DRAFT RESTORATION PLAN

AND ENVIRONMENTAL ASSESSMENT

FOR THE EAST HELENA SMELTER SITE

LEWIS AND CLARK COUNTY, EAST HELENA, MONTANA

Prepared by:

U.S. Department of the Interior

U.S. Fish and Wildlife Service

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Cover Photo

Images of grassland, riparian, and stream areas along Prickly Pear Creek – photographs courtesy of the U.S. Fish and Wildlife Service.

List of Acronyms & Abbreviations

ASARCO	American Smelting and Refining Company
BLM	Bureau of Land Management
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
FONSI	Finding of no Significant Impact
METG	Montana Environmental Trust Group
MDEQ	Montana Department of Environmental Quality
MT	Montana
NEPA	National Environmental Policy Act
NRDAR	Natural Resource Damage Assessment and Restoration
NRDP	Montana Department of Justice Natural Resource Damage Program
RCRA	Resource Conservation and Recovery Act (RCRA)
RP	Restoration Plan
Service	U.S. Fish and Wildlife Service

1.0 - INTRODUCTION

The U.S. Fish and Wildlife Service (Service or Trustee), acting as a natural resource trustee on behalf of the U.S. Department of the Interior (DOI), has prepared this Draft Restoration Plan and Environmental Assessment (Draft RP/EA) for the East Helena Smelter Site (Site) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, (42 U.S.C. § 9601 *et seq*.) and the CERCLA Natural Resource Damage Assessment and Restoration (NRDAR) regulations (43 C.F.R. Part 11). The Service initiated a NRDAR at the Site to determine and quantify injuries to natural resources and their services resulting from the releases of hazardous substances at and from the Site into the terrestrial and aquatic environment. As part of the NRDAR process, the natural resource trustee must also identify and select restoration actions that will compensate for the injured resources and services and seek to recover compensation from the entity responsible for the injuries to natural resources and lost services.

The Site is located in west-central Montana in the City of East Helena in Lewis and Clark County (Figure 1). Lead smelting activities began at this location in 1888. Later zinc smelting activities began and both continued through April 2001. Site operations at the smelter released metals and other hazardous substances into the environment, resulting in high concentrations of metals in soil, sediment, surface water, and groundwater in the Helena Valley, including Prickly Pear Creek. Hazardous substances released at and from the Site include arsenic, cadmium, copper, lead, mercury, selenium, and zinc. Natural resources, including migratory birds, have been exposed to and adversely affected by these substances.

The Trustee prepared this Draft RP/EA in accordance with CERCLA Section 111(i) and its implementing regulations, 43 C.F.R. § 11.93, to inform the public as to the types and scale of restoration to be undertaken to compensate for injuries to natural resources and ecological services lost due to releases of hazardous substances, including metals at and from the Site. Consistent with the CERCLA NRDAR regulations and the National Environmental Policy Act (NEPA), this Draft RP/EA includes a reasonable number of restoration alternatives and identifies Preferred Alternatives (Alternatives B & C). Public comments are being sought on this Draft RP/EA and will be considered and incorporated in the Final RP/EA as appropriate.

1.1 - Natural Resource Trustee and Authorities

This Draft RP/EA was prepared pursuant to the authority of DOI acting in its capacity as a natural resource trustee under CERCLA; Subpart G of the National Oil and Hazardous Substances Contingency Plan (40 C.F.R. § 300.600); and the CERCLA NRDAR regulations (43 C.F.R. Part 11). The NRDAR process allows a natural resource trustee to pursue claims against a potentially responsible party for damages based on injuries to natural resources and their associated services in order to compensate the public for the loss of natural resources and their services. The goal of this process is to implement actions to restore, replace, or rehabilitate the natural resources that were injured or lost as a result of the release of a hazardous substance, or to acquire the equivalent resources or the services they provide. The scope of DOI's trusteeship is for natural resources, and

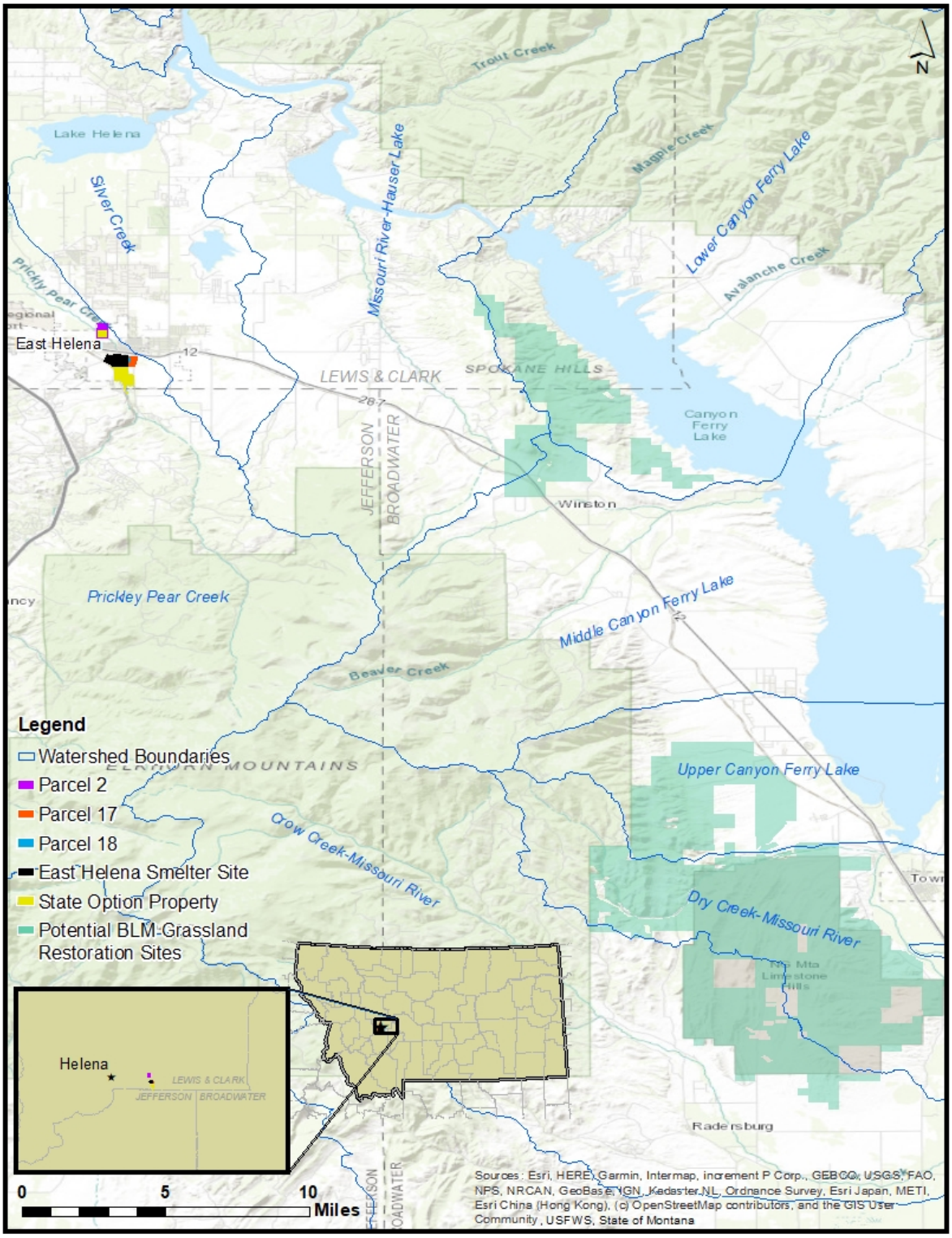

Figure 1. Location of the East Helena Smelter Site and the proposed restoration alternatives in Lewis and Clark County, Montana.

their supporting ecosystems, belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by DOI, such as migratory birds and endangered species, 40 C.F.R. § 300.600.

Additionally, the NEPA, 42 U.S.C. §. 4321 *et seq*., applies to the proposed actions in this Draft RP/EA. NEPA applies to federal agency actions that affect the human environment. Federal agencies are obligated to comply with NEPA regulations adopted by the Council on Environmental Quality. NEPA requires that an EA be prepared in order to determine whether the proposed restoration actions will have a significant effect on the quality of the human environment. If an impact is considered significant, then an Environmental Impact Statement is prepared. If the impact is considered not significant, then a Finding of No Significant Impact (FONSI) is issued. For a proposed CERCLA RP, if a FONSI determination is made, the trustee may then issue a Final RP describing the selected restoration action(s). In accordance with NEPA and its implementing regulations, this Draft RP/EA summarizes the current environmental setting; describes the purpose and need for restoration actions; identifies alternative actions; assesses their applicability and potential impact on the quality of the physical, biological, and cultural environment; and outlines public participation in the decision-making process.

Consistent with federal laws, the DOI is continuing to evaluate the preferred restoration alternatives identified in this Draft RP/EA for compliance with other applicable laws. Once finalized, these additional environmental compliance evaluations will be included as appendices to the Final RP/EA for the Site. For the Draft RP/EA, other potentially applicable laws and regulations include:

- The Endangered Species Act, 16 U.S.C. § 1531, et seq.
- National Historic Preservation Act of 1966, 16 U.S.C. § 470 *et seq.*

1.2 - Site History and Description of Natural Resource Injuries

American Smelting and Refining Company (ASARCO) operated the East Helena Smelter to produce lead bullion and zinc oxide. Byproducts of the operation included sulfuric acid, matte (iron, copper, and lead oxides), and speiss (copper arsenides and antimodes). Prior to the 1970s, non-contact cooling water was continuously discharged into Prickly Pear Creek at a rate of over 2 million gallons per day. Effluent from washing of the speiss, as well as other process water, was also released into Prickly Pear Creek. In 1975, ASARCO ceased discharging effluent into Prickly Pear Creek (Montana Department of Health and Environmental Sciences, 1981). Aerial emissions from the smelting stacks caused widespread distribution of contaminants (lead and arsenic) in the Helena Valley. Hazardous substances released at and from the Site include arsenic, cadmium, copper, mercury, lead, selenium, and zinc. These contaminants have been identified as hazardous substances (40 CFR Part 302; Table 302.4) and are included in the definition of hazardous substances under § 9601 (14).

In September of 1984, the U. S. Environmental Protection Agency (EPA) added the Site to its National Priorities List of Superfund sites with uncontrolled hazardous waste. In 1998, EPA transferred remediation of the Site from CERCLA to the Resource Conservation and Recovery Act (RCRA) corrective action programs set forth in the RCRA Consent Decree entered into by EPA and ASARCO. ASARCO filed for bankruptcy in 2005. The Trustee of the Montana Environmental Custodial Trust (the Custodial Trust) was established in 2009 as part of the global ASARCO bankruptcy settlement.

The Custodial Trust's responsibilities include: owning and managing approximately 2,000 acres of property in East Helena once owned by ASARCO; holding and investing the funds set aside for clean-up of the former ASARCO smelter; cleaning up contamination in soils, sediments, and groundwater; facilitating site redevelopment; and, ultimately, selling or transferring the East Helena property.

As part of the clean-up, EPA conducted a Supplemental ERA in 2003 (EPA 2005), which documented lead concentrations in soils that exceed concentrations known to be toxic to natural resources, including migratory birds. The Supplemental ERA for the Site states that soil lead concentrations exceeding 650 mg/kg may adversely impact passerine insectivores (EPA 2005). Cadmium and copper concentrations in site soils also exceeded the Ecological Soil Screening Levels. Based on the Service's trusteeship, the NRDAR focused on potential effects to migratory birds as a result of exposure to lead. Based on these sampling results, through the NRDAR, the Service determined 427 acres of land in and around the Site had lead concentrations high enough to injure migratory birds relying on those impacted grasslands (which include the East Fields, Dartman Fields and Lamping fields).

The State of Montana also brought and settled Natural Resource Damage (NRD) claims for injuries to resources under its trusteeship (40 C.F.R. 300.605), including groundwater, surface water, and soils, including the groundwater aquifer and river bed in the vicinity of the Site. In January 2019, the Montana Department of Justice, Natural Resource Damage Program (NRDP) released its draft Restoration Plan and Environmental Assessment Checklist to allocate the recovered restoration funds (NRDP 2019).

1.3 - Relationship to Remediation and Other Restoration Activities

The Service coordinates with EPA and the Montana Environmental Trust Group (METG) on response actions at the Site. This coordination provides an understanding of the likely outcome of clean-up or other regulatory processes. The Service also has coordinated with the State of Montana, both on response actions and the state's NRDAR process, in developing the alternatives and in identifying the preferred alternatives in this Draft RP/EA. The restoration actions described in this Draft RP/EA and in the Preferred Alternatives are complementary to, but not duplicative of, the clean-up actions to clean up the Site and to restoration actions being contemplated/implemented by the State.

EPA has approved several clean-up activities over the last seven years to address more than a century of lead smelting that left extensive contamination in soil and groundwater at the Site. RCRA Corrective Action clean-up activities were implemented to reduce the off-site migration of contaminants in groundwater and to prevent exposure to contaminated soils. An Evapotranspirative Cover System was constructed over the entire smelter area, limiting the risk of human and ecological receptors being exposed to contaminated soils and preventing rainwater from leaching contaminants into groundwater. The natural, self-sustaining evapotranspirative cover also stores and sheds clean stormwater. Prickly Pear Creek was moved to a new meandering 1.25-mile-long creek channel with one-hundred acres of previously non-existent floodplain. The new floodplain provides riparian habitat and flood storage capacity to mitigate flooding in the downstream, flood-prone areas of East Helena.

1.4 - Summary of Settlement

The United States, on behalf of DOI, settled potential claims for NRD at the Site with ASARCO. The East Helena NRD settlement was part of the 2009 ASARCO bankruptcy settlement, ASARCO paid $706,000[1] to resolve its potential NRD liability to DOI at the Site. This Draft RP/EA is programming all remaining funds to restore and rehabilitate habitat to support migratory birds.

1.5 - Restoration Goals and Objectives / Purpose and Need for Restoration

The purpose of restoration is to return natural resources and the services provided by those natural resources to baseline condition or the condition that would have existed had the injury not occurred, and to compensate the public for the loss of those natural resources over time. Restoration actions are often needed because the injured natural resources may not have the capacity to re-establish their functions within an ecosystem in a timely manner without human intervention. In addition to the cost of restoring resources to baseline condition, CERCLA authorizes trustees to recover compensation for the interim lost use of these natural resources between the date of injury and the date when restoration has been completed. Funds recovered for interim losses are used for additional restoration actions, including acquisition, rehabilitation, and/or replacement of natural resources (42 U.S.C. § 9607 (f)(l)).

The restoration goal for this project would be to restore grassland and riparian habitats with an intact composition, structure, and functionality capable of supporting migratory bird species. Restored habitats would have similar diversity and relative abundance or density of grassland and riparian species between restoration and reference sites. The objective for this project would be to attain grassland community plant measurements (e.g., native plant species richness and cover) progressing towards reference site condition within a 7 to 10 year measurement period.

1.6 - Public Review and Participation

Public participation and review is an integral part of the restoration planning process, and is specifically required in the CERCLA NRDAR regulations (e.g., 43 C.F.R. §11.81(d)(2)). In addition, NEPA and its implementing regulations require that federal agencies fully consider the environmental impacts of their proposed decisions and that such information is made available to the public.

This Draft RP/EA will be available for public comment and review for 30 days from the date of publication in the Helena Independent Record [Helenair.com; (406) 447-4000]. Interested individuals, organizations, and agencies may submit comments by writing or emailing:

[1] These restoration funds were deposited into a segregated Custodial Trust NRD Account for the East Helena Site held by the Custodial Trust, where it has earned interest since 2009. In 2010, 2012, and 2015, the Service withdrew money to support its restoration planning, implementation and monitoring costs related to this Site. These withdrawals totaled $25,000.

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Copies of this document and relevant documents are available online at:
https://www.cerc.usgs.gov/orda_docs/CaseDetails?ID=1271

Physical copies of this Draft RP/EA are also available for review by interested members of the public at the following locations:

- East Helena Branch of the Lewis & Clark Library, 16 E. Main Street, East Helena, MT 59635;
- Offices of the Montana Environmental Trust Group (METG), Trustee of the Montana Environmental Custodial Trust, 325 Manlove Street, East Helena, MT 59635; and
- U.S. Fish and Wildlife Service Montana Ecological Services Field Office, 585 Shephard Way, Suite 1, Helena Montana, 59601.

Arrangements must be made in advance to review or obtain copies of physical records at the U.S. Fish and Wildlife Service Montana Field Office by contacting the Service representative listed above.

The Service will review and consider all public comments and input on the Draft RP/EA received during the public comment period prior to finalizing the RP/EA. The Service will prepare a responsiveness summary to the comments that will be included as an appendix in the Final East Helena Smelter Site RP/EA. The development of the Draft RP/EA, the public comment process, and finalization of the RP/EA is performed solely by the Trustee. Based on the comments from the public, or other information, the Trustee may amend the Final RP/EA if significant changes are made to the type, scope, or impact of the projects. In the event of a significant modification to the Final RP/EA the Trustee will provide the public with an opportunity to comment on that particular amendment.

2.0 - PROPOSED RESTORATION ALTERNATIVES

The Trustee considered several restoration alternatives to compensate for lost natural resources and associated services and evaluated each alternative against the project selection criteria described in this section.

2.1 - Restoration Evaluation Criteria

CERCLA NRDAR regulations provide ten factors to consider when evaluating restoration alternatives (43 C.F.R. § 11.82(d)).

1. **Technical Feasibility:** technology and management skills are well known and that each element of the alternative has a reasonable chance of successful completion in an acceptable period of time, 40 CFR Sec.11.14 (qq).

2. **Cost Benefit Comparison:** the relationship between the expected benefits of the alternative versus the costs; the full range of costs and benefits should be considered, in terms of recovery of the resource and public use.

3. **Cost Effectiveness:** when two or more activities provide the same or a similar level of benefits, the least costly activity providing that level of benefits will be selected. 40 CFR Sec. 11.14(j).

4. **Results of Any Actual or Planned Response Actions:** The contribution of any action to clean up the site will be considered in the identification and evaluation of restoration alternatives.

5. **Potential for Additional Injury:** Whether a restoration alternative may cause further harm to injured natural resources or other resources including short-term, long-term and indirect impacts. Alternatives that avoid or minimize adverse impacts to the environment and natural resources are preferred.

6. **Natural Recovery Period:** Consideration of the time required for injured resources to recover if no action is taken.

7. **Ability of Resources to Recovery With or Without Restoration:** Whether the resource would be able to recover on its own versus the ability to recover associated with the preferred restoration alternative(s). Projects that restore, rehabilitate, replace, or acquire the equivalent of the same type of resources and services injured by the contamination are preferred to projects that benefit different resources or services.

8. **Adverse Effects to Public Health and Safety:** Whether an alternative would pose unacceptable risks to public health and safety.

9. **Consistency with relevant federal, state, and tribal policies.**

10. **Compliance with applicable federal, state, and tribal laws.**

The Trustee developed three additional evaluation criteria for the proposed alternatives for this Site. These additional criteria are not ranked in order of priority. The criteria are:

- **Relation to Injury:** Whether a restoration alternative would provide diverse habitat that would support a greater variety of migratory bird species, or that provide ancillary benefits to other resources or resource uses. An alternative that would provide more habitat diversity or multiple resource and service benefits is favored.
- **Location:** The geographic proximity of the alternative to the Site. An alternative that is located closer to the site of natural resource injury is favored.
- **Long-term Site Stewardship:** The existence of a responsible entity (e.g., local agency or conservation group) with the willingness and capacity to perform long-term protection and management of the restored site.

2.2 - Restoration Alternatives Considered

The following subsections present a description of restoration alternatives identified and developed by the Trustee to benefit migratory birds consistent with the restoration goals discussed in Section 1.5. Table 1 provides a brief overview of each restoration alternative considered in this Draft RP/EA. The Trustees evaluated the alternatives to determine if they provide sufficient type and quality of resources to compensate for those lost due to contamination in the context of both site-specific and Restoration Evaluation Criteria discussed above (43 C.F.R. Sec. 11.82(d)) (Table 2). The Trustee also evaluated whether significant effects may be associated with the proposed alternatives to restore the natural resources injured or lost due to the releases of hazardous substances as required by NEPA (40 C.F.R. Sec. 1508.9b).

Table 1. Brief description of the proposed restoration alternatives for the East Helena Smelter Site in Lewis and Clark County, Montana.

Alternative	Description
A: No Action/Natural Recovery	No projects implemented
B: Native Grassland and Wetland Restoration Project along Prickly Pear Creek (Preferred)	Wetland, floodplain, and grassland habitat improvements along Prickly Pear Creek
C: Native Grassland Restoration Project along Prickly Pear Creek (Preferred)	Grassland habitat improvements along Prickly Pear Creek
D: Restoration of Migratory Bird Habitat on Federal Lands Near East Helena, MT	Grassland habitat improvements on federal lands to the east of East Helena

2.2.1 - Alternative A: No Action/Natural Recovery

Pursuant to CERCLA and NEPA, the Trustee considered a No Action alternative. Under this alternative, the Trustee would rely on natural recovery and would take no direct action to restore injured natural resources or compensate for interim lost natural resource services. This alternative would include the continuance of the response actions but would not include additional activities aimed at enhancing or restoring migratory birds. Under this alternative, no compensation would be provided for interim losses.

The Trustee found that the No Action alternative would not satisfy the Restoration Evaluation Criteria under CERCLA or the site-specific criteria. This Alternative would not compensate for injured resources and technically feasible and cost-effective restoration approaches are available to compensate for these losses. Therefore, the No Action Alternative is not a preferred restoration alternative when evaluated against the Restoration Evaluation Criteria.

2.2.2 - Alternative B: Native Grassland and Wetland Restoration Project along Prickly Pear Creek (Preferred)

Alternative B includes reshaping and revegetating an 80-acre parcel located along Prickly Pear Creek to the north of Kennedy Park and east of Wylie Drive in Helena, MT (Figure 2), also referred to as Parcel 2. This Alternative would occur after the completion of clean-up activities, which would consist of contaminated soil removal, mixing, and grading. The Alternative enhances wetland, and creates and enhances floodplain, and grassland habitats suitable for a variety of migratory bird species. Specifically, this Alternative would expand floodplain near Prickly Pear Creek to increase the area of ephemeral wetlands and to provide a greater diversity of habitat than currently exists for migratory bird use. Migratory birds would benefit from this project through improvements to key habitat requirements to increase migratory bird species richness, density, and abundance (Reynolds and Trost 1980; Reynolds and Trost 1981; Bradford et al. 1998).

Seeding and/or planting native vegetation that is consistent with surrounding areas for the benefit of migratory bird species would occur once clean-up activities are complete. Alternative B may also include educational signage related to migratory bird species along proposed trails through the Site (CTA Architects and Engineers 2016) (Note that the creation of trails on the Site is not included as part of this Alternative); the location of the trail through this parcel was proposed in the Prickly Pear Creek Greenway (CTA Architects and Engineers 2016), but funding has not yet been secured for implementing the design.

This Alternative also includes invasive and noxious plant species control on an annual basis for up to 5 years. Use of mechanical or chemical techniques, such as glyphosate (e.g., Roundup) and triclopyr (e.g., Garlon 3A), is anticipated to remove invasive plants. Following completion of site grading and establishment of vegetation, the restoration site would be placed under a conservation easement to ensure long-term stewardship for conservation purposes, and title would be transferred to a qualified land management entity.

The Trustee found this Alternative to provide the greatest benefits to migratory birds in relation to the costs of the restoration compared to other proposed alternatives. Alternative B more comprehensively addresses habitat issues that limit migratory bird use of the area by providing multiple habitat types, which benefits a wider variety of bird species.

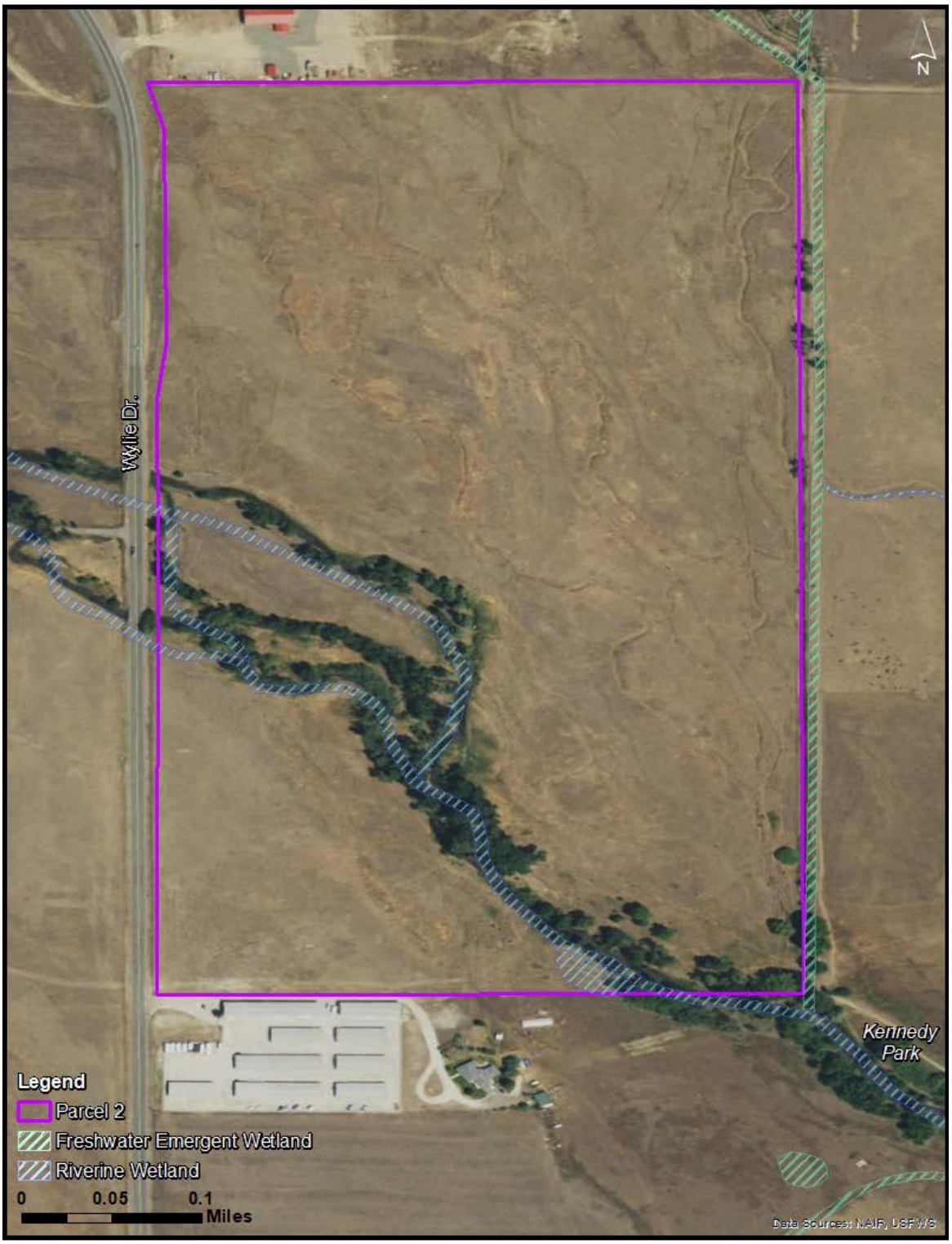

Figure 2. Location of Alternative B: Native Grassland and Wetland Restoration Project along Prickly Pear Creek in Lewis and Clark County, Montana.

2.2.3 - Alternative C: Native Grassland Restoration Project along Prickly Pear Creek (Preferred)

Alternative C considers removal of non-native grassland and revegetating land located along Prickly Pear Creek to the south of Highway 12 between Highway 518 and South Montana Avenue in East Helena, MT (Figure 3), also referred to as Parcel 17 and part of Parcel 18. This project would replace a crested wheatgrass (*Agropyron cristatum*)-dominated plant community with a native grassland community on up to 50 acres. The eastern portion of Parcel 17 may be sold for development along South Montana Avenue. Restoration actions will not be performed in these areas. Migratory birds would benefit from this project as described in Section 2.2.2 - Alternative B.

The parcel is currently dominated by the non-native, crested wheatgrass, which has been shown to decrease bird species richness and density (Reynolds and Trost 1980; Reynolds and Trost 1981). Native plants have difficulty establishing in crested wheatgrass communities due to a combination of high dispersal rate of its seeds and long-term dominance over and exclusion of native species, resulting in a near-monoculture of this dominant, non-native grass. Controlling crested wheatgrass would require suppression of seed production, removal of plants, and addition of native grass and forb seed (Henderson and Naeth 2005).

This Alternative would use mechanical (e.g., disking) and/or chemical (as described in section 2.2.2 - Alternative B) means to remove existing plant species (Hulet et al. 2010), followed by seeding and/or planting native vegetation that is consistent with surrounding areas for the benefit of migratory bird species. Multiple years of treatment may be required to further reduce the crested wheatgrass population.

This Alternative also includes monitoring and invasive and noxious plant species control on an annual basis for up to 5 years. The plant species control on the Site may require the use of mechanical or chemical techniques, such as glyphosate (e.g., Roundup) and triclopyr (e.g., Garlon 3A). Following the completion of plant establishment, the restoration site would be placed under a conservation easement to ensure long-term site stewardship and title would be transferred to a qualified land management entity. The easement would include public access, and restrict commercial and/or residential development. Alternative C may also provide educational signage related to migratory bird species along proposed trails through the site that would be developed by another entity (CTA Architects and Engineers 2016).

The Trustee found this Alternative to be beneficial for migratory birds and technically feasible. Although only a single habitat type would be restored under this Alternative, which would benefit a less diverse collection of bird species than Alternative B, the contiguous nature of the habitat to be restored provides a high likelihood of success to restore migratory birds. In addition, the benefits in relation to the costs are appropriate.

2.2.4 - Alternative D: Restoration of Migratory Bird Habitat on Federal Lands near East Helena, MT

Alternative D includes removal of non-native and invasive plants, followed by revegetation with native plants on Bureau of Land Management (BLM) property located approximately eight to 31

miles east of East Helena, MT (Figure 4). Similar to Alternative C, this project would enhance existing grassland habitat through mechanical (e.g., disking) and/or chemical (as described in section 2.2.2 - Alternative B) means to remove existing plant species, using mechanical and/or chemical treatments on plants as described in Section 2.2.3 for the benefit of migratory bird species. Multiple years of treatment may be required. Additionally, actions may be taken to remove encroaching vegetation, such as juniper (*Juniperus scopulorum*). Migratory birds would benefit from this project by increasing habitat used by migratory birds, resulting in increased species richness and density through the reduction in crested wheatgrass (Reynolds and Trost 1980; Reynolds and Trost 1981). Under this Alternative, the BLM would continue to manage the restored property consistent with the restoration goals as habitat for migratory birds and consistent with applicable land management plan(s).

The Trustee found this Alternative to be beneficial for migratory birds, however due to the single habitat type to be developed as well as the disparate locations for the restoration actions, the benefits in relation to the costs were less than the other restoration alternatives considered, thus the Trustees do not propose this as a preferred alternative.

2.3 - Alternatives Considered, But Not Further Evaluated

The Trustee also considered two alternatives that were eliminated from further evaluation. These alternatives involved a treatment that would add phosphorus to lead-remediated soils to reduce bioavailability prior to wetland and grassland restoration. These alternatives would have modified Alternatives B and C to include this treatment on Parcels 2 and 17/18, respectively, along Prickly Pear Creek. The Trustee rejected the phosphorus addition treatment alternatives due to the potential of adverse effects of phosphorus loading to Lake Helena, which Prickly Pear Creek flows into. Both Prickly Pear Creek and Lake Helena are listed as impaired waterbodies and phosphorus is one of the water quality standards that is exceeded (MDEQ 2017). Thus, the addition of phosphorous to soils potentially could adversely affect water quality in both Prickly Pear Creek and Lake Helena, so no further evaluation was performed.

Figure 3. Location of Alternative C: Native Grassland Restoration Project along Prickly Pear Creek in Lewis and Clark County, Montana.

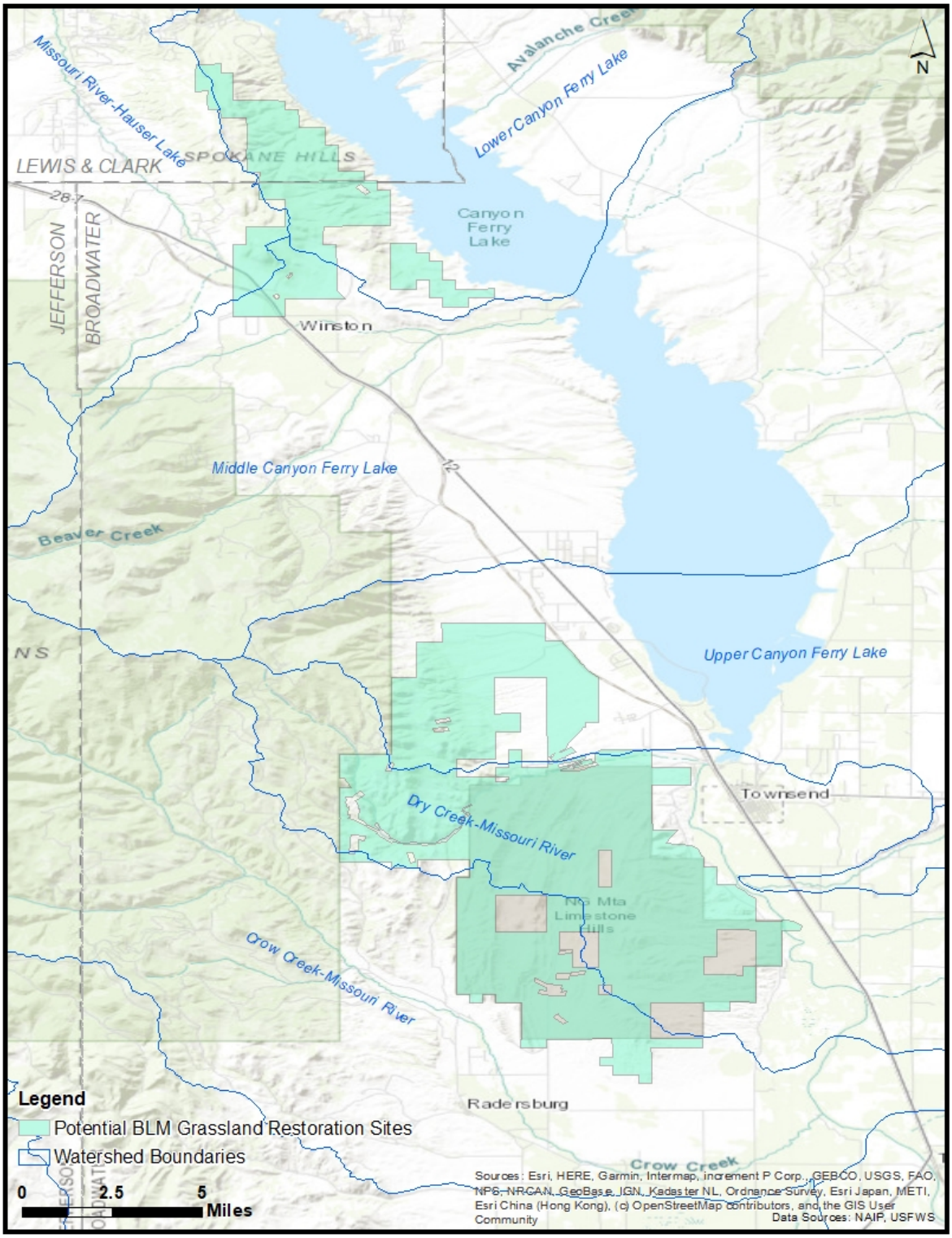

Figure 4. Location of Alternative D: Restoration of migratory bird habitat on federal lands in Lewis and Clark County, Montana.

Table 2. Evaluation of the Proposed Restoration Alternatives for the East Helena Smelter Site NRDAR, Lewis and Clark County, Montana.

ALTERNATIVE	DESCRIPTION	CRITERIA AND EVALUATION
A	No Action/Natural Recovery	1. Technical Feasibility: Not applicable 2. Cost/Benefit: Not applicable 3. Cost Effectiveness: Not applicable 4. Likelihood of Success: Interim losses not compensated. 5. Additional Injury: Additional interim loss would occur. 6. Recovery Period: Decades. 7. Recovery Ability: Limited, would require decades. 8. Public Health and Safety: Not applicable. 9. Policy Consistency: Fail. Restoration is feasible under CERCLA. 10. Regulatory Compliance: Not applicable. 11. Relation to Injury: Unknown. 12. Geographic proximity: Not applicable. 13. Long term Site Stewardship: Pass except for a portion of Parcel 2.
B	Native Grassland and Wetland Restoration Project along Prickly Pear Creek (Preferred)	1. Technical Feasibility: High. 2. Cost/Benefit: High. 3. Cost Effectiveness: High. 4. Likelihood of Success: High. Proven Technique. 5. Additional Injury: Temporary impacts due to potential sediment releases to nearby Prickly Pear Creek. 6. Recovery Period: High. 7. Recovery Ability: High. 8. Public Health and Safety: Pass.

		9. Policy Consistency: Pass. 10. Regulatory Compliance: Pass. 11. Relation to Injury: High. 12. Geographic proximity: Pass. 13. Long Term Stewardship: Pass.
C	Native Grassland Restoration Project along Prickly Pear Creek (Preferred)	1. Technical Feasibility: High. 2. Cost/Benefit: Produces multiple benefits to aquatic fauna and injured resources at reasonable costs. 3. Cost Effectiveness: High. 4. Likelihood of Success: High. Proven Technique. 5. Additional Injury: Temporary impacts due to potential sediment releases to nearby Prickly Pear Creek. 6. Recovery Period: Short. 7. Recovery Ability: High. 8. Public Health and Safety: Pass. 9. Policy Consistency: Pass. 10. Regulatory Compliance: Pass. 11. Relation to Injury: Direct, moderate. 12. Geographic proximity: Pass. 13. Long Term Stewardship: Pass.
D	Restoration of Migratory Bird Habitat on Federal Lands near East Helena, MT	1. Technical Feasibility: High. 2. Cost/Benefit: Satisfactory. 3. Cost Effectiveness: Pass. 4. Likelihood of Success: High. Proven technique. 5. Additional Injury: Negligible. 6. Recovery Period: Immediate.

		7. Recovery Ability: Not applicable. 8. Public Health and Safety: Low concern. 9. Policy Consistency: Pass. 10. Regulatory Compliance: Pass. 11. Relation to Injury. Direct. Moderate. 12. Geographic proximity: Pass. Farther than other alternatives considered. 13. Long Term Stewardship: Pass.

3.0 ENVIRONMENTAL ASSESSMENT

In this section, the Service assesses the environmental consequences of Alternatives A, B, C, and D to determine whether implementation of any of these alternatives may significantly affect the quality of the human environment, particularly with respect to physical, biological, socio-economic, or cultural environments. Lastly, the Service makes a conclusion at the end of the evaluation for each alternative identifying whether it is a preferred alternative and whether it should be implemented in the event a FONSI is reached following the public comment period and publication of the Final RP/EA.

The following definitions will be used to characterize the nature of the various environmental consequences evaluated in this Draft RP/EA:

- *Short-term or long-term impacts.* In general, short-term impacts are those that would occur only with respect to a particular activity or for a finite period. Long-term impacts are those that are more likely to be persistent and chronic.

- *Direct or indirect impacts.* A direct impact is caused by a proposed action and occurs contemporaneously at or near the location of the action. An indirect impact is caused by a proposed action and might occur later in time or farther removed in distance but still be a reasonably foreseeable outcome of the action.

- *Negligible, minor, moderate, or major impacts.* These relative terms are used to characterize the magnitude of an impact. Negligible impacts are generally not quantifiable and do not have perceptible impacts on the human environment. Minor impacts are generally those that might be perceptible but, in their context, are not amenable to measurement because of their relatively inconsequential effect. Moderate impacts are those that are more perceptible and, typically, more amenable to quantification or measurement. Major impacts are those that, in their context and due to their intensity (severity), have the potential to meet the thresholds for significance set forth under NEPA (40 C.F.R. § 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation to fulfill the requirements of NEPA.

- *Adverse or beneficial impacts.* An adverse impact is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. A single act might result in adverse impacts on one environmental resource and beneficial impacts on another resource.

- *Cumulative impacts.* Cumulative impacts are defined as the "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 C.F.R. § 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time within a geographic area.

3.1. Affected Environment

This Draft RP/EA evaluates restoration alternatives to compensate the public for the natural resource injuries resulting from exposure to hazardous substances. As part of the evaluation, the Trustee assessed the current physical, biological, socio-economic, and cultural resources of the area within which restoration is likely to occur (Figure 1) ("Affected Area"). This information will ensure that potential restoration projects are designed to maximize ecological benefits while minimizing or eliminating project-related adverse environmental consequences.

3.1.1 - Physical and Biological Environment

The alternatives described in this plan occur within the Upper Missouri River Basin watershed. Alternatives B and C are located within the Prickly Pear Creek subwatershed. Alternative D is located within the Missouri River-Hauser Lake, Lower Canyon Ferry Lake, Middle Canyon Ferry Lake, Upper Canyon Ferry Lake, Dry Creek-Missouri River, and Crow Creek-Missouri River subwatersheds (Figure 1).

The region contains broad intermontane valleys that formed in Tertiary Sediments and Quaternary alluvial deposits derived from volcanic rocks, shale, and sandstone. Grasslands associated with this landscape include foothills prairie dominated by wheatgrass-gramma-needlegrass type (Nesser et al. 1997). Sagebrush steppe is also present. Common native grasses in the area include bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca Idahoensis*), needle-and-thread grass (*Hesperostipa comata*), and blue grama (*Bouteloua gracilis*) (Barker and Whitman 1988). The most common native shrub is big sagebrush (*Artemisia tridentata*).

Grassland vegetation communities have been altered from historic (pre-settlement) conditions by a combination of management activities, including long-term fire suppression, noxious weed and non-native plant presence, and livestock grazing. Grassland and shrubland habitats in the project area have undergone colonization (often referred to as encroachment) by conifers due to the interruption of the natural disturbance regime primarily by long-term fire suppression. Many acres of grasslands and shrublands within the region have been converted to woodlands as a result of colonization by juniper, Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), and limber pine (*Pinus flexilis*). As a result, these acres are outside the expected historic range of natural variability. In their current condition, they are less stable and more susceptible to damage from disturbance events like severe or uncharacteristically large-scale wildland fire, insect infestations, and weed species establishment. Additionally, they are apt to change to the extent that they could cross ecological thresholds, which would prevent these vegetation communities from returning to a condition within the expected range of variability and functionality without help from an outside influence (e.g., application of herbicides to control weed species, spreading native seed to establish early seral communities with desired species composition) (USDOI-BLM 2015). Free-flowing rivers and creeks in this area are home to a variety of fish species, including brook (*Salvelinus fontinalis*), brown (*Salmo trutta*), rainbow (*Oncorhynchus mykiss*), and westslope cutthroat (*Oncorhynchus clarki lewisi*) trout (MT FWP 2014).

Occurrence records for federally listed species in Lewis and Clark County include Grizzly Bear (*Ursus arctos horribilis*), Canada Lynx *(Lynx Canadensis*), Bull Trout (*Salvelinus confluentus*), Red Knot

(*Calidris canutus rufa*), Wolverine (*Gulo gulo luscus*), and Whitebark Pine (*Pinus albicaulis*). No critical habitat for these species is designated on the restoration sites of the Preferred Alternatives and these species are unlikely to occur there due to the lack of desired habitat. Birds of Conservation Concern, or species protected by the Bald and Golden Eagle Protection Act potentially occurring on the properties include bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos)*, lesser yellowlegs (*Tringa flavipes*), long-billed Curlew (*Numenius americanus*), olive-sided flycatcher (*Contopus cooperi*), rufous hummingbird (*Selasphorus rufus*), and willet (*Tringa semipalmata*) (USFWS IPAC 2019). Federally listed species are slightly different in the project area for Alternative D, as portions of Broadwater County are also included. The Red Knot does not occur in the Alternative D project area, and additional listed species are whooping crane (*Grus Americana*) and a wetland plant species, the Ute-ladies' tresses (*Spiranthes diluvialis*) (USFWS IPAC 2019). Neither of these species are likely to occur in the project areas, and any areas likely to contain the Ute-ladies' tresses would be avoided.

3.1.2 - Demographics

A summary of demographic data is provided in Table 3. In general, the proposed projects areas are rural where agriculture, including pastured cattle, hay cropping, and timber, produce jobs for local populations. Areas of fastest growth are in commercial and services sectors along major road transportation corridors and larger cities.

Table 3. Project Area Demographics by Montana County.

Demographic* Category	Lewis and Clark County	Broadwater County
Population (2018 estimate)	68,700	6,085
Minority Population**	5,908 (8.6% of total)	414 (6.8% of total)
Low Income Population (estimate)***	5,702 (8.3% of total)	596 (9.8% of total)
Households	31,793 (2.34 persons per household)	2,405 (2.37 persons per household)
Population per square mile	19.6	4.9

* Statistics generated using 2010 U.S. Census Bureau data, Vintage 2017 Population Estimates Program, 2017 Small Area Income and Poverty Estimates, and American Community Survey

** State average is 13.8%

*** State average is 12.5% (estimate)

3.1.3 - Recreation

The Helena Valley is surrounded by U.S. Forest Service and BLM lands offering roads and trails for motorized and non-motorized recreation including: hiking, biking, horseback riding, backpacking, cross-country skiing, Off Highway Vehicle riding, and snowmobiling. Fishing, camping, and boating are possible on numerous local streams, lakes, and reservoirs.

3.1.4 - Cultural and Historic Resources

Prior to the implementation of the proposed project, potential impacts to historic and archaeological resources will be reviewed. Section 106 of the National Historic Preservation Act requires federal

agencies to consider the effects of Preferred Alternatives on historic properties. Historic properties must also be given consideration under NEPA. The National Register of Historic Places is a federally-maintained list of districts, sites, buildings, structures, objects, and landscapes significant in American history, prehistory, architecture, archaeology, engineering, and culture. Archaeological sites are places where past peoples left physical evidence of their occupation. Sites may include ruins and foundations of historic-era buildings and structures. Native American cultural resources may include human skeletal remains, funerary items, sacred items, and objects of cultural patrimony. Historic properties can also include traditional cultural properties. Currently, there are no known cultural or historic resources within the boundaries of the proposed sites to be restored.

The proposed Alternatives are located in the vicinity of the East Helena Smelter. In expectation of remedy and restoration activities on the Site, METG completed a Cultural Resource Inventory and Assessment on ASARCO residences in the Vicinity of the Smelter (Axline 2010). There were two resources eligible as historically significant: the Former ASARCO Manager's House and Assistant Manager's House. The Manager's House was destroyed by fire on August 24, 2012 and the Assistant Manager's House was torn down after compliance with applicable regulations. No known cultural or historic resources within the boundaries of the proposed restoration sites were noted in the report, but the report was limited to structures. The Service will consult with the Montana State Historic Preservation Office to complete Section 106 review and compliance prior to finalizing this RP/EA.

3.2 - Components Not Affected or Not Analyzed in this Document

The following components, identified as not being present, affected, or analyzed, are not brought forward for additional analysis in this Draft RP/EA:

- Social/Economic/Environmental Justice – No social or economic impacts are expected from the proposed restoration projects because of the remote location and types of projects proposed. There are low-income populations near proposed project areas, but these populations will not be adversely affected due to the intended beneficial environmental outcomes of the projects and use of some of the areas for recreation. The restoration is not expected to add significantly to the existing traffic patterns and there are no existing traffic congestion issues in the area.
- Recreation – Impacts to recreation are anticipated to be beneficial at project areas where public access will be allowed.
- Air and Climate – Proposed activities, including operation of heavy construction equipment, are not expected to produce air pollutants at levels to exceed state air quality standards.

Table 4. Summary of Environmental Consequences for Alternatives A-D, East Helena Smelter Site NRDAR, Lewis and Clark County, Montana.

Resource	Alternative A	Alternative B	Alternative C	Alternative D
Physical and Biological Resources				
Vegetation	No changes to existing vegetation communities.	Overall beneficial impacts to native wetland, floodplain, and grassland communities with short--term direct impacts during construction and plant community establishment.	Overall beneficial impacts to native grassland communities with short--term direct impacts during non-native species control treatments and plant community establishment.	Overall beneficial impacts to native grassland communities with short--term direct impacts during non-native species control treatments and plant community establishment.
Aquatic Resources and Water Quality	No changes to aquatic resources or water quality.	No changes in aquatic resources with appropriate best management practices (BMPs) to prevent movement of herbicides and sediment into waterways.	No changes in aquatic resources with appropriate BMPs to prevent movement of herbicides and sediment into waterways.	No changes to aquatic resources.
Threatened and Endangered Species	No changes to threatened or endangered species.	No impacts known.	No impacts known.	No impacts known.
Cultural Resources				
Cultural and Paleontological	None.	No impacts known. Trustee will coordinate with the Montana State Historic Preservation Office to complete Section 106 review prior to finalizing the RP/EA.	No impacts known. Trustee will coordinate with the Montana State Historic Preservation Office complete Section 106 review prior to finalizing the RP/EA.	No impacts known. Trustee will coordinate with the Montana State Historic Preservation Office to complete Section 106 review prior to finalizing the RP/EA.

3.3 - Evaluation of Environmental Consequences for Alternative A: No Action/Natural Recovery

The No Action/Natural Recovery Alternatives would have no adverse or beneficial environmental consequences, as no project would be implemented.

3.4 - Evaluation of Environmental Consequences for Alternative B: Native Grassland and Wetland Restoration Project along Prickly Pear Creek (Preferred)

Overall, the long-term beneficial impacts are anticipated to outweigh any short-term adverse impacts, as described in Table 4. This alternative would result in improved wetland, floodplain, and grassland habitats. Restored land would be managed to ensure long-term protection of wildlife habitat, particularly resulting in beneficial impacts to migratory birds. During construction activities, appropriate BMPs (e.g., silt fencing) will be implemented to prevent any adverse impacts to Prickly Pear Creek. Management of non-native and invasive species may require herbicide application. Herbicide use for the control of invasive plants could cause direct, short-term, moderate, adverse impacts to geology and soils, water, air, threatened and endangered species, and land use and recreation. These impacts would result from the potential for lethal effects on soil biota and the short-term loss of shading and habitat for prey species provided by the invasive plant. The potential impacts to birds, aquatic organisms, and terrestrial organisms will be mitigated by the use of the least toxic herbicides, surfactants, and spray pattern indicators available, but sub-lethal impacts are possible. These include impacts to reproduction, survival to adulthood, and disrupted food webs (NMFS 2005). Potential impacts to non-target plant species are reduced when proper application methods are prescribed, but rainfall and wind may cause herbicides to leach into the surrounding soil or be transported to non-invasive plants, causing unintentional damage. A project area may be treated several times per year, often for multiple years, to control regrowth of the invasive plant species. Where feasible, the area will be regularly monitored for regrowth of the target or new invasive species. Generally, use of herbicides in project areas would be conducted according to established protocols for the locality, as determined by a licensed herbicide applicator. Such protocols would implement BMPs, which include applying information and guidelines for appropriate chemical to be used, timing, amounts, application methods, and safety procedures relevant to the herbicide application.

3.4.1 - Conclusion on Alternative B

The Trustee anticipates this alternative to have primarily beneficial direct and indirect long-term impacts in the form of natural resource preservation and improved land management activities enhancing migratory birds. For these reasons, and those discussed in Section 2.2.2 above, Alternative B is a Preferred Alternative.

3.5 - Evaluation of Environmental Consequences for Alternative C: Native Grassland Restoration Project along Prickly Pear Creek (Preferred)

Overall, the long-term beneficial impacts are anticipated to outweigh any short-term adverse impacts, as described in Table 4. This Alternative would result in improved grassland habitat. Restored land would be managed to ensure long-term protection of wildlife habitat, particularly

resulting in beneficial impacts to migratory birds. During construction activities, appropriate BMPs (e.g., silt fencing) will be implemented to prevent any adverse impacts to Prickly Pear Creek. Management of non-native and invasive species may require herbicide application and is not expected to result in adverse impacts with appropriate BMPs in place to prevent movement of herbicide off-site (see Section 3.4).

3.5.1 - Conclusion on Alternative C

The Trustee anticipates this alternative to have primarily beneficial direct and indirect long-term impacts in the form of natural resource preservation and improved land management activities enhancing migratory birds. For these reasons, and those discussed in Section 2.2.3, Alternative C is also a Preferred Alternative. While this Alternative is preferred, it may be only partially implemented or not implemented depending on the availability of funds only after Alternative B is implemented. The Trustee will make the public aware of the status of implementation of Alternative C upon implementation of Alternative B.

3.6 - Evaluation of Environmental Consequences for Alternative D: Restoration of Migratory Bird Habitat on Federal Lands near East Helena, MT

Overall, the long-term beneficial impacts are anticipated to outweigh any short-term adverse impacts, as described in Table 4. This alternative would result in improved grassland habitat. Restored land would be managed to ensure long-term protection of wildlife habitat, particularly resulting in beneficial impacts to migratory birds. Management of non-native and invasive species may require herbicide application and is not expected to result in adverse impacts with appropriate BMPs in place to prevent movement of herbicide off-site.

3.6.1 - Conclusion on Alternative D

The Trustee anticipates this Alternative to have primarily beneficial direct and indirect long-term impacts in the form of natural resource preservation and improved land management activities enhancing migratory birds. For these reasons, and those discussed in Section 2.2.4, Alternative D is not a Preferred Alternative. However, Alternative D could be implemented in the event Alternative B or C becomes infeasible for reasons not known at this time.

3.7 - Cumulative Impacts

Cumulatively, the Preferred Alternatives are anticipated to have a long-term and beneficial impact. Terrestrial habitats for migratory birds will be restored or enhanced after potential minor to moderate short-term impacts to terrestrial natural resources and adjacent water bodies (e.g., Prickly Pear Creek). Terrestrial wildlife habitat conditions will improve as a result of improved native plant cover. Water and sediment quality may also be enhanced as a result of the restored wetland vegetation.

The Service considered the effects of past, present, and future actions in the vicinity of these restoration projects to evaluate if their cumulative impacts on the elements described in Section 2.1 would result in overall negative consequences. Adjacent actions to these restoration projects are briefly described in Table 5.

The Preferred Alternatives are not expected to result in significant cumulative impacts on the human environment since alone, or in combination with other current and future activities in the vicinity, they would not change the larger current hydrological patterns of discharge in Prickly Pear Creek, recreational use, economic activity, or land-use in the proposed project areas. Future activities within the geographic area of the Preferred Alternatives, either completed by Trustee agencies or other organizations, agencies, or groups, will enhance habitat that exists naturally.

There are several environmental regulatory activities ongoing at the Site that in combination with the proposed restoration activities described herein will provide additional cumulative benefits to the environment.

Table 5. Land Use Actions Adjacent to or Near the Preferred Alternatives. East Helena Smelter Site NRDAR, Lewis and Clark County, Montana.

DESCRIPTION	ACTION
The East Helena Prickly Pear Elementary School was built on 50 acres of land donated by the METG and opened in 2018.	The portion of land closest to Parcel 2 (Alternative B) is planned to be developed by the East Helena Public Schools into athletic fields. These lands are undergoing clean-up at this time (scraping soils and mixing, to reduce soil lead levels).
Highland Meadow Subdivision development to the east of Parcel 2.	Oakland Companies, Billings, MT, purchased a 100-acre parcel of land from the METG and is creating a 319 single-family home subdivision. A small floodplain buffer separates the residential subdivision from Parcel 2 (Alternative B). Remediation of these lands is substantially complete.
Establishment of the Prickly Pear Creek Greenway Corridor between Montana City and the Helena Regional Airport.	Recommended actions set forth in a Feasibility Study within the Prickly Pear Creek Greenway Corridor will be implemented in phases to create a system of trails along Prickly Pear Creek from Montana City to the Helena Regional Airport (CTA Architects and Engineers 2016). The Custodial Trust has documented its support for the Greenway Project, subject to the required approvals for conveyance of Prickly Pear Creek Greenway Project lands and funding for environmental actions.
Montana NRDP RP implementation.	This plan would propose groundwater, recreation, and instream/riparian restoration projects within the Prickly Pear Creek Watershed (NRDP 2019).

4.0 - MONITORING, PERFORMANCE CRITERIA, AND ADAPTIVE MANAGEMENT

4.1 - Monitoring and Adaptive Management

Monitoring will assess whether riparian and grassland habitats are sufficiently restored to meet restoration goals and objectives for migratory birds and if species of interest are occupying habitat enhancement areas. A project-specific monitoring plan will be developed to evaluate the long-term impacts of planned restoration actions. The monitoring plan will include performance standards and criteria, as well as a sampling and analysis plan, and a schedule for the frequency and duration of monitoring. Restoration goals will be guided by performance criteria, or measures that assess the progress of restoration sites. In this way, the Trustee will be able to determine if the restoration areas are on target, and if not, what actions and course corrections are needed to achieve restoration goals. Monitoring information may also be used by the Trustee as an outreach tool to illustrate to the public continued progress over time (quantitatively and qualitatively).

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REFERENCES

Axline, J. (2010). Cultural Resource Inventory and Assessment: ASARCO Residences in the Vicinity of the East Helena Smelter (24LC2036), Lewis and Clark County, Montana. Prepared For: The Montana Environmental Trust Group, LLC Trustee of the Montana Environmental Custodial Trust, 26pp.

Barker, W. T., & Whitman, W. C. (1988). Vegetation of the Northern Great Plains. *Rangelands, 10*(6), 266-272. Retrieved from https://www.jstor.org/stable/4000297.

Bradford, D. F., Franson, S. E., Neale, A. C., Heggem, D. T., Miller, G. R., & Canterbury, G. E. (1998). Bird Species Assemblages as Indicators of Biological Integrity in Great Basin Rangeland. *Environmental Monitoring and Assessment, 49*(1), 1-22. doi:10.1023/a:1005712405487.

CTA Architects and Engineers. (2016). Prickly Pear Creek Greenway Feasibility Study, 27pp.

EPA. (2005). Technical Memorandum, Supplemental Ecological Risk Assessment for the East Helena Smelter Site, Montana. USEPA with technical assistance from Syracuse Research Corporation, Denver Colorado. 47pp.

Henderson, D. C., & Naeth, M. A. (2005). Multi-scale Impacts of Crested Wheatgrass Invasion in Mixed-Grass Prairie. *Biological Invasions, 7*(4), 639-650. doi:10.1007/s10530-004-6669-x.

Hulet, A., Roundy, B. A., & Jessop, B. (2010). Crested Wheatgrass Control and Native Plant Establishment in Utah. *Rangeland Ecology & Management, 63*(4), 450-460. doi:10.2111/rem-d-09-00067.1.

METG. (2011) – Baseline Ecological Risk Assessment: Former ASARCO East Helena Facility East Helena, Montana. Prepared for Montana Environmental Trust Group, LLC, Trustee of the Montana Environmental Custodial Trust623 623pp.

MDEQ. (2017). Nutrient Pollution in the Lake Helena Watershed: A Status Update for the Water Policy Interim Committee – December 2017. 7pp.

MT FWP. (2014). Draft Environmental Assessment, Upper Prickly Pear Fishing Access Site Proposed Development. 35pp.

Montana Department of Health and Environmental Sciences, Water Quality Bureau. 1981. Prickly Pear Creek: A Report on Man's Debilitating Impacts. Edited by Charles Wood. MDHES, Helena, MT.

Montana Department of Justice, Natural Resource Damage Program (NRDP). (2019). East Helena Asarco Smelter Draft Restoration Plan and Environmental Assessment Checklist. 49pp.

National Marine Fisheries Service (NMFS). (2005). Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Pacific Northwest Region Invasive Plant Program, Oregon and Washington. September 8. Seattle, Washington.

Nesser, J.A, Ford, G.L., Maynard, C.L., & Page-Dumroese, D.S. (1997). Ecological Units of the Northern Region: Subsections. Gen Tech. Rep. INT-GTR-369. Ogden, UT: US Department of Agriculture, Forest Service, Intermountain Research Station 88pp.

Reynolds, T. D., & Trost, C. H. (1980). The Response of Native Vertebrate Populations to Crested Wheatgrass Planting and Grazing by Sheep. *Journal of Range Management, 33*(2), 122-125. doi:10.2307/3898425.

Reynolds, T. D., & Trost, C. H. (1981). Grazing, Crested Wheatgrass, and Bird Populations in Southeastern Idaho. *Northwest Science, 55*(3), 225-234.

US Census Bureau. "American Community Survey Summary File Data." *American Community Survey Summary File Data*, 22 Aug. 2018, www.census.gov/programs-surveys/acs/data/summary-file.html.

US Census Bureau. "County Population Totals and Components of Change: 2010-2018." *County Population Totals and Components of Change: 2010-2018*, 23 May 2019, www.census.gov/data/datasets/time-series/demo/popest/2010s-counties-total.html.

"U.S. Census Bureau QuickFacts: Lewis and Clark County, Montana; Broadwater County, Montana; Montana." *Census Bureau QuickFacts*, www.census.gov/quickfacts/fact/table/lewisandclarkcountymontana,broadwatercountymontana,MT/PST045218.

US Census Bureau. "SAIPE State and County Estimates for 2017." *SAIPE State and County Estimates for 2017*, 1 Mar. 2019, www.census.gov/data/datasets/2017/demo/saipe/2017-state-and-county.html.

USDOI-BLM. 2015. Iron Mask Planning Area Environmental Assessment (DOI-BLM-MT-B070-2013-0019-EA) 155 pp.

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