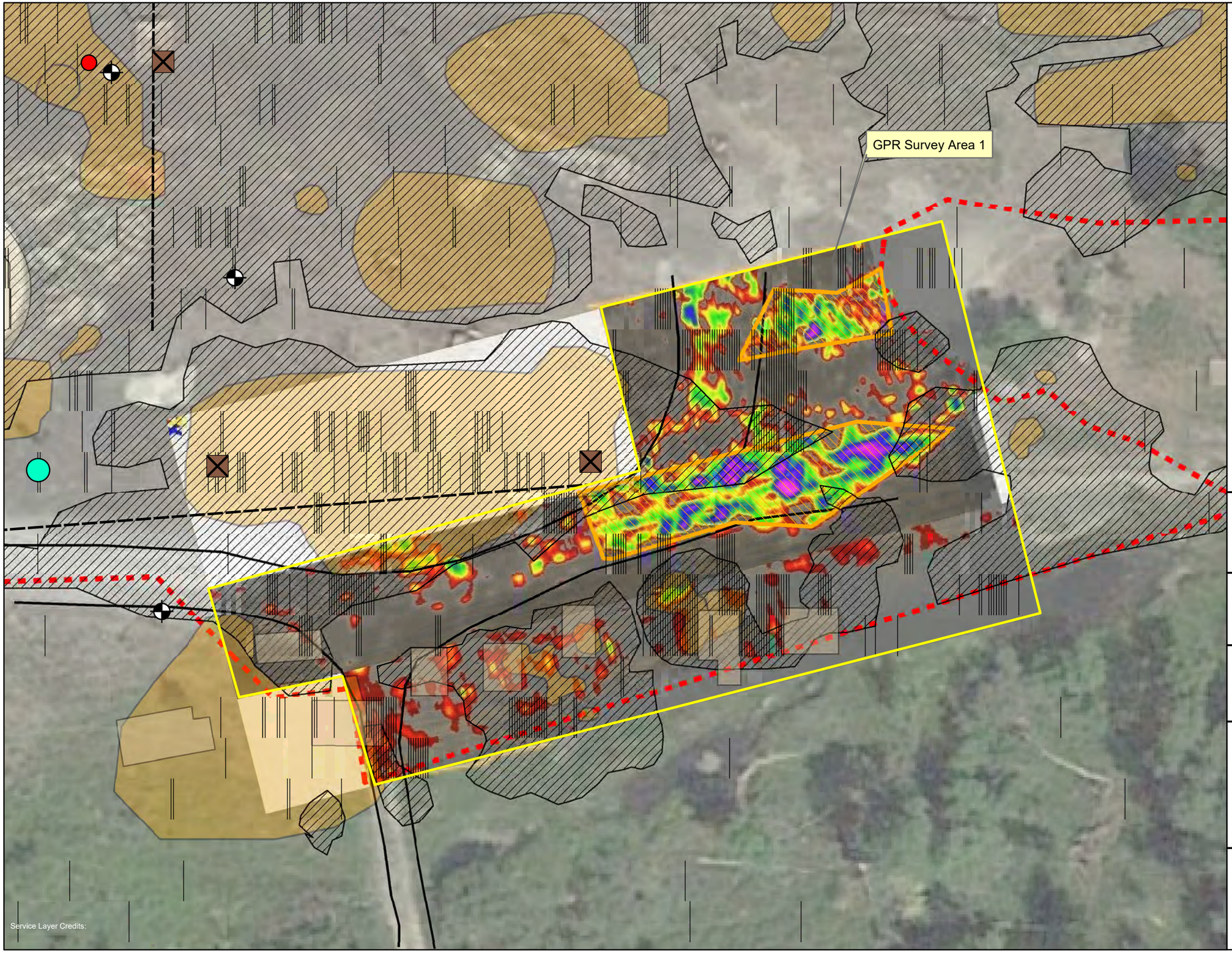
Meters

FIGURE 7
EM31-MK2 IN-PHASE SURVEY RESULTS
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

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FIGURE 8: GPR SURVEY AREA 1 RESULTS

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Legend

- Geophysical Survey Area (approximate)
- GPR Survey Area (Possible Former Immigrant Refuge Area)
- Former Structure
- Surface Debris Area
- Apparent Subsurface Debris Area or Anomaly Area (Detected by EM and/or Magnetometer Surveys)
- GPR Anomaly
- Wood Vault
- Monitoring Well
- Utility Pole
- Manhole
- Dirt Road
- Underground Utility Line or Other Linear Feature

Notes: EM - Electromagnetic
GPR - Ground Penetrating Radar

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U.S. EPA - Region 8

Contract: 68HE0820D001
TO/TD: 2082-2201-01

Prepared By:
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Coordinate System: NAD 1983 StatePlane Montana FIPS 2500 Meters
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

N

0 5 10 20
Meters

FIGURE 8
GPR SURVEY AREA 1 RESULTS
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

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FIGURE 9: GPR SURVEY AREAS 2 AND 3 RESULTS

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Legend

- Geophysical Survey Area (approximate)
- GPR Survey Area (Possible Former Immigrant Refuge Area)
- Former Structure
- Apparent Subsurface Debris Area or Anomaly Area (Detected by EM Surveys)
- GPR Anomaly
- Dirt Road

Notes: EM - Electromagnetic
GPR - Ground Penetrating Radar

Prepared for:
U.S. EPA - Region 8

Contract: 68HE0820D001
TO/TD: 2082-2201-01

Prepared By:
Tetra Tech
825 West Custer Avenue
Helena, MT 59602

Coordinate System: NAD 1983 StatePlane Montana FIPS 2500 Meters
Projection: Lambert Conformal Conic
Datum: North American 1983

Source:
Background: ESRI World Imagery (2021)

N

0 5 10 20
Meters

FIGURE 9
GPR SURVEY AREAS 2 & 3 RESULTS
HARLOWTON RAILYARD SITE
HARLOWTON, MONTANA

DocuSign Envelope ID: 6185EF29-99D5-4197-8018-07020C51D094

APPENDIX A: PHOTOGRAPHIC DOCUMENTATION

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APPENDIX A: PHOTOGRAPHIC DOCUMENTATION
Phase II Environmental Site Assessment Geophysical Survey
Harlowton Railyard
Harlowton, Montana



Photo B-1: View looking west at EM61 digital geophysical mapping (DGM) data collection at the northwest portion of the main geophysical survey area.



Photo B-2: View looking southeast at EM61 DGM data collection at the central portion of the main geophysical survey area.

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Photo B-3: View looking east at G-858 cesium vapor magnetometer dual-sensor DGM configuration at the western portion of the main geophysical survey area. The oil tank tower, sand tower, and surface debris areas are in the background.



Photo B-4: View looking east at EM31 DGM data collection at the eastern portion of the main geophysical survey area. Surface debris areas containing removed tanks and scrap metal and wood debris in the laydown area are in the background.

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Photo B-5: View looking east at ground penetrating radar (GPR) data collection at the central portion of the main geophysical survey area.



Photo B-6: View looking southeast at surface feature mapping with a differential global positioning system (DGPS) at the east portion of the main geophysical survey area. Surface debris areas and the pond (Phase 1 – 2016 excavation) are in the background.

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Photo B-7: View looking northwest at an exposed retaining wall and surface debris area at the western portion of the main geophysical survey area. Possible drain or other pipe openings are delineated by pink markings.



Photo B-8: View looking east along the surface debris area and retaining wall at the western portion of the main geophysical survey area. Partially uncovered vertical steel beam supports are shown sticking out of the ground along the northern side of the retaining wall.

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Photo B-9: View looking northwest along the surface debris area at the western portion of the main geophysical survey area.



Photo B-10: View looking northwest at a pipe sticking out of the ground west of the retaining wall in the western portion of the main geophysical survey area.

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Photo B-11: View looking east at the footprint of the former machine shop and surface debris areas at the northwest boundary of the main geophysical survey area.



Photo B-12: View looking east at a metal plate and foundation in the northwest portion of the main geophysical survey area. Surface debris areas are in the background.

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Photo B-13: View looking northeast at a concrete pad at the northwest portion of the main geophysical survey area. The pink markings delineate an underground utility line detected with the line tracer.



Photo B-14: View looking east at the pump vault in the northwest portion of the main geophysical survey area.

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Photo B-15: View inside the pump vault at the northwest portion of the main geophysical survey area.



Photo B-16: View looking north at open wood vaults (fall hazards) along the northwestern boundary of the main geophysical survey area.

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Photo B-17: View inside a wood vault at the northwestern boundary of the main geophysical survey area.



Photo B-18: View looking east at a cutoff pipe (possible former well) in the northern portion of the main geophysical survey area. The cutoff pipe contains water and is covered by a piece of sheet metal.

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Photo B-19: View looking south at the oil tank tower at the northern portion of the main geophysical survey area. The pink markings delineate an underground utility line detected with the line tracer.



Photo B-20: View looking northwest at a pipe opening on the south side of the oil tank tower at the northern portion of the main geophysical survey area.

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Photo B-21: View looking east along an underground utility line (delineated by pink markings) detected with the line tracer just south of the oil tank tower at the northern portion of the main geophysical survey area. Surface debris areas are in the background.



Photo B-22: View looking west along an underground utility line (delineated by pink markings) detected with the line tracer southeast of the oil tower at the northern portion of the main geophysical survey area. Surface debris areas are in the background.

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Photo B-23: View looking east at an unknown vault and underground utility line (delineated by pink markings) detected with the line tracer southeast of the oil tower at the northern portion of the main geophysical survey area. Surface debris areas are in the background.



Photo B-24: View looking southeast at a broken portion of a pipe at the eastern portion of the main geophysical survey area. The pond (Phase 1 – 2016 excavation) is in the background.

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Photo B-25: View looking west at a corrugated metal pipe unknown vault (fall hazard) and old foundation at the northern portion of the main geophysical survey area.



Photo B-26: View inside a corrugated metal pipe unknown vault at the northern portion of the main geophysical survey area.

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Photo B-27: View looking west at a wood vault on the east side of the surface debris area at the southern portion of the main geophysical survey area (directly north of GPR Survey Area 1).



Photo B-28: View looking west at a wood vault on the west side of the surface debris area at the southern portion of the main geophysical survey area (directly north of GPR Survey Area 1).

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Photo B-29: View inside the wood vault on the west side of the surface debris area at the southern portion of the main geophysical survey area (directly north of GPR Survey Area 1).



Photo B-30: View looking northwest at surface debris areas (removed wood and scrap metal debris stockpiles) in the laydown area at the eastern portion of the main geophysical survey area.

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Photo B-31: View looking northwest at surface debris areas containing removed scrap metal debris and tanks in the laydown area at the eastern portion of the main geophysical survey area.



Photo B-32: View looking southwest at surface debris areas containing removed tanks and scrap metal debris in the laydown area at the eastern portion of the main geophysical survey area.

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Photo B-33: View looking southeast at GPR data collection at GPR Survey Area 1.



Photo B-34: View looking southeast at EM31 DGM data collection over the geophysical survey area overlapping GPR Survey Area 1.

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Photo B-35: View looking southwest at the southern portion of GPR Survey Area 1.



Photo B-36: View looking southwest at GPR data collection at GPR Survey Area 2.

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Photo B-37: View looking east at EM31 DGM data collection over the geophysical survey area overlapping GPR Survey Area 2.



Photo B-38: View looking south at GPR data collection at GPR Survey Area 3.

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Photo B-39: View looking south at the south side of GPR Survey Area 3.

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Small Scale Inventory Report Form
For DEQ Projects in Montana

1. ORG/Report Number: (DEQ Only) 503484109

2. Department/Section: (i.e., EMB/Hard Rock) Remediation

3. Report Title (Project Title): Harlowton Wetlands Remediation Project Cultural Resource Inventory, Wheatland County, Montana.

4. Field Work Date(s): 6/9/2020

6. Consultant Name & Address
Name: DEQ
Address: 1520 E 6th Ave Helena MT.
Author's Name: James D. Strait
Field Personnel:
Phone: 406-444-6765

7. ACREAGE:
Total No. of acres surveyed: 7
Surface Ownership: City of Harlowton
State:
Private:

Block Survey: 7
Linear Survey:

8. Sponsor Name and Address
DEQ Remediation
Name: Jason Seyler
Address: DEQ Cedar Street building
Phone: (406) 444-6447

9. Location (map attached)
State: MT
County: Wheatland
Legal Location: T8N R15E Sec 27 NE 1/4

10. Records Search
CRIS/CRABS Date: 6/17/2020: 2020061703
Other: Type & Date:
List sites within ¼ mile of project: 24WL0098, 24WL0128

11. Environmental Setting: The majority of the site is considered to be comprised of the Fairway-Meadowcreek-Soapcreek complex, 0 to 2 percent slopes, rarely flooded soil map unit (SMU 135) (NRCS 2018). These soils are typically found on floodplains, and as typical in floodplain settings, are comprised of a wide variety of soil textures that can range from sandy loam, loam and silt loam to finer textures such as clay loams and silty clay.

Description of Undertaking: The Harlowton Milwaukee Roundhouse operated as a railroad locomotive repair and refueling station from 1900 to 1979. Milwaukee's operation of the site resulted in soils and underlying groundwater being contaminated with diesel. The site was determined to be a brownfield site in 1997, and is currently being remediated. The City of Harlowton has expressed interest in the site being restored to natural floodplain habitats, including riparian cottonwood and shrubs, upland grasslands, bulrush and cattail marsh, and sedge meadows (Figure 1). Extensive earth moving has already taken place, as there was no applicable state or federal cultural oversite of the remediation work prior to the consideration of the development of wetlands, which brought in the attention of the Corps of Engineers (COE). However, consultation with local city officials and citizens has been ongoing and has identified a desire to preserve some of the District features.

13. Field Methods: The area was inventoried using 20 meter transects across the project area. Additionally, aerial imagery was created using a DJI Inspire 1 Pro Unmanned Aerial System (UAS) on a separate date. The day of inventory was sunny and windy, with temperatures in the low 90s. The Milwaukee Railroad Museum was visited to examine files and photographs available for interpretation.

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14. Cultural Resource Summary/Monitoring Results/Finding of Effects:

Two previously identified sites were in or near the project area. Site 24WL0128 is the Harlowton-Great Falls Branch of the Milwaukee Railroad. After thorough examination of aerial imagery and ground examination, it became clear that 24WL0128 and any associated elements were not within the current project area so was not updated. The second site and the focus of this report is the National Register of Historic Places (NRHP) listed Milwaukee Railroad Historic District (24WL0098).

Site 24WL0098 Milwaukee Railroad Historic District
A detailed history of the Railroad exists within the NRHP nomination form and other resources, so will not be repeated here. The district was listed in 1988 without the establishment of an official site form. The district lists 11 features, with 10 identified as contributing elements. Of the 10 contributing elements, only the Roundhouse, Depot Yard Masters Office, Well House, and Used Oil Tank remain. The current wetland remediation project boundaries will only affect the Used Oil Tank, Well House and the non-contributing Sand Tower.

Existing Associated Features in Project Area
The Used Oil Tank (also named "Oil Tank", which is listed as a water tank on early engineering schematics) is an octagonal brick base topped by steel tower (Figure 2). The base measures 15.5 feet in diameter. The brick base measures 25 feet tall, with the steel tank measuring an additional 18.5 feet tall. A 1 foot thick concrete pad separates the two and forms a brief lip in the structures outline. There are doorways facing east and west, each measuring 6.5 feet tall by 3 feet wide. The conical metal (steel?) roof extends an additional 1.5 feet above the tank. This feature is still in very good condition and is still considered a contributing element to the NRHP listed status of the District.

The existing Sand Tower, which was used for loading sand onto the rail cars, is a metal structure that replaced the original wooden structure in 1955 (Figure 3). A physical description is difficult, but it is a large metal lattice made up of two sections. One section contains the sand tank and access structure, with a base that measures approximately 16 feet north-south by 14.5 feet east-west. The second section is also metal lattice, that extends across what was once two different rail tracks. This section measures 30 feet north-south by 10 feet east-west. Since it is a replacement of the previous wood structure, it is a non-contributing element to the District NRHP status.

The Well House (aka Hose House 1926, Figure 4) is a low walled 10.5-foot square foundation structure with a 10-foot square sloped wooden cover or "roof". The north side of the roof walls are approximately 1 inches in height, with an additional 1 inch lip of the roof cover. The south side of the roof has a 1 foot tall wall, providing a sloped roof with a north facing aspect. On the top of the roof are two access portals. The central portal measures 3-foot square and is covered. The second portal is open and measures 2.7 feet east-west by 2 feet north south. This structure is listed as a contributing element to the District NRHP status. Time and neglect have impacted the wood portion of this structure, though it is still mostly intact.

Additional Features
There remains a series of concrete foundations in the vicinity of the Well House (Areas A, B and C Figure 5). Area A consists of the concrete foundation remnants of the roundhouse bays 1-5. There are no remaining elements of the Turntable. The foundations outlined in Area B are the remains of several attached shops and connecting sidewalk (Figure 5, see also the attached site form). These shops consisted of an Engine Mens Room, Round House Office, RH store Department, Black Smith Shop, boiler room, Power House, Air Room, Machine Shop, Toilets, SW Lunch Room, and Water Treatment. Historic documents indicate that Area C was a loading platform (Figure 5). None of these features retain sufficient integrity to be considered contributing to the NRHP status of the district.

Additionally, there is a side note that extends beyond the project area. It is noted in a set of blueprints from 1940 (Figure 6), a series of dwellings once existed south and east of the roundhouse. The houses to the south were the dwellings of some employees at the facility including: the Manita, Takashi, Sataki, Yamamoto, Miush. Further to the east were several homes, all belonging to the Pucih Family. Though most of these structures do not exist today due to actions of the Musselshell River, (some of the Pucih structures or foundations may still exist), the apparent ethnic and special separation of some families during the period of operation would make an interesting avenue of inquiry.

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Integrity:
When the railroad shut down in 1988, much of the original track, associated structures and line beds were removed. Some of the line bed remnants remain, but not where the current project is located. The area where the wetland restoration is located would have once been part of a larger industrial view shed, but the elements that may have retained that industrial feeling have long been removed. Although the proposed wetlands work in the east area of the district would result in some loss of visual integrity, the loss would be minor and not significantly impact the significance of the district.

The elements that contribute to the NRHP listing of 24WL0098 examined here still retain integrity of location, design, materials association and workmanship. Integrity of setting and feeling for the site as a whole has long been lost, but this has minimal effect to the overall integrity of the district.

15. Management Summary/Recommendations

The intent of the project is to preserve the Old Oil Tank, Well House and Sand Tower in place. Protective measures will be utilized, such as fencing and avoidance of the Well House and Old Oil Tank. DEQ archaeologist will be on-site when needed, and make occasional visits to the site to ensure those structures remain intact. Additional preservation options are currently under review, including stabilization and interpretive signing. Rehabilitation and repurposing efforts of the remaining portion of the Round House are under development, though those efforts are separate from the scope of this current project. Any such additional measures will be submitted to SHPO for comment before they are approved.

The proposed wetland remediation project will have no adverse effect on this NRHP listed Historic Property. Cultural Resource clearance is recommended.

References:
National Register of Historic Places Nomination form for 24WL0098
Milwaukee Rail Road Museum, Harlowton MT.

16. Certification

I certify the information provided in this report is correct, accurate and meets all applicable State standards.

_____	November 12, 2020
Signature	Date

Include these items with the report:
1:24,000 topographic map, photograph or digital image of the project area, associated forms as needed.

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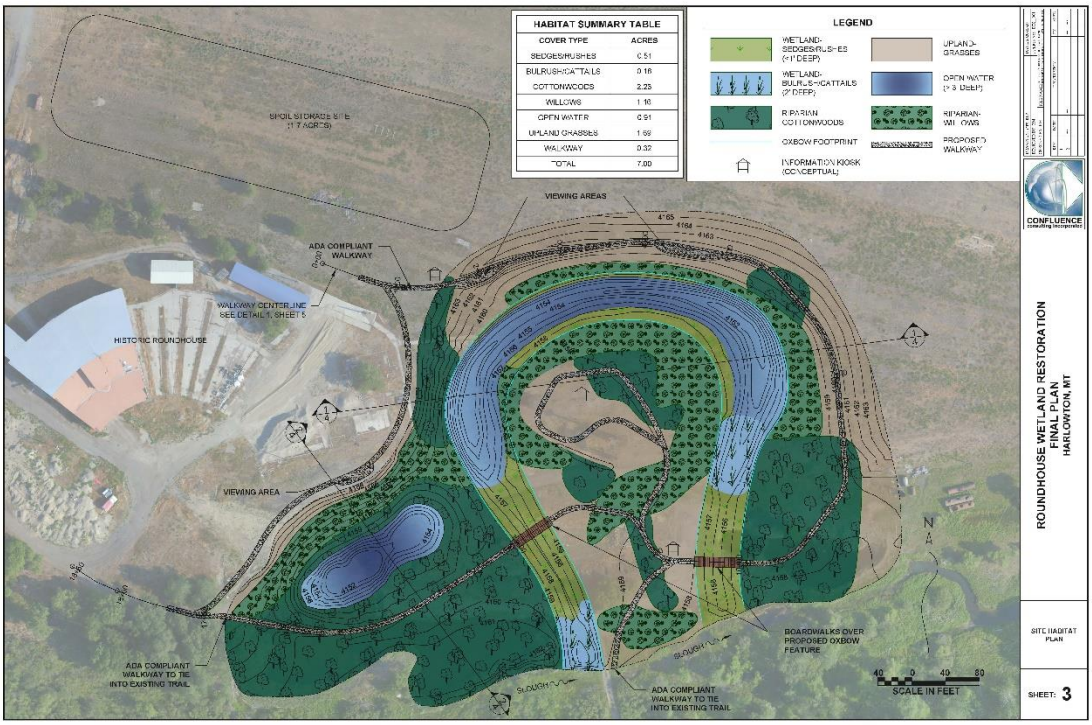


Figure 1: Project Area



Figure 2: Old Oil Tank

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Figure 3: Sand Tower



Figure 4: Well House

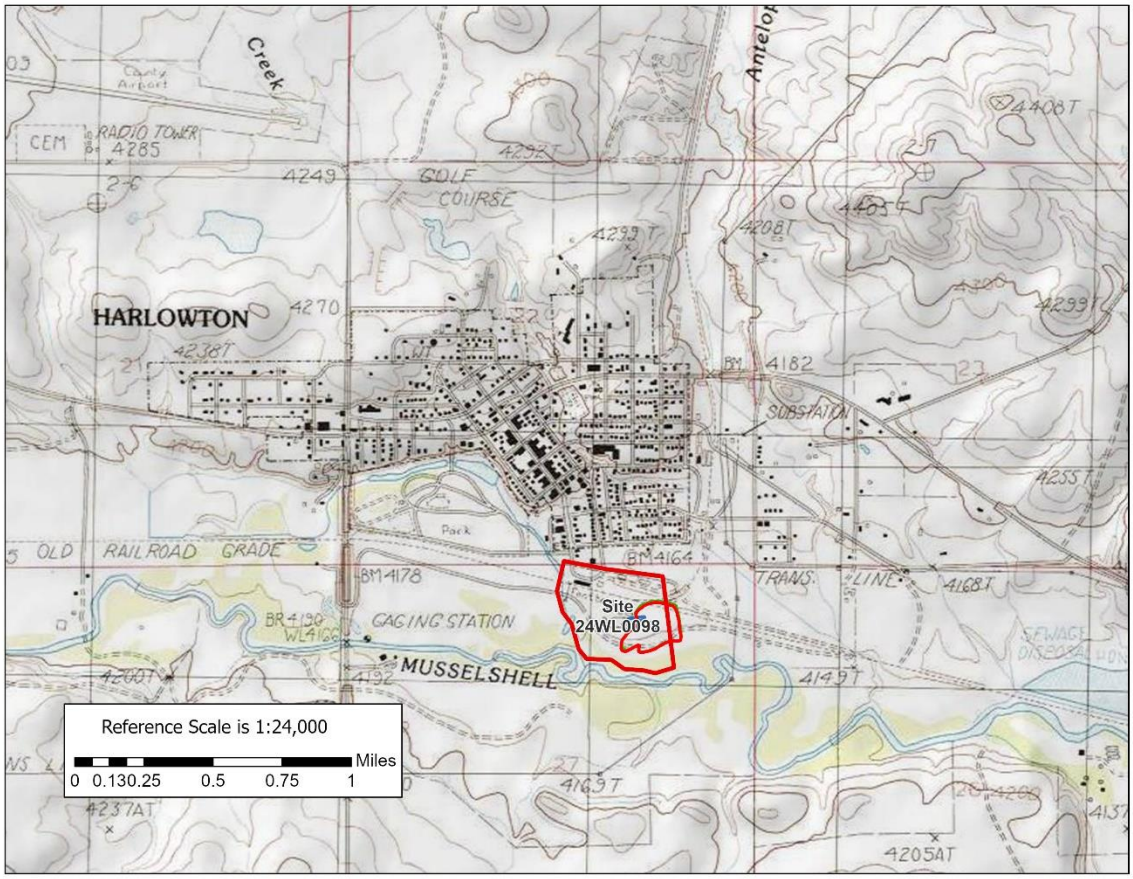
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Figure 5: Aerial view of Project Area

Figure 6. 1940's schematic showing residence locations.

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1:24000 Scale Map of Project Area.

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DEQ
Montana Department of Environmental Quality

May 31, 2023

Laura Marsh
Montana State Historic Preservation Office
225 North Roberts
PO Box 201201
Helena, MT 59620

RE: Milwaukee Railroad Historic District Update.

Dear Laura,

The Montana Department of Environmental Quality (DEQ) along with assistance from the Environmental Protection Agency (EPA) is in the process of remediating contaminated soils and certain structures at the National Register of Historic Places (NRHP) listed Site 24WL0098, the Milwaukee Railroad Historic District. This District is currently eligible under Criteria A and C.

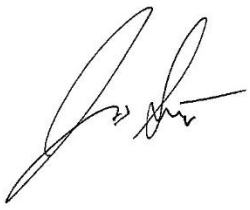
While conducting archival research into the site, evidence was found that indicated the presence of a Japanese immigrant community on the property (Strait 2020). In 2022, the EPA sponsored a geophysical examination of the site area (Tetra Tech 2022), primarily looking for additional buried tanks and other contaminants. During this work, DEQ requested an examination of suspected foundation locations associated with the Japanese community. The results of the geophysical indicated a strong positive result for buried features that closely corresponds with known domestic structures. Based on this evidence, DEQ asserts that this new information now qualifies the District as eligible under Criterion D. DEQ request concurrence with this finding.

A Programmatic Agreement and mitigation plan is in development to address ongoing and potential impacts at the site, which is planned to include excavations, historic archival research and public interpretive signage for the end of project development.

Please find the attached 24WL0098 Site Form Update, along with a copy of the Tetra Tech (2022) geophysical report (Attachment A).

If you have any questions or concerns regarding the update or associated documents, please feel free to contact me at your convenience.

Sincerely,



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James D. Strait, RPA
Montana Department of Environmental Quality
Tribal and Cultural Resources Officer
1520 East 6th Ave.
PO Box 200901,
Helena, MT 59620-0901
jstrait@mt.gov
(406) 444-6765

Refernces

Strait, James
2022 Harlowton Wetlands Remediation Project Cultural Resource Inventory, Wheatland County, Montana.

Tetra Tech
2022 Phase II Environmental Site Assessment Geophysical Survey Report. Superfund Technical Assessment and Response Team (START) V Contract No. 68-HE-0820-D0001, Prepared for the US Environmental Protection Agency, Denver.

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MONTANA HISTORICAL SOCIETY

Montana State Historic Preservation Office
225 N. Roberts St.
P.O. Box 201201 Helena,
MT 59620-1201

406-444-7715

June 16, 2023

Mr. James Strait
Montana Department of Environmental Quality
1520 East 6th Ave
P.O. Box 200901
Helena, MT 59620-0901

RE: Milwaukee Railroad Historic District Update
Wheatland County, Montana

Dear Mr. Strait:

Thank you for the letter and cultural resource form (received June 5, 2023) regarding the Milwaukee Railroad Historic District Update. We concur that cultural resource 24WL0098 is Eligible under Criterion D.

If you have any questions or concerns, do not hesitate to contact me at (406)444-0388 or JBush2@mt.gov. Thank you for consulting with us.

Sincerely,

Jessica Bush

Jessica Bush, M.A.
State Archaeologist, Deputy SHPO
Montana State Historic Preservation Office

File: DEQ - 2023 - 2023060509

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MONTANA HISTORICAL SOCIETY

Montana State Historic Preservation Office
225 N. Roberts Ave.
P.O. Box 201201
Helena, MT 59620-1201

406-444-7715

June 2, 2023

Mr. Greg Davis
Brownfields Project Manager
EPA
1595 Wynkoop St.
Denver, CO 80202-1129

Ref: Finding of Adverse Effect for Cleanup of the Milwaukee Road Historic District (24WL0098), Harlowton

Dear Mr. Davis:

Thank you for providing the Montana State Historic Preservation Office (SHPO) with information on the above referenced undertaking. SHPO concurs with the EPA on the EPA's determination of adverse effects associated with the undertaking.

SHPO looks forward to resolving the draft Programmatic Agreement (PA) we've worked on with you, and we look forward to the meaningful mitigation measures outlined in it.

Sincerely,

State Historic Preservation Officer

File: EPA-Harlowton-2023053108

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region08

March 14, 2023

Ref: LCR-BR

Eric Newcombe
Historic Architecture Specialist
Montana State Historic Preservation Office
Box 201202
Helena, Montana 59620

RE: NHPA Section 106 Consultation on Adverse Effect Determination – Harlowton Roundhouse and Railyard - Milwaukee Road Historic District (NAID: 71976655), 308 A Ave S, Harlowton, MT 59036

Dear Mr. Newcombe:

The Environmental Protection Agency awarded the City of Harlowton a Brownfields Cleanup Grant that will be used to address hazardous building materials and petroleum contaminated soils at the Harlowton Roundhouse and Railyard Site at 308 A Ave S, Harlowton, MT 59036 (Legal Description: S27, T08 N, R15 E, TRACT IN THE N2N2 - RAILROAD DEPOT, NAID: 71976655). Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, requires that federal agencies consider the effects of federal undertakings on historic properties and afford the State Historic Preservation Office (SHPO) a reasonable opportunity to comment with regard to such undertakings. To this end, I am writing to seek concurrence on an adverse effect determination for the Harlowton Roundhouse and Railyard Site.

The City of Harlowton proposes to clean up the property by removing asbestos and lead-based paint from the Roundhouse and excavating petroleum contaminated soils at the Railyard site. Building demolition will not be included as part of the process, but demolition and replacement of a formerly interior brick firewall will modify the existing historic Roundhouse structure. During the excavation of petroleum contaminated soils, there is also a likelihood of encountering historic artifacts. Without a plan to properly address how to preserve and/or memorialize these artifacts, adverse effects could also occur at the Railyard site from this action.

The Milwaukee Road Historic District is listed in the National Register of Historic Places (NAID: 71976655) and the Harlowton Roundhouse is listed as a contributing structure to this designation. The Railyard area which includes the contributing structures of the oil tank, well house, water treatment plant, storeroom, fuel tank, yard master's office, steam room, depot, and freight house is also included in the designation. Therefore, modifications to the Roundhouse structure and excavations at the Railyard area from this federal action will diminish the characteristics of this historic site and will have an adverse effect on a property eligible for the National Register.

Sincerely,

Greg Davis
Brownfields Project Manager