



June 19, 2006

To Whom It May Concern:

The Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601, et seq., (CERCLA), authorizes Federal, State, and Tribal governments to act as natural resource trustees and to determine injury and damages to natural resources resulting from releases of hazardous substances. Beginning in the early 1990s, the Departments of the Interior and Agriculture, and the Coeur d'Alene Indian Tribe (Trustees), initiated a CERCLA Natural Resource Damage Assessment to assess and quantify the scope of injuries to natural resources resulting from exposure to mining-related metals contamination in the Coeur d'Alene Basin (Basin) and to quantify the amount of damages to restore, replace, and/or acquire the equivalent of such injured resources. During the damage assessment process, the Trustees engaged in settlement discussions with a number of the companies potentially responsible for mining-related natural resource injuries in the Basin and reached settlements with some of those companies which reimbursed some of the Trustee assessment costs and recovered natural resource damages.

Consistent with CERCLA, the Trustees propose to use currently available settlement funds for several discrete projects in the Basin to partially compensate the public for natural resource injuries resulting from mining-related releases of hazardous substances, which included cadmium, lead, and zinc. The projects are described in the Trustees' Coeur d'Alene Basin Interim Restoration Plan. The Trustees herein provide notice that the proposed Coeur d'Alene Basin Interim Restoration Plan is available for public inspection and that the public may submit comments on the proposed plan during a 30-day period commencing on June 19, 2006. Any public comments on the proposed plan, or questions related to it, may be submitted to the Trustees by directing them to:

Brian L. Spears
U.S. Fish and Wildlife Service
11103 E. Montgomery Drive
Spokane, Washington 99206-4779
Telephone: 509 893-8032
Email: Brian_Spears@fws.gov

Very truly yours,

The Coeur d'Alene Basin Natural Resource Trustees.

Department of Interior _____ Date _____

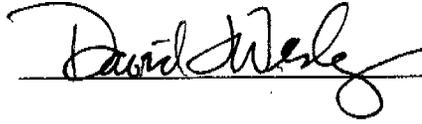
Department of Agriculture Thomas Pettigrew Date June 8, 2006

Coeur d'Alene Indian Tribe _____ Date _____

Very truly yours,

The Coeur d'Alene Basin Natural Resource Trustees.

Department of Interior



Date 6/14/06

Department of Agriculture

Date _____

Coeur d'Alene Indian Tribe

Date _____

Very truly yours,

The Coeur d'Alene Basin Natural Resource Trustees.

Department of Interior _____ Date _____

Department of Agriculture _____ Date _____

Coeur d'Alene Indian Tribe Phillip J. Carner Date June 14, 06



Draft Coeur d'Alene Basin Interim Restoration Plan

TRUSTEES: U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, Bureau of Land Management
U.S. Department of Agriculture, Forest Service
Coeur d'Alene Indian Tribe

LEGAL AUTHORITY: Comprehensive Environmental Response, Compensation and
Liability Act of 1980 (as amended)

Natural Resource Damage Assessment, 43 Code of Federal
Regulations, Part 11

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DATE: June 2006

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CHAPTER 1

BACKGROUND, PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Background

For over 100 years, the Coeur d'Alene River Basin (Basin) was one of the most productive silver, lead, and zinc mining areas in the United States, producing 7.3 million metric tons of lead and 2.9 million metric tons of zinc between 1883 and 1997 (Mitchell and Bennett, 1983; Long, 1998). The majority of mining and mineral processing in the Basin occurred along the South Fork of the Coeur d'Alene River and its tributaries (Mitchell and Bennett, 1983). The wastes generated by these operations contained metals, including lead, zinc, cadmium, and arsenic.

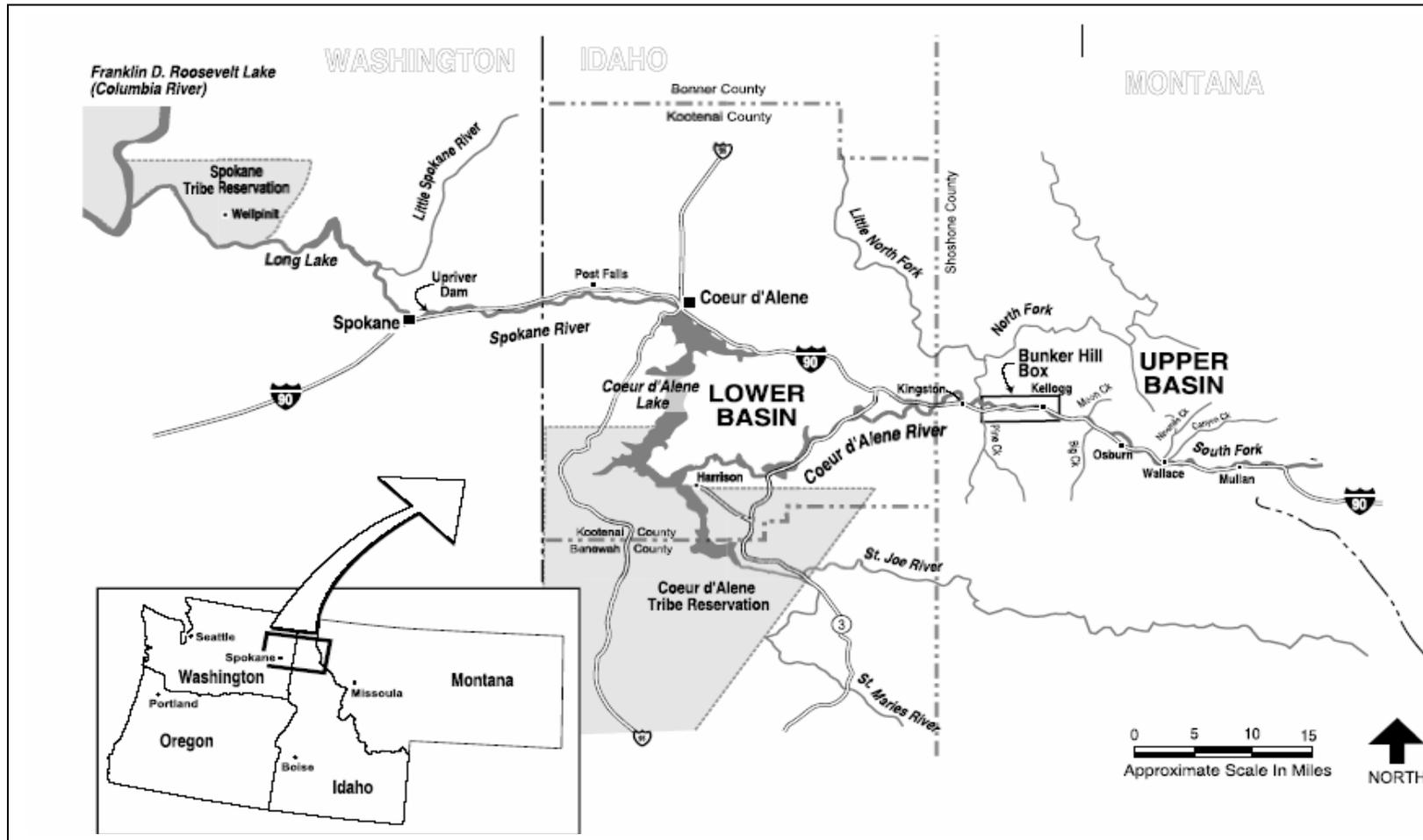
For most of the 20th century, these wastes were discharged directly into the river and tributaries or were deposited on lands and migrated into ground and surface waters. Mining products and wastes containing metals were also transported by train and other vehicles that spilled and tracked metals along travel routes in the Basin. Mining-related wastes were also taken from the mine and mill properties or hauled out of the floodplain areas for use in other applications throughout the Basin, including without limitation ballast for railroad lines, street and road surfacing, and concrete aggregate. As a result, mining-related waste rock, tailings, mine drainage, and contaminated floodplain deposits are continuing sources of metals contamination in the Coeur d'Alene Basin (Natural Resource Trustees, 1991; Ridolfi, 1998; and Stratus, 2000). Surface and ground water transports dissolved and particulate metals contamination to downstream surface waters, soils, and floodplain sediments (Beckwith et al., 1997; Ridolfi, 1995; Stratus, 2000; Weisel, 1981). Tailings and contaminated sediments are deposited in Coeur d'Alene River channel, levees, and floodplain, as well as in lakes and wetlands adjacent to the river (Campbell et al., 1999; Box et al., 1996; Fousek, 1996; Hoffmann, 1995; and Rabbi, 1994), and in Coeur d'Alene Lake (Woods and Beckwith, 1997; Horowitz et al, 1993, 1995a, 1995b). As a result, extremely elevated metals concentrations exist in soil, sediments, and waters throughout the Basin.

In 1983, the U.S. Environmental Protection Agency (USEPA) listed the Bunker Hill Mining and

Metallurgical Complex Superfund facility on the National Priorities List (NPL) in response to human health risks associated with mining-related metals contamination in the 21 square-mile area around the former Bunker Hill smelter, known as the “Box.” The facility includes mining-contaminated areas in the Coeur d’Alene River corridor, adjacent floodplains, downstream water bodies, tributaries, and fill areas, as well as the 21-square mile “Box” (USEPA 2002). See Figure 1. A ROD was signed for the populated areas of Bunker Hill Box (OU1) in 1991 (USEPA, 1991), and a ROD was signed for the non-populated areas of the Box (OU2) in 1992 (USEPA, 1992). USEPA did not select actions in the RODs for OU-1 and OU-2 to address sources of mining-related contamination outside of the Bunker Hill Box, leaving broader contamination and water quality issues in the Basin to be resolved through coordination of federal, state, tribal and local regulatory controls by the Coeur d’Alene Basin Restoration Project (“CBRP”). However, CBRP ultimately was unsuccessful in its efforts to systematically address contamination in the Basin.

In 1991, the U.S. Departments of Interior and Agriculture and the Coeur d’Alene Indian Tribe (“Trustees”) initiated a Natural Resource Damages Assessment (NRDA) to assess damages under CERCLA and the Clean Water Act, 33 U.S. C. 1321, for natural resource injuries resulting from exposure to hazardous substances, particularly lead, zinc, and cadmium in the Basin. Each of the Trustees qualifies under CERCLA and its implementing regulations as a trustee of injured natural resources in the Basin. 42 U.S.C. 9607(f). The Trustees developed the Basin NRDA consistent with the U.S. Department of Interior’s non-mandatory damage assessment regulations, 43 C.F.R. Part 11, Subpart E, as appropriate. Consistent with those regulations, the Trustees’ decision to conduct a full-scale damage assessment in the Basin was based upon the 1991 “Preassessment Screen of Natural Resource Damages in the Coeur d’Alene Watershed Environment from Mining and Related Activities Taking Place in and about the Bunker Hill Superfund Site.” The Trustees subsequently prepared and released the Phase I (Injury Determination) Assessment Plan (1993), and the Phase II (Injury Quantification and Damage Determination) Assessment Plan (1996). The results of the injury determination and quantification studies confirmed widespread distribution of mining-related contamination throughout the Basin and resulting natural resource injuries, and were described in the Trustees’ Report of Injury Assessment (2001), which documented that:

Figure 1. Coeur d'Alene Basin (from USEPA, 2002).



- (1) Concentrations of metals in floodplain soils of Canyon Creek, Ninemile Creek, and the South Fork Coeur d'Alene River (SFCDR) valley are phytotoxic and caused reduced riparian vegetative cover and habitat complexity, resulting in hundreds of acres of barren and sparsely vegetated floodplain soils and sediments (Stratus, 2000).
- (2) Concentrations of metals in surface water (Ridolfi, 1995; Ridolfi, 1999) exceed chronic and acute aquatic life criteria recommended by the USEPA [63 FR 68354]. Fish and other aquatic resources have been injured as a result of exposure to elevated metals (Ellis, 1940; Stratus, 2000); populations of trout and other fish have been reduced or eliminated from the SFCDR (Stratus, 2000).
- (3) Of the approximately 19,200 acres of floodplain habitat in the lower Basin, approximately 18,300 acres (95 percent) contain lead levels above those observed to cause negative physiological effects in waterfowl. Approximately 15,400 acres (80 percent) contain lead levels above those observed to kill waterfowl (USEPA, 2002). Ingestion of lead-contaminated sediments by waterfowl has resulted in extensive mortality and other adverse physiological effects (Beyer et al., 2000; Sileo et al., 2001).
- (4) Approximately 40 square miles, or 85 percent of lake bed sediments contain lead concentrations above values considered ecologically harmful.

In 1998, as the Trustees' NRDA studies were near completion, the USEPA initiated a CERCLA remedial investigation/feasibility study (RI/FS) into human and ecological risks from exposure to mining-related metals contamination in areas of the Basin located outside of the Box, identifying this area as "Operable Unit 3." USEPA's RI/FS findings and conclusions were consistent with those of the Trustees concerning the widespread geographic extent and impact of mining-related metals contamination on natural resources in the Basin.

In 2002, USEPA issued an interim ROD for Basin OU-3, specifying thirty-years of remedial actions in Basin areas upstream and downstream of Coeur d'Alene Lake at an estimated cost of \$359 million.¹ USEPA's cleanup plan focuses on source control and removal actions in these

¹ EPA did not select remedial actions for Coeur d'Alene Lake, deferring to the Coeur d'Alene Indian Tribe and the State of Idaho to develop and implement an updated lake management plan to monitor and address metals contaminated sediments in Coeur d'Alene Lake (USEPA 2002;

areas to reduce human and ecological resource exposures to mining contamination, particularly lead in soil and sediment and dissolved zinc and cadmium and particulate lead in surface waters. USEPA's cleanup actions may include surface water treatment to remove excess arsenic, cadmium, lead, manganese and mercury, excavation and removal of contaminated soils, permanent capping of contaminated areas, and/or reducing surface metal concentrations through surface-subsurface mixing.

In 2003, the U.S. District Court for the District of Idaho ruled that the Trustees established the liability of two non-settling mining company defendants, Asarco Incorporated and Hecla Mining Corporation, Incorporated, under CERCLA and the Clean Water Act for natural resource injuries resulting from the releases of mining-related metals contamination by those defendants into the Basin. The Court determined the scope of injuries includes:

- (1) surface and ground water,
- (2) soils and sediments,
- (3) riparian resources,
- (4) fish,
- (5) birds, i.e., tundra swans (*Cygnus columbianus*) that feed in the lower Basin, and
- (6) benthic macroinvertebrates and phytoplankton.

See Coeur d'Alene Tribe v. Asarco, Inc., et al., 208 F.Supp.2d 1094, 1106-1107, 1123-1124 (D. Idaho 2003).

The Trustees anticipate that implementation of the source control and removal measures identified in USEPA's interim ROD for Basin OU-3 may gradually reduce exposures of injured natural resources in the Basin to mining-related metals contamination. However, these actions will not compensate for public losses attributable to ongoing natural resource injuries and will not fully restore, replace, and/or acquire the equivalent of such injured natural resources.

1.2 Purpose

Under CERCLA, damages recovered from parties responsible for natural resource injuries are

Ridolfi and Falter 2004).

used “to restore, replace, or acquire the equivalent of the injured resources” (collectively “restoration” or “restoration activities”) 42 U.S.C. § 9607(f)(1). Accordingly, the Trustees have developed this proposed Draft Coeur d’Alene Basin Interim Restoration Plan (hereafter “Draft Interim Restoration Plan”) to identify restoration alternatives and to provide the public notice and opportunity to comment on those alternatives. The Trustees have reached consensus on the proposed alternatives described in this Draft Interim Restoration Plan in coordination with the State of Idaho.

This Draft Interim Restoration Plan is being proposed prior to final resolution of the Trustees’ natural resource damage claims against the remaining, non-settling, responsible parties to take advantage of opportunities to restore injured resources using currently available funding to implement interim restoration projects. The scope of restoration activity undertaken as a result of this Draft Interim Restoration Plan would depend on current and near future funds, property, and services made available through the resolution of natural resource damage claims. The proposed alternatives in this Draft Interim Restoration Plan are consistent with the funds currently available from the Trustees’ prior settlements with several potentially responsible parties in the Basin (approximately \$3 million dollars). Additional funds may also become available through requests for reimbursable funds that are submitted by the Federal Trustees to the ASARCO, Inc. Environmental Trust, which the company established through a judicially approved, partial settlement of certain nationwide environmental claims against it by the United States, and/or through Trustee settlements for natural resource damages with the remaining, non-settling, potentially responsible parties.

This Draft Interim Restoration Plan is not intended to quantify or to analyze the full extent of actions necessary to restore, replace, and/or acquire the equivalent of injured natural resources in the Basin. The Trustees intend to conduct the limited restoration actions proposed in this Draft Interim Restoration Plan between 2006 and 2008. The Trustees will continue to assess opportunities to enhance the scale of the restoration projects proposed in this Draft Interim Restoration Plan, as well as opportunities to conduct additional restoration projects, consistent with available funding. Consistent with the National Contingency Plan, the Trustees would implement the selected alternative in coordination with the remedial activities of USEPA and the

State of Idaho in the Basin. See Subpart G of the National Oil and Hazardous Pollution Contingency Plan. 40 CFR 300.600-615.

1.3 Restoration Planning

The Trustee's proposed Draft Interim Restoration Plan identifies actions intended to aid in returning injured natural resources to baseline condition. 43 CFR. §11.14(11)1. "Baseline" means the condition or conditions that would exist absent the release of hazardous substances 43 CFR §11.14 (e), and restoration to baseline conditions can be measured in terms of physical, chemical, or biological properties. 43 CFR §11.14(11)1. The Trustees' Draft Interim Restoration Plan proposes restoration projects that would go beyond the source control and hazardous substance removals contemplated under USEPA's 1991, 1992, and 2002 Records of Decision for OU-1, OU-2, and OU-3 in the Basin (USEPA 1991, 1992, and 2002) through actions aimed at restoring, rehabilitating or replacing physical, chemical, biological, and ecological attributes of natural resources that contribute to functional ecosystems.

Under the NRDA regulation, 43 C.F.R. §11.82, natural resource trustees should consider the following factors when selecting which of the proposed restoration alternatives to pursue:

- (1) technical feasibility;
- (2) relationship of the expected costs of the proposed actions to expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources;
- (3) cost-effectiveness;
- (4) results of actual or planned response actions;
- (5) potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources;
- (6) natural recovery period;
- (7) ability of the resources to recover with or without alternative actions;
- (8) potential effects of the action on human health and safety;
- (9) consistency with relevant federal, state and tribal policies; and

(10) compliance with applicable Federal, State and Tribal laws.²

The Trustees intend to consider these factors, as appropriate, in the process of selecting which of the alternatives in the proposed Draft Interim Restoration Plan to pursue.

Under CERCLA, any funds used by the Federal Trustees to implement a selected alternative that involves habitat and species restoration are subject to the requirements of the National Environmental Policy Act (NEPA). 42 U.S.C. § 4321. The Federal Trustees will complete the NEPA analysis and decision processes in consultation with the Tribe after the close of public comment on the Trustees' Draft Interim Restoration Plan.

After consideration of comments submitted during the public comment period, and the aforementioned NEPA analysis and decision processes, the Trustees will select one of the proposed interim restoration alternatives to pursue. Consistent with the National Contingency Plan, the Trustees would implement the selected alternative in coordination with the remedial activities of USEPA and the State of Idaho in the Basin. See Subpart G of the National Oil and Hazardous Pollution Contingency Plan. 40 CFR 300.600-615.

To implement the selected restoration alternative, the Trustees may choose to establish partnerships through agreements with other parties and organizations to assume title to lands or to preserve those lands. By doing so, the Trustees do not intend to delegate trustee responsibilities or authorities to such parties or organizations.

As noted above, the Trustees' proposed Draft Interim Restoration Plan does not address the full extent of restoration that is needed to fully restore, replace, and/or acquire the equivalent of

² Restoration activities described by this Interim Restoration Plan would be consistent with site-specific Applicable or Relevant and Appropriate Requirements (ARARS), which may include Federal, State and/or Tribal laws. ARARS would be evaluated to determine whether restoration activities would have adverse effects on unique site-specific characteristics, such as historic or cultural resources, park, recreation or refuge lands, wilderness areas, wild or scenic rivers, sole or principal drinking water aquifers, prime farmlands, wetlands, floodplains, ecologically important areas, or candidate, threatened or endangered species.

injured natural resources in the Basin. However, interim restoration activities proposed herein are consistent with expert reports that were submitted in the Trustees' natural resource damages litigation and evaluate a broad array of actions to restore, replace, and/or acquire the equivalent of injured natural resources in the Basin.

1.4 Public Participation

Consistent with CERCLA, the Trustees are proposing this Draft Interim Restoration Plan and are making it available for public review and comment. Notice of the public's opportunity to submit comment on the Draft Interim Restoration Plan will be posted on June 19, 2006 at the internet sites of U.S. Fish and Wildlife Service (<http://www.fws.gov/pacific/ecoservices/envicon/nrda/restoration.html> or <http://www.fws.gov/easternwashington>). Links to this announcement will be available on the internet sites of: the U.S. Forest Service (<http://www.fs.fed.us/ipnf/eco/projects.html>), the Bureau of Land Management (<http://www.id.blm.gov/>), and the Coeur d'Alene Tribe (http://www.cdatribe-nsn.gov/lake/p_damage.shtml). Such notices will also be published on that date in local newspapers, including the Spokesman Review and the Coeur d'Alene Press.

The proposed Draft Interim Restoration Plan will be available for download from the U. S. Fish and Wildlife Service at the internet site listed above and links to the proposed Draft Interim Restoration Plan will be available on the other government internet sites listed above. Hard copies will be available for review during normal business hours at the Upper Columbia Fish and Wildlife Office (11103 E. Montgomery Drive, Spokane, Washington 99206) and the Coeur d'Alene Tribe NRDA Office (424 Sherman Avenue, Coeur d'Alene, Idaho, 83814).

Following the close of the public comment period on the Draft Interim Restoration Plan, the Federal Trustees, in consultation with the Coeur d'Alene Tribe, will comply with NEPA requirements applicable to Federal actions proposed under the Draft Interim Restoration Plan.

Comments on this proposed Draft Interim Restoration Plan must be received in the U.S. Fish and Wildlife Office in Spokane, Washington 30 days from the date on which public notice is issued

(June 19, 2006). Written comments should be sent to:

Brian L. Spears,
U.S. Fish and Wildlife Service,
Upper Columbia Fish and Wildlife Office,
11103 East Montgomery Drive, Spokane, WA 99206,

The administrative record regarding this Draft Interim Restoration Plan is being maintained at the Coeur d'Alene Tribe NRDA Office, 424 Sherman Avenue, Coeur d'Alene, Idaho, 83814.

CHAPTER 2

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Alternative A: No Action – Natural Recovery

The Trustees, under the No Action-Natural Recovery alternative would not at this time initiate specific actions to compensate the public for losses attributable to continuing injuries resulting from on-going releases of mining-related hazardous substances in the Basin. The USEPA would continue to implement the agency's Records of Decision for operable units 1, 2, and 3 (USEPA, 1991, 1992, and 2002). Under Alternative A, it is estimated that recovery of the Coeur d'Alene Basin ecosystem could take several centuries following USEPA's response actions (Ridolfi and Falter, 2004 and USEPA 2002). While USEPA's response actions will facilitate recovery, specific restoration actions are needed to restore, replace and/or acquire the equivalent of injured natural resources in the Basin.

2.2 **Alternative B Proposed Restoration Activities Selection Criteria**

2.2.1 Background

CERCLA authorizes natural resource trustees to replace or acquire natural resources equivalent to those injured by hazardous substance releases, in lieu of or in addition to, direct restoration of the injured resources. Natural resources may also be rehabilitated with actions that increase the ecological integrity or viability of resources. Fish and aquatic biota that occur within the Coeur d'Alene Basin have been injured by the release of mining-related metals. It is the intent of the Trustees to implement restoration actions that address aquatic biota resources injured by downstream transport of mining-related contaminated water and sediments in the Coeur d'Alene Basin. Injured aquatic biota inhabiting the Coeur d'Alene Lake ecosystem may use many Coeur d'Alene Lake tributaries, including the Coeur d'Alene and St. Joe Rivers. Alternative B, therefore, proposes projects in a number of river and creek systems whose restoration/enhancement would support the rehabilitation of the Basin's aquatic resources. The

reestablishment and restoration of wetlands and their ecologically associated uplands would begin to help replace services for impaired fish and aquatic biota in the Coeur d'Alene Basin ecosystem, ultimately aiding in their recovery. Tundra Swans that feed in the lower Coeur d'Alene Basin have been injured from hazardous substances released from mining and mineral processing in the Coeur d'Alene Basin. Alternative B involves projects that would begin to provide ecosystem services to Tundra Swans through the preservation, reestablishment, restoration and/or enhancement of wetland habitat safe for use by Tundra Swans. Preservation, reestablishment, restoration and/or enhancement of wetland habitat would serve as partial compensation for injury to Tundra Swans.

2.2.2 Selection Criteria for Proposed Projects

In developing a list of proposed interim restoration projects that address injuries to natural resources within the Coeur d'Alene Basin, the Trustees considered all known related potential projects. Available damage funds, available willing landowners and costs influenced potential project opportunities and ultimate proposed project selection by the Trustees. Priorities for evaluating potential projects were influenced by several considerations:

- (1) injured natural resources (U.S. District Court, 2003);
- (2) quality of restoration opportunities (areas with substantial ecological opportunities);
- (3) relationship to losses (areas with restoration opportunities that address services and values similar to those lost due to the release of metals are preferred);
- (4) ecological value of target habitats;
- (5) cost-effectiveness (projects with lower cost per services or values are preferred);
- (6) currently available damage funds with which to conduct restoration;
- (7) potential for habitat quality improvement;
- (8) minimal metal contamination and low propensity for recontamination are preferred; and
- (9) ownership/protection opportunities.

Potential projects were further evaluated in consideration of factors described in sections 1.2 and 1.3. Projects also received higher priority for their ability to utilize funds with time sensitive

limitations (i.e., ASARCO Inc., trust fund). Costs outlined in Stratus (2004) were followed in initial restoration planning and project selection. Under Alternative B, the Trustees would continue to seek partnerships for cost sharing on proposed projects as design and implementation proceeds. The Trustees intend to implement the restoration/enhancement projects that are proposed below as Alternative B during the 2006 through 2008 period and would serve to partially compensate for public losses associated with identified natural resources injuries in the Basin (U.S. District Court, 2003).

2.3 Alternative B: Proposed Interim Restoration Projects (Preferred Alternative)

Alternative B is the preferred alternative and includes several discrete restoration projects. A summary of the Alternative B proposed interim restoration projects, estimated cost, lead trustee and specific Coeur d'Alene Basin injured resource that is addressed is provided in Table 1 (See page 28).

2.3.1 Pine Creek Restoration Project (\$600,000)

2.3.1.1 Background

The Pine Creek watershed covers approximately 79 square miles in the St. Joe Mountains. Pine Creek joins the South Fork Coeur d'Alene River at Pinehurst in Shoshone County, Idaho. Elevations range from 6408 feet on Latour Peak to 2160 feet at the confluence with the South Fork Coeur d'Alene River.

Pine Creek has two principal forks, which join about 6 miles upstream of Pinehurst. The West Fork drains 39 square miles, with an average gradient of 1.5 percent in its main channel over the 5.5-mile reach from the Calusa Creek confluence to the East Fork confluence. Its principal tributaries are Ross Gulch, Langlois Creek, Middle Fork, and Calusa Creek. The East Fork is the smaller fork, draining approximately 35 square miles, with an average gradient of 1.7 percent over the 3.9-mile reach from the Douglas Creek confluence to the West Fork confluence. The East Fork basin is sparsely inhabited, but contains many mine sites reflecting intensive historical

activity. Its principal tributaries are Highland Creek, Douglas Creek, Trapper Creek, and Hunter Creek.

Hard rock mining began in the catchment of Pine Creek near the end of the 19th century and has contributed to increased tributary bedload yield (Kondolf et al., 2000). Kondolf et al. (2000) conducted a field investigation, collecting pebble counts to characterize bedload and differentiate between the darker colored, semi-angular mining waste rock and the lighter colored and more rounded native alluvial material. They also analyzed aerial photos from 1933 through 1997 and compared the width of the unvegetated active floodplain. Increased bedload migrating to the channel, combined with removal of large cedar trees on the floodplain, resulted in channel instability, which propagated downstream over a period of decades. On many reaches of Pine Creek, active channel width has increased by over 50 percent since 1933.

BLM has conducted activities along Pine Creek since 1996 including: metals removal actions, installation of off-channel water treatment projects, construction of temporary tailings storage areas, floodplain grading/channel realignment, armoring of road sides, and revegetation of stream banks. Pine Creek is a priority drainage for remedial actions in the USEPA OU-3 ROD (USEPA, 2002). The proposed natural resource restoration would complement the completed activities by re-vegetating and reducing erosion on sites where contaminated materials have been removed.

2.3.1.2 Proposed Restoration

Pine Creek restoration activities identified herein are designed to augment activities already ongoing. This proposal does not represent restoration of Pine Creek and its tributaries in their entirety. Rather, this proposal would provide partial additional funding required toward complete restoration and monitoring.

The premise guiding Pine Creek restoration is that sediment source control and revegetation of the floodplain will eventually restore the stability of the watershed. Pioneer species will provide the initial stability of floodplain deposits and channel alignment necessary to reduce sediment

inputs. Pine Creek supports a variety of fish species including sculpin (*Cottus sp.*), brook trout (*Salvelinus fontinalis*) and westslope cutthroat trout. Restoration of riparian and aquatic habitat, compatible with treatments suited for the flow and sediment regime, is a primary objective in the overall Draft Interim Restoration Plan.

This project builds on field interpretations and recommendations contained within several previous studies. Following the floods of 1996, which caused substantial damage to infrastructure and resources within the Pine Creek drainage, BLM commissioned a reconnaissance level geomorphic investigation to identify sediment sources and feasibility of flood damage restoration (Kondolf and Matthews, 1996). A follow-up field investigation and report was commissioned to develop a conceptual restoration plan balancing the need to protect existing infrastructure with the goal of accelerating the natural recovery of the stream system towards a properly functioning condition (Matthews and Kondolf, 1996). That plan laid out the basis for development of restoration considerations for Pine Creek as part of Alternative B.

Approximately 13.6 stream miles of Pine Creek and its tributaries are targeted for restoration activities. Target stream reaches include all, or parts of, the following delineated stream reaches:

East Fork Pine Creek and tributaries

- 0.8 miles of the East Fork Pine Creek below Gilbert Creek to Douglas Creek
- 0.3 miles of Douglas Creek
- 0.6 miles of the East Fork Pine Creek from Douglas to Blue Eagle Creek
- 0.5 miles of the East Fork Pine Creek from Blue Eagle to Highland Creek
- 0.6 miles of Lower Highland Creek
- 0.5 miles of Middle Highland Creek
- 0.9 miles of Red Cloud Creek to Sidney Mine
- 0.2 miles of Upper Highland Creek

- 0.6 miles of the East Fork from Highland to Denver Creek³
- 1.0 mile of Denver Creek from Pine Creek confluence to Little Pittsburgh mine
- 0.9 miles of the East Fork from Denver to Nabob Creek
- 0.5 miles of Trapper Creek
- 0.4 miles of Nabob Creek
- 1.3 miles of the East Fork from Nabob Creek to the West Fork Confluence

West Fork of Pine Creek and tributaries

- 2.0 miles of the West Fork Pine Creek from Calusa Creek to Langlois Creek
- 0.5 miles of the West Fork from Langlois Creek to Upstream Levee Bridge
- 2.0 miles of the West Fork from Upstream Levee Bridge to East Fork confluence

Whether a particular reach of Pine Creek is recovering towards a narrower and less braided channel, or continuing to widen or aggrade, restoration efforts would be designed to allow for dynamic adjustment towards geomorphic equilibrium (also referred to as channel stability). Geomorphic equilibrium exists when the processes of bank erosion and channel migration occur gradually. Use of a combination of non-deformable treatments and deformable banks is one conceptual treatment that may be applied for heavily impacted stream reaches.

Restoration/stabilization techniques already in use and proposed for future work includes:

- stabilizing major off-channel sediment sources (i.e., rock dumps, tailings piles; oversteepened banks, failing roads adjacent to the channel);
- installing groins, barbs, and anchor points to re-direct flow, protecting eroding banks;
- armoring banks to protect infrastructure and set a limit to excessively wide or poorly defined channel migration corridors;
- installing floodplain grade controls to help stabilize mobile floodplain deposits and allow vegetation establishment;

³ Restoration work would be done near the mouth of Denver Creek where the Bureau of Land Management has completed removal actions. Work on the upper stream reaches would not be done until after completion of remedial projects.

- revegetating the riparian floodplain;
- adding soil amendments including composting, increasing litter, soil supplements (topsoil, fertilizer, etc.) to assist revegetation;
- modifying channels to stabilize the streambank and direct flow;
- conducting instream enhancement to improve fisheries habitat using large woody debris; including engineered log jams, anchor points, and roughness trees;
- continuing presence/absence fisheries population work to establish baseline and reference information; and
- constructing off-channel spawning and rearing habitat.

Subsequent and ongoing project implementation and review, as well as additional studies and monitoring, would be included in this project. As more is learned about the Pine Creek system and its response to various reclamation treatment methods, the plan would be adapted to the most efficient and effective treatments. The recently published Integrated Stream Protection Guidelines, (Washington State, 2003) would be used as a primary guidance tool for selecting treatments and monitoring methods where applicable within the Pine Creek drainage. The Integrated Stream Guidelines are endorsed by the State of Washington, Army Corps of Engineers Regulatory Branch, and the U.S. Fish and Wildlife Service. Monitoring of the effectiveness and costs of various treatments will provide feedback to assess feasibility of transferring successful methods to other areas within the Coeur d'Alene River Basin.

2.3.2 Moon Creek Restoration Project (\$25,000)

2.3.2.1 Background

From 1998 through 2000 the United States Forest Service (USFS) implemented a \$1.9 million removal action at the abandoned 20 acre Silver Crescent Mine and Mill Complex in the East Fork of Moon Creek. The mine and mills at the site historically processed lead, zinc, and silver ore with both an early jig mill and a more recent ball mill with a flotation plant. The main construction phase of the USFS removal action moved over 130,000 cubic yards of material contaminated with lead, arsenic, copper, and mercury into an on-site capped repository.

Removal action tasks accomplished include the following:

- Removal of public health hazards
- Removal of contamination sources
- Tailings, waste rock, and contaminated soil relocated into an on-site capped repository
- Stream channel relocation and reconstruction
- Riparian and upland revegetation
- Erosion control and stabilization

Monitoring results from groundwater and surface water samples strongly indicate an increase in water quality due to a reduction in metals contaminants. With the exception of dissolved zinc concentrations measured at 0.2 ppm (approximately 4 times the chronic aquatic life criteria) in low flow surface water conditions, all other metal concentrations measured in surface waters through the site have been below human health and chronic aquatic life criteria, representing a large improvement. It is anticipated that the zinc levels within Moon Creek will continue to decline as removal action benefits continue to accrue. Existing zinc levels are not prohibitive in planning fish habitat restoration because those levels exceed chronic aquatic life criteria only during low flow periods and in a localized area. Monitoring for changes in water quality will continue to occur.

With an increase in water, soil, and sediment quality and all human health concerns addressed at the site, the East Fork of Moon Creek has potential for fisheries, wildlife, and terrestrial restoration. The entire site is in winter range for big game and the East Fork of Moon Creek provides valuable spawning and rearing habitat for westslope cutthroat trout (*Oncorhynchus clarki lewisi*) in the South Fork of the Coeur d'Alene River drainage.

During the removal action construction process, the stream channel, floodplain, and flood-prone area were greatly altered. Over 3000 feet of the East Fork of Moon Creek's channel needed to be moved several times in order to remove tailings, waste rock, and contaminated soils.

Although contaminants at the site have been addressed and the disturbed area is relatively stable, the channel and floodplain areas are still in need of restoration work in order to achieve pre-

mining habitat quantity and quality. The following natural resource restoration would complement and build upon the remedial work by vegetating and stabilizing the stream channel and riparian zone within remediated areas.

2.3.2.2 Proposed Restoration

Moon Creek restoration activities identified herein are designed to augment activities already ongoing. Current funding for restoration work at the Silver Crescent Mine in the East Fork of Moon Creek is provided by the U.S. Forest Service, Coeur d'Alene Basin Environmental Improvement Project Commission, and the Trustees. Current work is part of an existing U.S. Forest Service CERCLA Removal Action. This proposal would provide partial additional funding required for some of the total project monitoring and maintenance. It is the intent of the Trustees to provide that funding during fiscal years 2006 to 2008.

Currently the US Forest Service, Bureau of Land Management, Coeur d'Alene Tribe, and US Fish and Wildlife Service have committed a combined \$70,000 of restoration settlement funds towards the project to cover planning, design, administration, and oversight. Clean Water Act funds (over \$300,000) would be used for the on the ground construction and vegetation work as well as to cover some monitoring costs. This Draft Interim Restoration Plan would add funds (\$25,000) to the Moon Creek project monitoring program to help achieve more robust monitoring at the site.

Restoration/stabilization techniques already in use and proposed for future work includes:

- vegetative restoration
- installation of wildlife habitat structures
- installation of fish habitat structures
- stream channel enhancement
- installation of grade controls
- control of noxious weeds

It is anticipated that at least five years of post restoration monitoring would be conducted along the target location. Monitoring of the effectiveness and costs of various treatments would provide feedback to assess feasibility of transferring successful methods to other areas within the Coeur d'Alene River Basin. The following components would be evaluated to quantify project accomplishments:

- fish tissue and songbird blood lead surveys to evaluate ongoing contaminant exposure (includes upstream and downstream areas);
- fish population monitoring;
- fish habitat surveys to monitor the quality and dynamics of restored fish habitat;
- permanent benchmarks set up during contract preparation for cross section/longitudinal profile monitoring;
- stationary photo points for vegetative and riparian habitat monitoring.

The Silver Crescent Mine and Mill site would be the first sizable site in the Coeur d'Alene River Drainage to be cleaned up and restored to pre-mining conditions that support functioning wildlife and fisheries habitat. Once this project is complete, future maintenance is anticipated to be minimal. The site would be more stable, with fish and wildlife habitat improving over time. Any future maintenance needs at the site would be the responsibility of the USFS.

The project meets the restoration desires of all the Trustees. All permits and consultations have been achieved as part of the removal action process. Additional scoping on this final phase of work would be accomplished before implementation with appropriate agencies, organizations, and community members/groups.

2.3.3 Sherlock Creek Restoration (\$200,000)

The USFS is currently planning restoration in Sherlock Creek, located in the upper St. Joe River drainage. Sherlock Creek is the location of a large placer mining site and restoration of the related disturbance is estimated at nearly \$2 million. Following the resolution of some remaining legal issues, project specific NEPA and planning will take place before restoration

activities begin. The Trustees would provide funds (\$200,000) to be used on the initial phases of this project.

2.3.4 Coeur d'Alene Indian Reservation Enhancement Projects

The following proposed projects would occur on the Coeur d'Alene Indian Tribe Reservation. Potential project activities include fee title and/or land preservation agreement purchase or restrictive covenants of target areas. While the provisions of each purchase are tailored to the particular property, the Coeur d'Alene Tribe would be vested with the power to regulate the uses and disposition of acquired property and responsibility for the management of maintenance and protection measures.

Sections 2.3.4.1 to 2.3.4.3 contain Trustee target areas for aquatic habitat enhancements within Reservation boundaries. Additional specifics regarding Reservation restoration projects are included in the Coeur d'Alene Tribe Fish and Wildlife Research Monitoring and Evaluation Plan (Vitale et al., 2002a) and the Coeur d'Alene Tribe Fish and Wildlife Program Habitat Protection Plan (Vitale et al., 2002b).

Monitoring of habitat enhancement efforts within Reservation boundaries would be included in restoration projects. Monitoring will provide data for baseline characterization, risk assessment, trend assessment and activity performance evaluation. Data from simultaneous monitoring of selected control streams would provide information on the effectiveness of enhancement activities as they pertain to improvements in quality of habitat and aquatic biota community characteristics.

2.3.4.1 Alder Creek (\$660,000)

The heavily forested Alder Creek watershed encompasses 17,286 acres and contains 70.4 miles of stream habitat. The Coeur d'Alene Tribe has identified areas within the Alder Creek watershed as high priority for ecological protection.

Alder Creek flows east and north across the Coeur d'Alene Indian Reservation into the St. Maries River. Alder Creek historically supported westslope cutthroat trout, and currently supports resident cutthroat and brook trout populations (Anders et al., 2003). Alder Creek flows through pasture for approximately one mile downstream of the Alder Creek/North Fork of Alder Creek confluence. Alder Creek has downcut approximately four vertical feet into the floodplain along this reach.

Restoration of Alder Creek would benefit Coeur d'Alene Lake adfluvial cutthroat trout populations. (Adfluvial fish utilize lake environments to feed and mature, and migrate into inflowing streams to spawn.) Successful restoration requires streambed reconstruction to halt vertical downcutting. Proposed restoration activities include:

- purchasing the high priority protection areas to conduct stream restoration/enhancements;
- raising the creek bed approximately two feet along downcut stretches;
- installing grade control structures;
- reshaping stream banks;
- constructing off-channel water storage/flood areas;
- revegetation.

2.3.4.2 Benewah Creek (\$600,000)

The Benewah Creek watershed covers approximately 33,800 acres and includes 136.2 miles of stream habitat. Eighty-eight percent of the watershed is forested and 11 percent is agricultural land. The Coeur d'Alene Tribe has identified areas within the Benewah Creek watershed as high priority for ecological protection.

Benewah Creek flows north and east across the Coeur d'Alene Indian Reservation and into Coeur d'Alene Lake via Benewah Lake. Benewah Creek supports a significant resident adfluvial fish population, including westslope cutthroat trout, but has been closed to fishing since 1994 (Anders et al., 2003).

Restoration of Benewah Creek would benefit Coeur d'Alene Lake adfluvial cutthroat trout populations. Proposed restoration activities identified for Benewah Creek include:

- high priority habitat acquisition by the Coeur d'Alene Tribe for ecological protection and enhancement;
- comprehensive stream channel habitat quality evaluation;
- stream channel reconstruction to halt/repair incisions;
- installing grade control structures;
- revegetation.

2.3.4.3 Hepton Lake (\$300,000)

The Coeur d'Alene Tribe owns the Hepton Lake property consisting of 1,350 acres located within the Reservation at the southern end of Coeur d'Alene Lake, of which 1,187 acres are enrolled in the Wetland Reserve Program. The majority of the property is flooded pasture used by a variety of wildlife species. High waterfowl use, including use by tundra swans, has been documented on the property. The property also provides important habitat for bald eagles (*Haliaeetus leucocephalus*). Initial surveys and habitat assessments must be completed before major restoration activities can be conducted. These activities would include:

- property boundary survey;
- hazardous materials surveys and disposal;
- cultural resources inventories;
- hydrologic assessment to determine the potential to restore a diverse assemblage of wetland communities;
- management plan development to guide restoration, enhancement, operation and maintenance, and monitoring/evaluation activities.

Anticipated tasks associated with operations and maintenance would include:

- removal of fencing, debris and structures that pose safety hazards and diminish the property's potential to provide fish and wildlife habitat;
- installation of boundary fencing and gates at access points to minimize unauthorized access and disturbance to fish and wildlife;
- installation of public education signs at boundary points;
- management of noxious weeds.

Enhancement/restoration activities would be guided by a site-specific management plan. These activities could be costly if engineering is involved for activities such as design of water control structures, wetland excavations and island building. Anticipated enhancement/restoration activities would include:

- obtaining necessary permits;
- installing water control structures;
- planting native wetland and riparian vegetation to restore emergent, scrub-shrub and forested wetlands.

2.3.5 Restoration of Tundra Swans: Wetland-Based Restoration

2.3.5.1 Background

Tundra Swans within the Pacific Flyway population nest in western and northwestern Alaska and winter in central California, migrating along one of two routes through Idaho. The northern Idaho migration route includes the Coeur d'Alene Basin, St. Joe River Basin, and Kootenai National Wildlife Refuge. The southern route includes areas in southeastern Idaho (Pacific Flyway Council, 2001 as cited in Trost, 2004).

Tundra Swans utilizing the Coeur d'Alene Basin as a stopover point during migration are primarily exposed to lead through ingestion of lead-contaminated sediment while feeding (Beyer et al., 1998; Audet et al., 1999a). Approximately 5,362 wetland acres within the Lower Coeur d'Alene Basin were determined to be used by Tundra Swans as feeding habitat (Ridolfi, 2004),

and approximately 95 percent of the palustrine habitat in the Lower Basin contains surface lead concentrations above levels toxic to waterfowl. Tundra Swans are exposed to concentrations of lead within the Basin sufficient to cause death (Beyer et al., 1997; Beyer et al., 2000; Sileo et al., 2001).

Tundra Swan mortality has been recorded in the Basin since 1929 and continues today (Trost, 2004). Estimated Tundra Swan mortality due to lead poisoning unrelated to lead artifacts (i.e., hunter lead shot) from 1981-2004 averaged 150/year (Trost, 2004). Kern (in Trost, 2004) developed a population model to convert estimated Tundra Swan mortality to lost swan-years due to non-artifactual lead poisoning within the Basin. Factors used in calculating lost swan years included (1) years lost by swans killed, based on the average life span of Tundra Swans, and (2) the estimated loss of lifespan years of the first generation progeny of adult Tundra Swans killed. The final estimate was that 40,000 swan-years have been lost between 1981 and 2004. Yearly Tundra Swan mortalities are expected to continue, but are expected to be reduced depending on remediation and restoration activities taken within the Basin (Trost, 2004).

The Trustees propose to compensate the public for ongoing Tundra Swan injury caused by the release of mining-related metals by providing clean swan feeding areas through the reduction of sediment lead concentrations to levels that are below those that affect swans (preserve, reestablish, restore and/or enhance wetland habitat safe for use by Tundra Swans). Proposed activities include the acquisition and/or restoration of resources associated with injured wetlands, restoring wetland structure, function, and services to Tundra Swans. The goal of projects conducted in the Basin would be the reduction of Tundra Swan year losses due to reduced lead related mortality.

Wetland reestablishment, restoration and enhancement will help replace services to Tundra Swans within the Basin that have been injured from mining-related metals release. Functioning wetlands will provide areas for feeding, loafing, and roosting for Tundra Swans. To preserve wetlands, Trustees will focus on wetland acquisition or acquisition of land preservation agreements on wetlands or historic wetland areas of high natural quality. Final selection of specific areas that would be preserved will include consideration of the ecological value of the

wetland habitats, inherent improvement of water quality, ownership/protection opportunities, geographic/ecological diversity, local/regional planning, citizens' concerns, and the ability to find willing landowners. Preservation will be obtained through fee title or land preservation agreement purchase.

Target restoration areas include wetland or potential wetlands, which provide habitat or services for Tundra Swans. Activities may include wetland or wetland land preservation agreement acquisition, reestablishment of historic wetlands, and restoration of remediated wetlands.

Selecting a mix of projects allows for more flexibility for cost-effectiveness and feasibility due to different constraints related to the ecology of the area, wide spread contamination, or ability to find willing participants and sellers.

Wetland reestablishment efforts would be focused on areas where hydrological alterations or other modifications have destroyed or impaired former wetland habitat. This proposed action is more cost efficient and functionally effective than wetland creation where wetlands have not previously existed. Primary strategies may include, but not be limited to, low impact techniques such as: closing off/filling drainage ditches, disrupting (or not repairing) drain tile systems, constructing flap gates to limit river-caused flooding, and reestablishing wetland plants and other native vegetation in order to reestablish historic natural characteristics.

Restoration activities would be designed with the end goal of producing a functional wetland with characteristics similar to local, unimpaired wetland sites providing services to Tundra Swans. Initial target site characteristics may range in habitat quality and include a need for habitat reestablishment or metals remediation (i.e., sediment removal). In contrast, a site may already resemble a native functioning wetland. Restoration activities therefore could range in required intensity and effort, from the initial establishment of functioning water regimes and vegetation establishment to low maintenance vegetation species management. Overall, activities could include, but would not be limited to, water management alteration, mechanical and chemical vegetation control, wetland plant introduction/enhancement and wetland characteristic monitoring.

2.3.5.2 Coeur d'Alene Basin Tundra Swan Wetland Restoration Projects (\$900,000)

The U.S. Fish and Wildlife Service is currently identifying areas suitable for wetland remediation and/or restoration in the Coeur d'Alene Basin. The USEPA OU-3 ROD (USEPA, 2002) specified cleanup actions within the Basin that would provide 4,500 acres of safe waterfowl feeding areas. This includes clean-up of approximately 3,000 acres of contaminated palustrine and lacustrine habitat (i.e., 0-3 feet and 3-9 feet, respectively) and cleanup and conversion of 1,500 acres of agricultural lands to wetlands. Remedial actions would reduce waterfowl ingestion of sediment contaminated with lead and other metals.

Proposed restoration work is intended to supplement cleanup actions described in the ROD as well as conduct wetland restoration in other clean areas, leading to safe, functioning wetlands for Tundra Swans. Natural resource damage funds are needed for wetland restoration following remediation, including wetland design, purchase and management of land preservation agreements on restored areas, implementation of wetland conversions, and monitoring restoration effectiveness.

From a practical standpoint, it is estimated that 1-2 projects per year for the next 3 years could be completed as described above. Parcels of land are anticipated to vary in size (i.e., 20-500 acres). The Trustees are proposing to purchase land preservation agreements on properties on which restoration activities are conducted to protect restorations in perpetuity. Any proposed purchases which are implemented would be transferred from land/land preservation agreement deeds to land management groups, such as the State of Idaho, Tribal, Federal, local governments, land trusts, or conservation non-governmental organizations after following specific procedures and standards set for each entity. Property remediation, conversion and restoration would be implemented with the full agreement and cooperation of land owners. Available settlement funds, available willing landowners and costs would influence overall preservation, reestablishment, restoration and enhancement opportunities.

Table 1. Alternative B proposed interim restoration projects, estimated cost, lead trustee and specific Coeur d'Alene Basin injured resource addressed.

Project	Estimated Cost	Lead Trustee	Specific Coeur d'Alene Basin Injured Resource Addressed
Pine Creek and Tributaries	\$600,000	Bureau of Land Management	Surface water and aquatic biota habitat Fish and aquatic biota Federal lands
Moon Creek	\$25,000	US Forest Service	Surface water and aquatic biota habitat Fish and aquatic biota Federal lands
Sherlock Creek	\$200,000	US Forest Service	Surface water and aquatic biota habitat Fish and aquatic biota Federal lands
Alder Creek	\$600,000	Coeur d'Alene Tribe	Fish and aquatic biota
Benewah Creek	\$660,000	Coeur d'Alene Tribe	Fish and aquatic biota
Hepton Lake	\$300,000	Coeur d'Alene Tribe	Surface water and aquatic biota habitat Fish and aquatic biota Tundra Swans
Agricultural-to-wetland conversion and protection	\$900,000	US Fish and Wildlife Service	Tundra Swans Fish and aquatic biota

**CHAPTER 3
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CHAPTER 5
LIST OF ACRONYMS AND ABBREVIATIONS

AO	Authorized Official
ARAR	Applicable or Relevant and Appropriate Requirements
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
NEPA	National Environmental Policy Act
NRDA	National Resource Damage Assessment
NWR	National Wildlife Refuge
ROD	Record of Decision
SFCDR	South Fork of the Coeur d'Alene River
Trustees	Coeur d'Alene Basin Natural Resource Trustees
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service