Coeur d'Alene Basin Restoration Plan

(EIS Alternative 2)

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The Coeur d'Alene Basin Natural Resource Trustees

Coeur d'Alene Tribe

Idaho Department of Environmental Quality

Idaho Department of Fish and Game

U.S. Bureau of Land Management

U.S. Fish and Wildlife Service

U.S. Forest Service

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1. Introduction

For more than 100 years, the Coeur d'Alene 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 contain hazardous metals, including lead, zinc, cadmium, and arsenic. A significant portion of these wastes was discharged into the Coeur d'Alene River and tributaries. Mining-related hazardous substances released in the Basin are generally referred to throughout this document as "Mine Waste Contamination."

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 *et seq.*, provides a means for addressing releases of hazardous substances that may endanger public health and the environment. State and Tribal governments and the Federal government may take legal action against responsible parties for the cleanup and restoration of sites affected by the release of hazardous substances.

CERCLA provides for the designation of "**trustees**"—Federal, State, and Tribal authorities who represent the public's interest in restoring injured natural resources and compensating for the interim loss of services associated with those resources. The term "injury" refers to a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a release of a hazardous substance.[1] Examples of natural resources include surface and ground water, soils and sediments, riparian resources, fish, birds, benthic macroinvertebrates, and phytoplankton. Natural resource "services" are the physical and biological functions performed by the natural resource, including the human uses of those functions.[2]

Under CERCLA, trustees may seek monetary damages from responsible parties for the injury, destruction, or loss of natural resources resulting from releases of hazardous substances. These damages – which are distinct from funding for remediation (also referred to as "cleanup") – must be used by the natural resource trustees to "restore, replace, or acquire the equivalent" of the injured natural resources.[3] Damages may also include, at the discretion of the trustees, the compensable value of the natural resource services lost to the public pending the completion of restoration.[4]

The trustees for the Coeur d'Alene Basin are the U.S. Departments of Interior and Agriculture, the State of Idaho, and the Coeur d'Alene Tribe. These entities are collectively referred to as "the Trustees."

Trustees are federal, state, or tribal authorities who represent the public interest and act on their behalf regarding injured natural resources.

Through a series of lawsuits, the Trustees obtained damages from responsible parties for natural resources injured by the release of Mine Waste Contamination in the Basin. The Trustees developed this Restoration Plan for the Coeur d'Alene Basin to explain how they will use the

[1] *See* 43 CFR § 11.14(v).
[2] *See* 43 CFR § 11.14(nn).
[3] 42 U.S.C. § 9607(f)(1).
[4] *See* 43 CFR § 11.80(b).

damages recovered to restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources and the services they provide. The Trustees have formed a Trustee Council that will be responsible for implementing this Restoration Plan.

Throughout this Plan, the term "**restoration**" refers to actions undertaken to return an injured resource toward its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided. In contrast, the term "**remediation**" refers to actions taken by the United States Environmental Protection Agency (EPA) and others related to the cleanup of hazardous wastes through removal, containment, and other methods in order to protect human health and the environment.

Although restoration activities will be coordinated closely with remediation activities prescribed by EPA and others, this Restoration Plan does not otherwise address remediation.

Restoration: actions undertaken to return an injured resource toward its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided.

Remediation: the cleanup of hazardous wastes through removal, containment, and other methods in order to protect human health and the environment.

Consistent with the Natural Resource Damage Assessment and Restoration[5] regulations, the Trustees considered the following relevant factors in developing this Restoration Plan:

- technical feasibility;
- the relationship of the expected costs of the proposed actions to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources;
- cost-effectiveness;
- the results of any actual or planned response actions;
- potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources;
- the natural recovery period determined in the regulations for Natural Resource Damage Assessments and Restoration[6];
- ability of the resources to recover with or without alternative actions;
- potential effects of the action on human health and safety;
- consistency with relevant Federal, State, and Tribal policies; and
- compliance with applicable Federal, State, and Tribal laws.

[5] 43 CFR §11.82 (d).
[6] 43 CFR §11.73(a)(1).

This Restoration Plan is intended to help return injured natural resources toward baseline conditions. Baseline is not necessarily pristine or pre-development conditions but the condition that would have existed today with all of the other development and use in the Basin without the release of mining contamination.

1.1 Releases and Distribution of Hazardous Substances

For most of the 20th century, mining wastes in the Coeur d'Alene Basin were discharged into the Coeur d'Alene River and its tributaries or were deposited on land and eventually migrated into ground and surface water. Mining products and wastes containing metals were transported by train and other vehicles that spilled and tracked metals along travel routes in the Basin. Mining-related wastes were also taken from mine and mill sites or hauled out of floodplain areas for use in other applications throughout the Basin, including ballast for railroad lines, materials for 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 (Ridolfi 1998). Tailings and contaminated sediments continue to be deposited in the Coeur d'Alene River channel, levees, and floodplain, as well as in lakes and wetlands next to the River (Campbell et al. 1999; Box et al. 1996; Fousek 1996; and Rabbi 1994), and in Coeur d'Alene Lake (Woods and Beckwith 1997; Horowitz et al. 1993, 1995a, 1995). These mining-related hazardous substances released in the Basin are generally referred to throughout this document as "Mine Waste Contamination."

1.2 Damage Assessment and Injury Determination

In 1983, the EPA listed the Bunker Hill Mining and Metallurgical Complex Superfund facility on the National Priorities List in response to human health risks associated with Mine Waste 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 waterbodies, tributaries, fill areas, and the Box itself (EPA 2002, EPA 2012). The EPA defined "operable units" (OUs) for the facility. A record of decision was signed for the populated areas of Bunker Hill Box (OU 1) in 1991 (EPA 1991), and a second was signed for the unpopulated areas of the Box (OU 2) in 1992 (EPA 1992).

In 1991, the Tribe, DOI, and USDA as natural resource trustees initiated a Natural Resource Damage Assessment and Restoration (NRDAR)[7] process to assess injuries to natural resources resulting from exposure to hazardous substances, particularly lead, zinc, arsenic, and cadmium in the Coeur d'Alene Basin. The Trustees developed the assessment consistent with the U.S. Department of the Interior's damage assessment regulations.[8] The Trustees subsequently prepared and released the Phase I Injury Determination Assessment Plan (Ridolfi 1993) and the Phase II Injury Quantification and Damage Determination Assessment Plan (Stratus Consulting 2000). Results of the injury determination and quantification studies documented the following:

- Concentrations of metals in floodplain soils of Canyon Creek, Ninemile Creek, and the South Fork Coeur d'Alene River valley are phytotoxic and have caused reduced riparian vegetative cover and habitat complexity, resulting in hundreds of acres of barren and sparsely vegetated floodplain soils and sediments.

[7] 43 CFR Part 11.
[8] 43 CFR Part 11.

- Concentrations of metals in surface water (Ridolfi 1995; Ridolfi 1999) exceed chronic and acute aquatic life criteria recommended by the EPA.[9] Fish and other aquatic resources have been injured as a result of exposure to elevated metals (Ellis 1940; Stratus Consulting 2000). Populations of trout and other fish have been reduced or eliminated from the South Fork Coeur d'Alene River (Stratus Consulting 2000).
- Of the approximately 19,200 acres in the Coeur d'Alene River floodplain habitat, 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 lethal to waterfowl (EPA 2002). Ingestion of lead-contaminated sediments has resulted in waterfowl deaths and other adverse physiological effects (Beyer et al. 2000; Sileo et al. 2001).
- Approximately 40 square miles, or 85 percent, of Coeur d'Alene Lake lakebed sediments contain lead concentrations above values considered ecologically harmful.

In 1998, as the Trustees' damage assessment studies were near completion, the EPA initiated a CERCLA remedial investigation and feasibility study of human and ecological risks from exposure to Mine Waste Contamination outside the Box. Identifying this area as OU 3, EPA's findings and conclusions were consistent with the Trustees' findings and conclusions concerning the extent and impact of Mine Waste Contamination on natural resources in the Coeur d'Alene Basin. In 2002, the EPA issued an interim record of decision for OU 3, specifying 30 years of cleanup actions in areas upstream and downstream of Coeur d'Alene Lake at an estimated cost of $359 million. The EPA did not select cleanup actions for Coeur d'Alene Lake. Instead, it deferred to the Tribe and the State of Idaho ("the State") to develop and implement an updated lake management plan to monitor and address metals-contaminated sediments in the lake (EPA 2002; Ridolfi and Falter 2004). Subsequently, the Tribe and State adopted the Coeur d'Alene Lake Management Plan in 2009 (IDEQ and Coeur d'Alene Tribe 2009).

A number of agencies are implementing cleanup of Mine Waste Contamination in the Coeur d'Alene Basin. They include the Idaho Department of Environmental Quality, U.S. Forest Service, Bureau of Land Management, and the EPA. The strategy for cleanup in the Basin focuses on source control and removal, particularly of lead in soil and sediment, as well as dissolved zinc, cadmium, and particulate lead in surface waters. Source control techniques include treating surface water and groundwater to remove excess zinc, arsenic, cadmium, lead, manganese and mercury; excavating and removing contaminated soils; permanent capping of contaminated areas; and other techniques to reduce metal concentrations.

1.3 Litigation and Settlements

In 1983, the State initiated a civil action under CERCLA against several mining companies for response costs and natural resource injuries in the Coeur d'Alene Basin. The State settled with those companies in 1986. The Tribe filed a lawsuit in 1991 and the U.S. Government filed one in 1996. These were later consolidated. The trial on liability issues began in January 2001 and continued through July 2001.

In 2003, the U.S. District Court for the District of Idaho ruled that the Tribe and Federal Trustees established that two non-settling mining companies, ASARCO Incorporated and Hecla Mining Corporation, Inc., were liable under CERCLA and the Clean Water Act for natural resource

[9] 63 FR 68354.

injuries resulting from releases of Mine Waste Contamination into the Coeur d'Alene Basin. Numerous natural resource injuries were demonstrated in the damage assessment and confirmed by the U.S. District Court in 2003.[10] Also during this period, pursuant to CERCLA section 122(g), several *de minimis* settlements were entered with other contributing parties. The named defendants settled with the Trustees, either separately or together, resulting in more than $140 million received by the Trustees from 1986 to 2011 for restoration activities. Table 1 summarizes the various NRDAR settlements covered by this Restoration Plan:

Table 1. NRDAR settlements covered by this Restoration Plan

Year	Settling Entity
1995	Gulf U.S.A. Corporation and Pintlar Corporation
2000	Union Pacific Railroad
2001	Sunshine Mining and Refining Company, *et al*
2001	Coeur Mining and Callahan Mining Corporation
2003	ASARCO LLC
2010	Grupo Mexico/ASARCO LLC
2010-2011	Various *de minimis* mining companies
2010	Atlantic Richfield Co.
2011	Hecla Mining Company, Hecla Ltd., *et al*

1.4 Formation of the Restoration Partnership

Based on joint Trusteeship over injured natural resources as well as the joint settlements, a memorandum of agreement (MOA) was signed in 2012 by the Tribe, the U.S. Department of the Interior, the U.S. Department of Agriculture, and the State. The MOA addresses the planning and implementation of restoration of natural resources or natural resource services that were injured, destroyed, or lost as a result of the release of Mine Waste Contamination into the Coeur d'Alene Basin. The agreement establishes a process for coordinating and cooperating on the development and adoption of this Plan, implementing the Plan to accomplish restoration, and expending settlement funds.

The Trustees entered into the MOA to continue their respective responsibilities and authorities as natural resource trustees in compliance with CERCLA and other applicable laws and regulations.[11] The Trustees and their representative agencies are the:

- Coeur d'Alene Tribe;
- U.S. Department of Agriculture (Forest Service);
- U.S. Department of the Interior (Fish and Wildlife Service and Bureau of Land Management); and
- State of Idaho (Idaho Department of Fish and Game and Department of Environmental Quality).

[10] *Coeur d'Alene Tribe v. Asarco Inc., et al.*, 280 F. Supp. 2d 1094 (D. Idaho 2003).
[11] Sections 107 and 111 of CERCLA, 42 U.S.C. § 9651(c); 43 CFR Part 11; and Section 311(f) of the Clean Water Act, 33 U.S.C. 1321(f).

The Trustee Council is the decision-making body for implementation of the Plan, and it meets regularly to:

- collaborate with one another regarding natural resource restoration in the Coeur d'Alene Basin;
- collaborate with the public regarding natural resource restoration; and
- ensure the restoration process complies with all applicable laws and regulations.

The Trustee Council and supporting agencies working towards Coeur d'Alene Basin natural resource restoration are referred to as the "Restoration Partnership." It is the intent of the Partnership to work collaboratively and inclusively with stakeholders to effectively implement restoration.

Mission Statement

The Trustees will develop and implement a restoration plan to help restore the health, productivity, and diversity of injured natural resources and the services they provide in the Coeur d'Alene Basin for present and future generations.

Vision Statement

The Trustees envision a Coeur d'Alene Basin where natural processes sustain clean, healthy, and diverse habitats that support fish and wildlife populations, and the human cultural, recreational, and economic benefits that derive from them.

1.5 Purpose of the Plan

The purpose of and need for the Restoration Plan is to create a principled framework for choosing projects to restore, replace, and/or acquire the equivalent of the natural resources that were injured by releases of mining-related hazardous substances in the Coeur d'Alene Basin ("Mine Waste Contamination") and to compensate for the interim loss of human uses previously provided by those injured natural resources.

Figure 1 outlines the flow of the Restoration Plan.

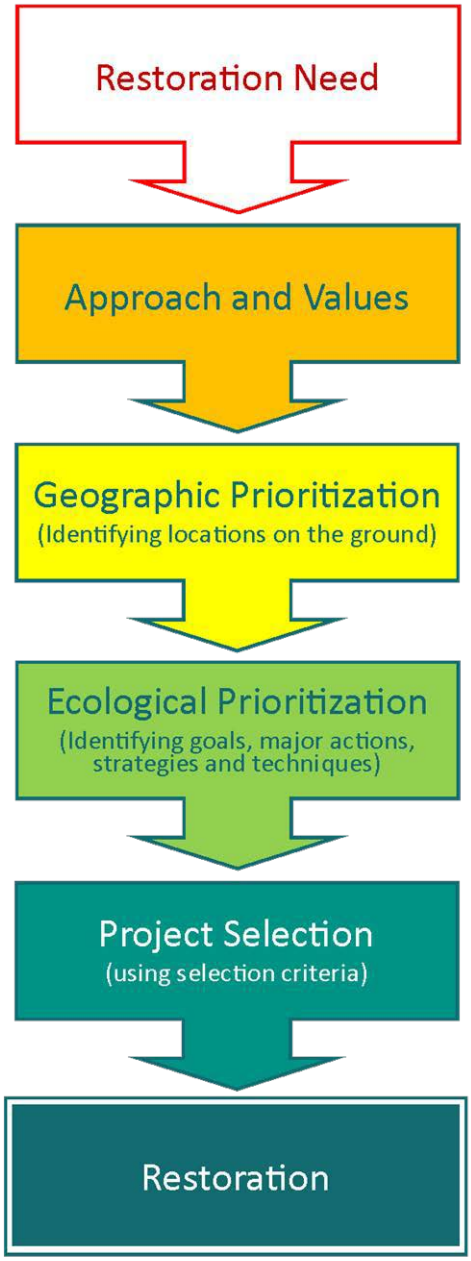

Figure 1. Schematic describing flow of the Restoration Plan

2. Restoration Approach and Values

When conducting restoration, the Trustees will be guided by the following values.

2.1 Link to Injured Resources

Under CERCLA, the Trustees act on behalf of the public to recover damages for particular injured natural resources. The NRDAR regulations that guide the Trustees' restoration process explain that the measure of damages is either the cost of (1) restoring or rehabilitating the injured natural resources to a condition where they can provide the level of services available at baseline, or (2) replacing and/or acquiring equivalent natural resources capable of providing such

services. Damages can also include the compensable value of the natural resource services lost to the public pending restoration, including lost human uses of the injured natural resources.[12]

The Trustees are required to use recovered funds to "restore, replace, or acquire the equivalent of such natural resources" for which the damages were recovered.[13] As explained further in Section 5.4, the Trustees have identified this link to the injured resources and the services they provided as necessary for identifying future restoration projects.

2.2 Coeur d'Alene Basin Focus

The Trustees anticipate that restoration needs will exceed available financial resources from settlement funds. Restoration in the Coeur d'Alene Basin will improve natural resources, compensate for services previously provided by those injured natural resources, and provide direct benefits for the public affected by those injuries. Therefore, the Coeur d'Alene Basin will be the primary focus of restoration under this Plan. For the purposes of this Plan, the "Basin" refers to the Coeur d'Alene Lake watershed and Upper Spokane River Subbasin in Idaho. The Trustees will consider projects outside of the Basin only when they occur in the portion of the Hangman Creek watershed located within the exterior boundary of the Coeur d'Alene Reservation in close proximity to tribal population centers, and compensate for natural resource services lost to the Coeur d'Alene Tribe in the Basin as a result of Mine Waste Contamination. As used in this Plan, the term "Hangman Creek Watershed" refers to the area that drains into the mainstem of Hangman Creek and its tributaries located within the exterior boundary of the Coeur d'Alene Reservation. Thus, the Planning Area will encompass both the Coeur d'Alene Basin and the portion of the Reservation as identified above (see Figure 2).

2.3 Restoration in Contaminated Areas

The Trustees expects that restoration will occur where injuries took place. However, some sites impacted by mining may be so costly to remediate and restore, or the return on investment so low, that working there is unjustifiable. Similarly, some uncontaminated areas in the Basin may present restoration opportunities with low cost, high returns on investment, or special opportunities not available in mining-impacted areas. Thus, although restoration focuses on mining-impacted areas, this does not exclude work in other areas.

2.4 Emphasis on Ecosystem Processes

The Trustees will focus restoration on the biotic and abiotic processes that form and maintain functioning ecosystems that, in turn, provide habitat for wetland, aquatic, and riparian species. Desired habitats are self-sustaining and resilient to disturbance (such as changing climate). Ecosystems comprise a biological community of interacting organisms and their physical environment. Because ecosystems integrate biotic and abiotic environmental elements and how they relate to one another, they provide the best frame of reference from which to engage in restoration.

[12] See 43 CFR § 11.80(b)
[13] 42 U.S.C. § 9607(f)(1)

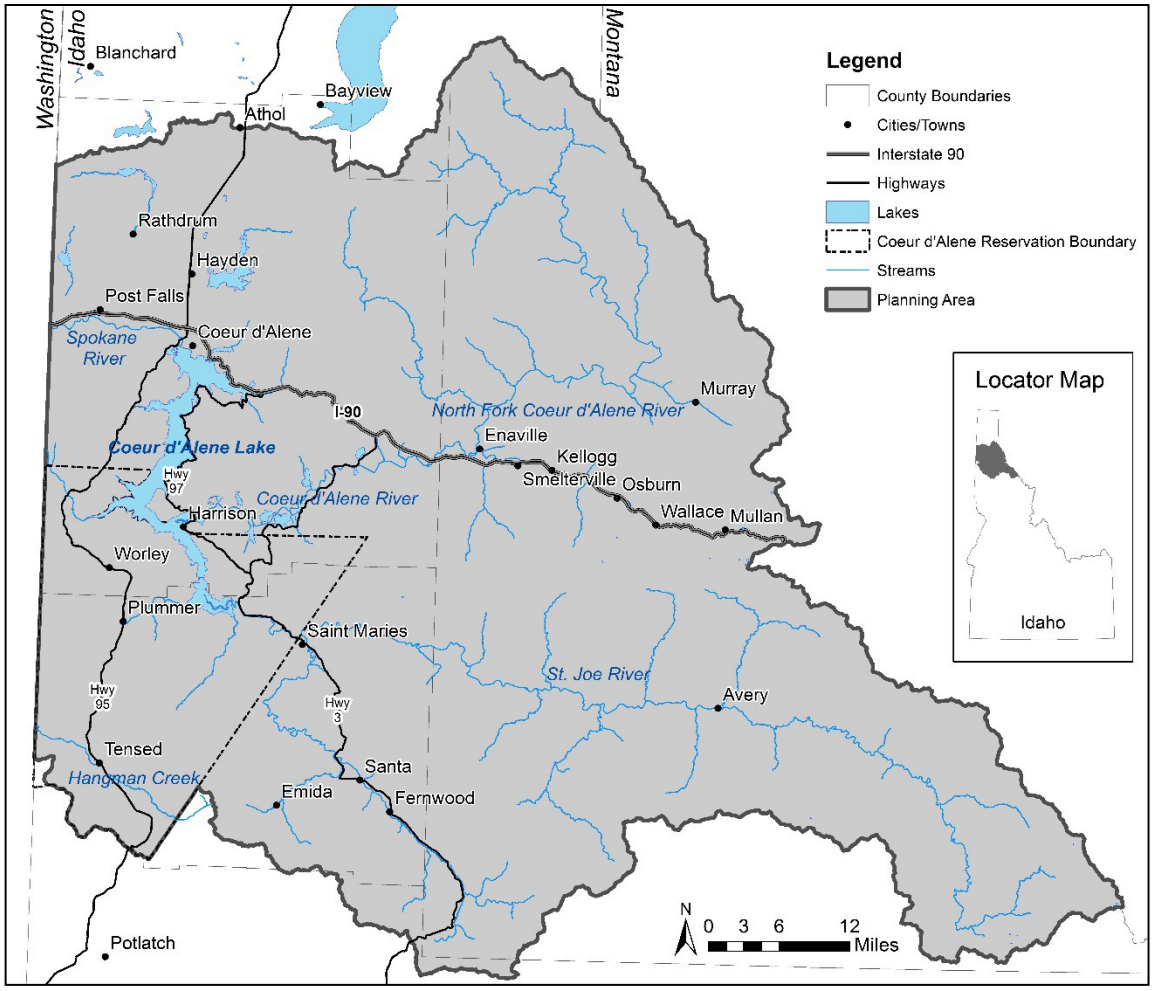

Figure 2. The Planning Area

2.5 Habitat Focus and Focal Resources

The Trustees recognize and value the complementary nature of habitat and target species approaches to ecosystem restoration. Although restoration implementation described below is primarily habitat focused (because it is the ecosystem element we can most directly and sustainably affect), restoration will in part be guided by conservation needs of key focal species or resources. Focal species were chosen so that restoration based on them will enhance several other natural resources as well.

2.6 Best Available Science

The Trustees will be guided by the best scientific information available when planning and conducting restoration. As new science and data become available, they will help to further refine and inform restoration efforts.

2.7 Cultural Focus

The Trustees value the Tribal and non-Tribal cultural significance of natural resources throughout the Basin, and will strive to restore them in a way that provides for traditional uses, subsistence practices, natural-resource-based recreation, and other services. By incorporating

cultural values, restoration will contribute to the ecological and socio-economic well-being of the Basin for current and future generations.

2.8 Engagement with Stakeholders

The Trustees' partnerships with local governments, businesses, community groups, and private landowners will play a vital role during restoration. Public participation and values will be considered, and restoration will be implemented in a transparent manner. The Trustees will encourage long-term community stewardship of natural resources through education, partnerships, and public involvement.

2.9 Economic Resilience

The Trustees value restoring injured natural resources in a way that sustains regional cultures and economies and contributes to the health of the Basin as an ecological and socio-economic region. Healthy, functioning ecosystems support local economies by increasing availability of clean soil and water, providing jobs to conduct restoration work, increasing tourism, improving community aesthetics, and providing increased recreational opportunities.

2.10 Human Uses of Natural Resources

This Restoration Plan integrates ecological restoration of injured wetland, stream, and lake ecosystems with funding for "Human Use Projects," which are intended to provide some compensation for interim natural resource service losses due to the injury, specifically lost human uses of natural resource services, including natural-resource-based uses unique to the Coeur d'Alene Tribe.

Human uses are the tangible and intangible benefits people derive from natural resources such as hunting, fishing, subsistence, and scenery.[14] These uses are dependent on natural resources such as functioning watersheds, healthy fish and wildlife populations, and intact habitat. These natural resources were injured or lost by the release of Mine Waste Contamination.

Where consistent with the Plan, the Trustees value compensating for services lost to the public because of injury to natural resources quickly. In particular, the Trustees will seek opportunities to enhance cultural and recreational uses (such as hunting, fishing, and trapping), and environmental education closely related to injured natural resources in the Planning Area where such activities do not increase human health risks or conflict with cleanup and ecological restoration goals. As explained in greater detail in Section 4.4, the Trustees may allocate up to a total of 10 percent of available restoration funds to Human Use Projects: up to 5 percent for projects associated with other ecological restoration projects in the Basin, and up to 5 percent for projects directly focused on providing near-term compensation for the natural resource services lost to the public. This second 5 percent portion of Human Use Projects need not be tied to primary natural resource restoration projects and could be implemented in either the Basin or in the Hangman Creek Watershed.

[14] 43 CFR 11.14(nn) defines "services" as "the physical and biological functions performed by the resource including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource."

Examples of Human Use Projects could include, but are not limited to:

- habitat restoration work (when priorities are based on Coeur d'Alene Tribal cultural services that have been injured),
- an educational placard describing restoration of an injured wetland and resulting bird habitat,
- a boat ramp,
- a wildlife observation blind,
- enhancing the scenery of areas that have ecological value and support local tourism, or
- improving trail access and educational kiosks that interpret natural resources and support wildlife viewing.

Where possible, Human Use Projects will be designed to permit public access to restored natural resources so people can enjoy the results of restoration work.

2.11 Integration

Where appropriate and where value can be added, restoration will be integrated with relevant aspects of other management plans throughout the Basin such as county comprehensive plans, the Idaho Panhandle National Forests Land Management Plan, the Bureau of Land Management's Coeur d'Alene Resource Management Plan, Idaho Fish and Game management plans, the Coeur d'Alene Tribe's Integrated Resource Management Plan, and other plans relevant to restoration of injured natural resources. In particular, restoration will be coordinated with ongoing cleanup under the EPA records of decision, the Coeur d'Alene Lake Management Plan, and cleanup at smaller Mine Waste Contamination sites within the Basin.

2.12 Cost-Effectiveness

Settlement funds for restoration are finite, and restoration needs exceed available funds. The Trustees will seek partnerships for cost-share opportunities to augment, match, or leverage settlement funds. The Trustees desire maximizing funds for on-the-ground restoration while keeping administrative and project operation and maintenance costs as low as possible.

2.13 Timing and Rate of Restoration

The Trustees prefer to initiate and conduct restoration work as soon as possible to restore injured natural resources and provide public benefits. However, the rate of restoration will be influenced by the availability of projects that meet the goals of this Plan, capacity to complete projects, feasibility of working in priority areas, and status of cleanup. These factors may require the Trustees to slow the rate of restoration at times to allow independent actions to proceed, such as the EPA remediation of the Lower Basin.

2.14 Monitoring and Adaptive Restoration

Monitoring is important to evaluate whether the objectives of restoration were met. Results of monitoring will be used to inform restoration efforts as well as to modify existing projects to improve results.

2.15 Preferred Approaches

A variety of approaches to restore injured natural resources and compensate for interim service losses are available, and it is important to retain a wide range of options. The Trustees will retain flexibility to use any legal means to accomplish restoration goals. Although any particular approach may be the right tool in a particular context or setting, not all approaches are equally desirable. The Trustees intend to place more effort and funding on higher priority approaches and anticipate some approaches may not be employed at all.

In descending order of preference, and as adjusted by the selection criteria, the Trustees will consider the following categories of projects:

1. Restoration at locations within the Basin where injury occurred and the restored natural resources or services are of the same physical, biological or cultural nature of those injured or lost.
2. Restoration at locations within the Basin where injury did not occur but the restored natural resources or services are of the same physical, biological or cultural nature of those injured or lost.
3. Restoration at locations within the Basin where injury occurred but the restored natural resources or services are of a different physical, biological, or cultural nature of those injured or lost (for example, replacing fishing opportunities by constructing a fishing pond).
4. Acquisition of equivalent resources within the Basin where land with natural resources of the same physical, biological or cultural nature of those injured or lost is purchased and placed into public ownership, management, and protection. Acquisition may be considered more desirable when it facilitates or augments Trustees efforts at achieving higher restoration priorities and is not an end in itself.
5. Near-term Human Use Projects in the Basin, and outside of the Basin only when they occur in the Hangman Creek Watershed in close proximity to tribal population centers, and compensate for natural resource services lost to the Coeur d'Alene Tribe in the Basin as a result of Mine Waste Contamination.

2.16 Types of Restoration Not Desired

Restoration projects considered under this Plan must benefit natural resources injured by mine waste releases. Projects that will not be considered include, but are not limited to:

- projects that impede ecological restoration or cleanup;
- projects that do not address injured resources or the services they provide;
- projects that address economic, infrastructure, or recreational concerns unrelated to injured natural resources; and
- projects that increase human health risks in contaminated environments.

3. Geographic Prioritization of Ecosystem Restoration

As noted previously, the Trustees recognize that the entire suite of injured resources cannot be restored with existing settlement funds. Therefore, the Trustees have selected wetland, stream, and lake ecosystems as the focus for restoration (Figure 3). These ecosystems provide the best

frame of reference to engage in restoration of each of the injured resources because they integrate both biotic and abiotic environmental elements and because of the way they relate to one another. In the Basin, wetland, stream, and lake ecosystems have sustained substantial environmental injury. In their baseline condition, these ecosystems are highly productive, typically have high species diversity, and the presence of water attracts wildlife and concentrates human use. The Trustees choose to direct their limited resources to wetland, stream, and lake ecosystems because of their history of injury and their importance to people and wildlife.

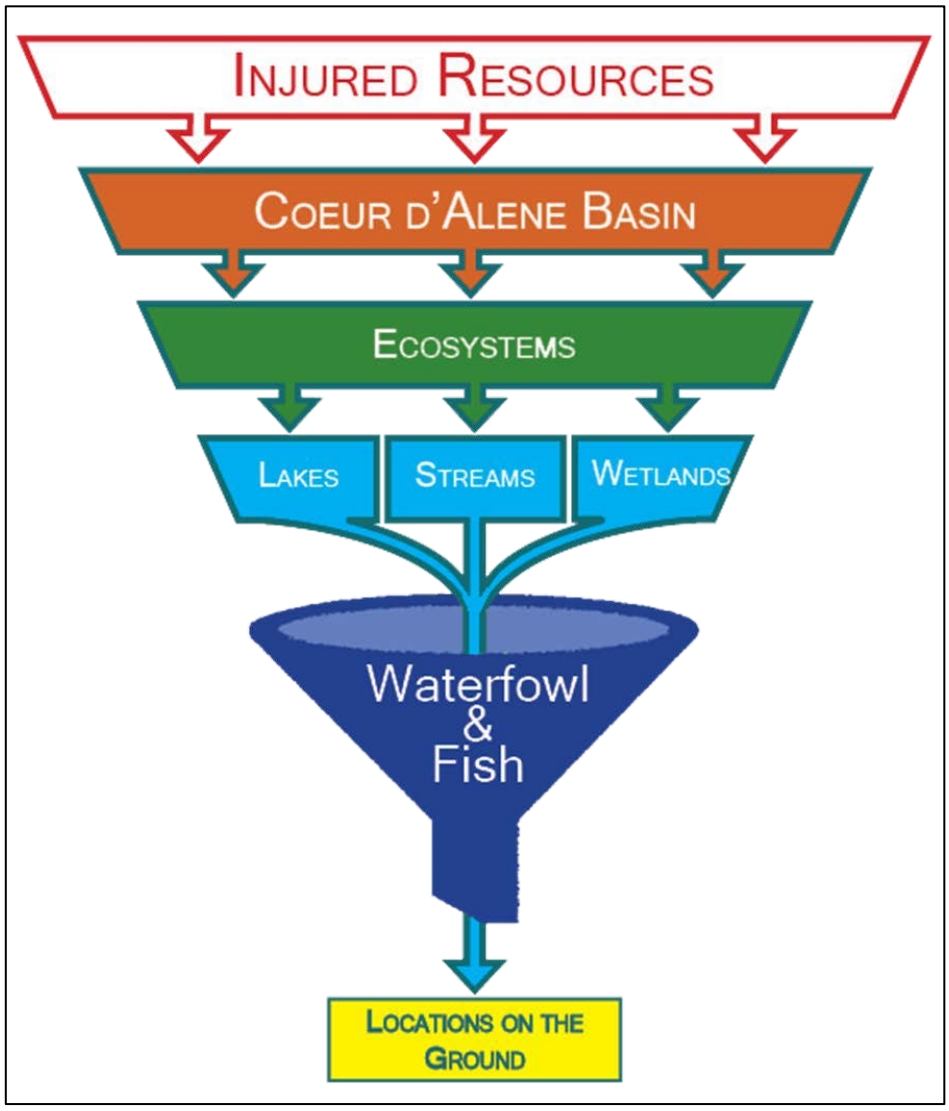

Figure 3. Geographic prioritization of restoration projects

The number of potential restoration opportunities in wetlands, lakes, and streams still exceeds available funds. Consequently, the Trustees identified a subset of resources—fish and waterfowl—to guide ecosystem restoration and facilitate geographic prioritization. Doing so will:

- **Ensure restoration integrates a full suite of ecosystem processes and functions.** Fish and waterfowl require intact, functioning ecosystems, including complexes of wetlands, streams, lakes, and riparian areas. They also require specific habitat features relative to other injured resources. Therefore, functioning streams, wetlands, and lakes are required to provide habitat for these and other injured natural resources.
- **Benefit many other injured resources in the Basin.** The ecosystems fish and waterfowl rely upon—streams, wetlands, and lakes—support other injured natural resources as well. For example, restoring a stream in an important area for fish will also improve soils and sediments, benthic macroinvertebrates, and riparian corridors used by songbirds and other wildlife.

3.1 Waterfowl

When evaluating where to do restoration in the Basin, waterfowl were chosen as a focal resource for several reasons:

- Waterfowl and the services they provide were injured by the release of Mine Waste Contamination.
- Restoration that benefits waterfowl will benefit other injured natural resources. Waterfowl require high-quality wetlands and all of their inherent functions and services. Providing habitat for waterfowl will provide for many other bird and wildlife species that inhabit wetlands as well, including amphibians, and mammals. Also, injured resources, such as soils and sediments, water quality, and recreational and cultural opportunities, will be improved in conjunction with wetland restoration.
- Restoration of wetlands includes riparian margins, which benefit other injured resources, such as songbirds, fish, mammals, and amphibians.
- Waterfowl are highly visible and have strong cultural and recreational links. From bird watching to hunting, the public has enjoyed waterfowl in the Basin for centuries.

There are already extensive waterfowl data available for the Basin. To gauge success of restoration, data collected before restoration are essential. A migratory waterfowl monitoring program in the Basin has been in place for the past 10 years and will be an important source of data to inform and evaluate restoration.

3.2 Fisheries

To establish geographic priorities for aquatic restoration in the Basin, benefits to native fish communities, particularly bull trout and westslope cutthroat trout, will be a primary guide. Fish were chosen as focal resources for the following reasons:

- Fish, and the services they provide, were injured by the release of Mine Waste Contamination.
- Restoration that benefits fish is expected to benefit a wide range of aquatic resources. Westslope cutthroat and bull trout are highly sensitive to water quality and require high quality, functional aquatic habitats including lakes, streams, and floodplains. Restoration

actions for sensitive native trout will benefit many other fish and aquatic species as well as wildlife, lost human uses, and other injured resources.

- Stream restoration includes watershed and riparian restoration, which benefit other injured resources including songbirds, waterfowl, mammals, and amphibians.
- Fish provide a direct link to services and potential economic opportunities.
- Fisheries monitoring is already conducted throughout the Basin, and substantial information is available to guide restoration.

4. Proposed Goals and Major Actions

This section describes the goals and major actions for wetlands, streams, lakes, and Human Use Projects. In general, the Trustees are relying on focal resources (waterfowl and fish) to prioritize restoration geographically, and on-the-ground work will primarily involve physically manipulating habitats, rather than the fish and wildlife that depend on them. Focal resources will simply guide where and how that work is done. The Trustees' approach will be to restore function and process to habitats and services so they can support the focal resources. The primary focus of restoration will be on wetlands, streams, lakes, and associated riparian habitats. Where deemed appropriate by the Trustee Council, however, consideration will be given to funding fish and/or wildlife population management actions designed to provide long-term and lasting benefits to species identified as focal for restorations.

Riparian habitat is a key component of wetlands, lakes, and streams and occurs as a transitional area between aquatic and upland ecosystems; it includes all land directly affected by surface water (Verry et al. 2000). Riparian habitats influence aquatic systems by controlling erosion and sedimentation, moderating water temperature, providing woody debris structure, and maintaining invertebrate communities that contribute to food chains in aquatic systems. In addition to these contributions, riparian areas provide habitat to a broad array of terrestrial reptiles, amphibians, birds, and mammals. Restoring riparian habitats will benefit those populations and enhance the many functions and services that riparian areas provide. Riparian restoration projects will be guided by, and incorporated with, wetland, lake, and stream restoration projects, and descriptions of riparian restoration are incorporated into those sections. Although the physical, biological, and cultural elements of wetlands, lakes, and streams in the Basin landscape are strongly interconnected (for example, riparian areas contribute wood structure to streams, which flow into wetlands), they are considered separately in this section because different strategies and techniques are used for each.

4.1 Wetlands

Wetlands are complex systems that provide many services to society and natural resources. In the Basin, they are characterized by shallow water and a variety of emergent and submergent plants and woody vegetation. Most wetland habitat in the Basin occurs along the Coeur d'Alene River floodplain in an area known as the Lateral Lakes. Because of contamination in the Basin and varying levels of wetland degradation, there is a variety of settings in which wetland restoration can occur, each requiring a different restoration approach.

The Trustees will implement a strategy to improve current ecological conditions and make progress toward reaching desired future conditions for injured wetland and riparian ecosystems within the Basin. The desired conditions include:

- shallow water, which is able to support emergent and submergent wetland vegetation that provides cover and food for wetland wildlife;
- sufficient clean feeding habitat and a significant decrease in lead exposure and mortality of wetland wildlife;
- diverse native vegetation in wetland and riparian habitats;
- a mixture of open water and vegetation that support optimal nesting and feeding conditions;
- a variable hydroperiod with seasonal fluctuations which is necessary for optimum wetland productivity; and
- a complexity of wetlands with a diversity of conditions that collectively consist of individual wetlands, which vary in duration and frequency of flooding and vegetation communities.

In general, properly functioning, natural wetlands should exhibit these characteristics with little need for maintenance. However, due to widespread contamination and extensive changes to wetland habitats over the past century, wetlands restoration in the Basin is likely to require long-term maintenance to achieve desired conditions. Maintenance and management in the form of water level management, invasive species control, and ditch and berm construction, will assist in reducing recontamination risk and maintaining the value of restored wetlands into the future.

Wetlands Goal: Restore injured wetland processes, functions, species, habitats, and services

Major Actions

- Restore wetland process and function, including plant diversity and hydrology, to uncontaminated but degraded wetlands.
- Construct new wetlands on low gradient uncontaminated sites with adequate water supply and low potential for contamination.
- Restore wetland process, function, and diversity in conjunction with cleanup at contaminated wetlands that have low or controllable risk for recontamination.
- Decrease waterfowl and wildlife exposure to harmful levels of Mine Waste Contamination where cleanup is cost prohibitive and recontamination risk is high or difficult to control.
- Protect and preserve healthy functioning wetlands.

4.1.1 Major Actions for Wetland Restoration

Restore wetland processes and function, including plant diversity and hydrology, to uncontaminated but degraded wetlands.

The Trustees have identified opportunities in uncontaminated wetlands. Uncontaminated wetlands, especially where they would be valuable to waterfowl, are limited in the Basin. However, where uncontaminated wetlands are found in a degraded state, restoration can be cost-effective relative to restoring contaminated wetlands. If they have not been contaminated over

the past 100 years, recontamination is not likely to be an issue. Usually, wetlands in this category have been drained or modified for any number of human uses, or invasive vegetation has displaced native species. The majority of these opportunities will be outside of the floodplain. Strategies for these projects will be to restore natural hydrology and vegetation to a state preferred by wetland wildlife.

Construct new wetlands on low-gradient, uncontaminated sites with adequate water supply and low potential for contamination.

These opportunities are in similar areas to uncontaminated wetlands; however, they occur where wetlands have not historically occurred. They represent opportunities to expand total wetland acres in the Basin and help offset or replace losses of wetlands where restoration is difficult or impossible because of contamination loads and a high risk for recontamination. If site conditions are favorable, it is possible to construct new wetlands where they have not existed. Because they did not occur naturally, it is difficult to create all of the functions of a native wetland, but some habitat quality can be created. Creating wetlands may involve a significant amount of excavation, by either building low-level berms to back up water or excavating shallow water areas to pool water. If this is done in low-gradient sites that have enough water input, hydric conditions can be created that will help wetland plants establish and provide habitat for wetland wildlife.

Restore wetland processes, function, and diversity in conjunction with cleanup at contaminated wetland sites that have low or controllable risk for recontamination.

Contaminated wetlands with low or controllable risk of recontamination are a high priority for restoration because they represent continuing injuries to waterfowl, as well as opportunities that most directly compensate for injury to wetlands from the release of Mine Waste Contamination. It is also perhaps the most difficult major action because, where wetlands are contaminated, the potential for recontamination is high. Restoring and maintaining wetlands in the contaminated zone along the Coeur d'Alene River will likely require the most intensive techniques to control water flow and prevent recontamination.

Priorities for cleanup are unknown and will become clear as more data are available to help make decisions. In the Coeur d'Alene River floodplain, it is particularly important to coordinate cleanup and restoration.

Decrease waterfowl and wildlife exposure to harmful levels of Mine Waste Contamination where cleanup is cost prohibitive and recontamination risk is high or difficult to control.

Because of recontamination potential, restoration may not be feasible in all contaminated wetlands. However, the Trustees still hope to reduce injury to waterfowl and other wildlife in these wetlands. Possibilities to reduce exposure are to manage water levels at strategic times to make them undesirable to waterfowl or to make vegetation and sediments inaccessible to feeding waterfowl. Tundra swans, one of the focal species in the Trustees' assessment and determination of injuries due to Mine Waste Contamination (Stratus 2000), feed by burrowing their bills into sediment just below the water line where they feed on aquatic vegetation and roots. Sediments containing Mine Waste Contamination coat this vegetation, which is then ingested by the swans (Sileo et al. 2001). If water is too deep to reach sediments or if wetlands are de-watered, exposure to contaminants will be reduced in the short term.

Another possibility is managing vegetation to make habitat undesirable. When these projects are conducted, practices will be used that can easily be reversed if conditions improve and

contamination is no longer an issue. For example, if a wetland is managed with a water control structure to raise water levels during waterfowl migration, the same structure either can be removed or can provide optimal water levels once contamination is at a tolerable level.

Protect and preserve healthy functioning wetlands.

Wetlands that fit this category are rare. If high-functioning wetlands exist without contamination, they are likely protected by land ownership or some other mechanism. In the rare case that there is a wetland in need of protection, that will be a high priority. Protection in some form will also be essential after restoration projects are complete to protect time and funding investments made by the Trustees. Protection can occur by land acquisition, conservation easements, or other means.

4.1.2 Priority Areas

The Trustees will focus wetland and riparian restoration in strategic locations that can support habitat characteristics beneficial to waterfowl and other wetland species. The highest priority for restoration will be areas where waterfowl are abundant and where sediment and water quality are impaired. In the Planning Area, these are the wetlands and lakes along the Coeur d'Alene River. Wetland restoration outside of the wetlands and lakes along the Coeur d'Alene River will also be considered if they are in the Planning Area and if there is a high likelihood that waterfowl and other injured wetland wildlife can be restored as a result of the restoration.

The timing and location of priorities will also in part be determined by opportunities to coordinate with cleanup and to enhance habitats following cleanup. According to the EPA 2002 record of decision, priorities for cleanup in the Coeur d'Alene River floodplain are Harrison Slough, Killarney Lake, Canyon Marsh, Lane Marsh, Medicine Lake, Cave Lake, Bare Marsh, Anderson Lake, Thompson Lake, and Thompson Marsh. Another priority for cleanup is the conversion of agricultural land to wetlands. As more information becomes available regarding sediment movement, those priorities may be refined, and efforts are ongoing between the Trustees, EPA, and others to ensure that cleanup and restoration are coordinated where possible. Several sources were used to identify waterfowl priority areas:

- National Wetlands Inventory, Idaho GAP Analysis, and other wetland data to identify habitat types and drained wetlands;
- lead contamination data to determine what areas are above and below the 530 parts per million threshold for waterfowl, identified by EPA, and the extent of contamination in waterfowl feeding areas;
- waterfowl abundance and use data from U.S. Fish and Wildlife Service to show where waterfowl are concentrated during spring migration; and
- coordination with EPA and others to determine where cleanup is likely to occur and to ensure that restoration will be technically feasible.

Priority areas were divided into three groups based on waterfowl use, contamination of wetlands, and where restoration is feasible. The Trustees will only consider wetland projects that fall into one of the following tiers. Final project selection will be based on these tiers as well as the other criteria identified in Section 5.4.

Tier 1 priorities are those wetlands that are the highest priority for restoration (Figure 4). Some wetlands and waterbodies in the Coeur d'Alene River floodplain that are next to each other and can be connected by surface flow can be considered wetland complexes. Tier 1 wetland

complexes are those that receive high waterfowl use and are contaminated above the threshold that causes injury to waterfowl (Table 2).

Table 2. Tier 1 wetlands and wetlands complex priority areas waterfowl observations, and additional restoration considerations

Wetland	Acres	Average waterfowl observations* per year (% of total survey)	Other Considerations
Lane Marsh, Strobl Marsh, Killarney Lake Complex	1,300	21,400 (22%)	High swan and other waterfowl use, high exposure to contamination, near existing restoration projects, potential to manage water levels.
Canyon Marsh	870	16,600 (17%)	High waterfowl use with ample restoration potential. Canyon Marsh is mostly private land, so this restoration priority is entirely dependent upon landowners being willing to participate. Any project done on private property is entirely voluntary on the part of the landowner.
Thompson Lake, Thompson Marsh, Harrison Slough, Anderson Lake Complex	2,800	16,600 (17%)	High waterfowl use, high exposure to contamination, ability to manage water levels, clean water source, high contamination, accessible
Cave Lake, Medicine Lake Complex	1,750	13,000 (13%)	High waterfowl use, clean water sources, accessible

* Waterfowl observations are averaged from surveys conducted by USFWS from 2005 to 2014 during spring migration (February-April).

Strategies for restoration in Tier 1 areas will depend on the site. For those sites that have a reasonable expectation of minimal recontamination, remediation and restoration can be done. For those sites in which recontamination cannot be controlled, steps can be taken to reduce exposure to wildlife, including water level and vegetation management. Most Tier 1 wetlands will fall under the major actions dealing with restoration following remediation or reducing exposure to waterfowl when exposure is high and recontamination cannot be controlled.

Properties next to these wetland complexes will be considered part of the complex. Projects done in Tier 1 wetlands should reduce exposure or reduce contamination and restore habitat.

Tier 2 priorities are all other wetlands along the Coeur d'Alene River, Lower St. Joe River, the bays and backwaters of Coeur d'Alene Lake, and any wetlands along the lower North and South Fork Coeur d'Alene River corridors and Lower St. Maries River. These areas are either directly affected by mine waste releases or contain valuable wetland resources near the affected wetlands. Projects involving Tier 2 wetlands could fall under any of the major actions outlined above. It is expected that many projects will occur in Tier 2.

Tier 3 priorities are any other wetlands in the Basin, which are primarily uncontaminated. There are likely wetland restoration opportunities outside of the priority areas described above, and those areas will be considered if there is a reasonable expectation that wetland processes and functions important to injured resources can be restored. These will likely be smaller projects.

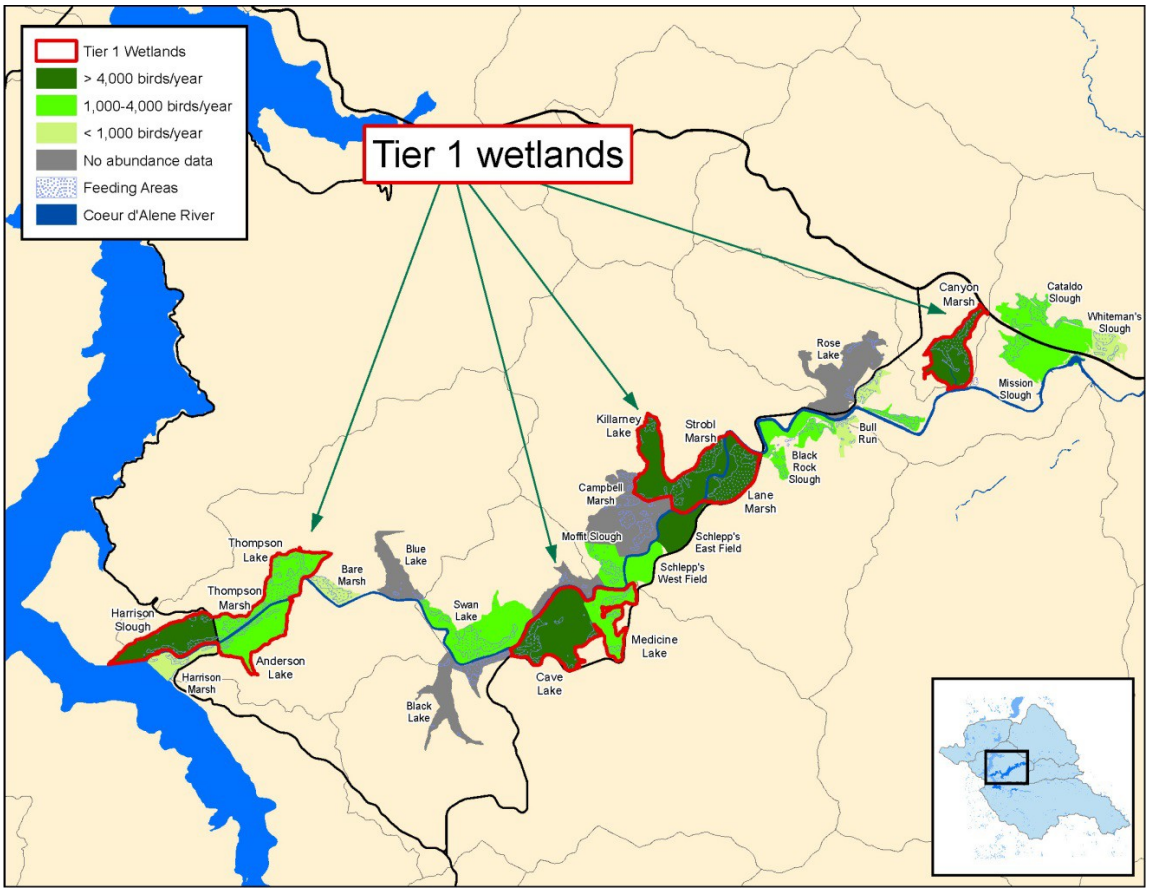

Figure 4. Tier 1 wetlands and complexes (outlined in red)

4.1.3 Strategies and Techniques

Many strategies and techniques are available to restore wetlands in priority areas. Each strategy listed in Table 3 can be accomplished with a number of on-the-ground techniques. The techniques used will depend on a variety of factors, including topography, existing hydrology, vegetation composition, proximity to other wetlands, engineering feasibility, and ability to manage water.

Which techniques are used in specific locations will be determined on a project-by-project basis.

See Table 3 for an overview of wetland restoration strategies and techniques that support the ecosystem processes focus of this Restoration Plan. The following list is not intended to be comprehensive or exhaustive; rather it identifies broad approaches and common themes that will be promoted and practiced throughout wetland restoration activities implemented under this Plan.

Strategies define the general types of restoration project that may occur.

Techniques describe practices on the ground that will be employed to accomplish various strategies.

Table 3. Strategies and techniques for wetland restoration

Strategy	Background	Technique
Restore hydrology	To restore wetlands that have been modified by land use changes, restoring hydrology (timing, depth, and duration of saturation) is essential. Hydrology will be different depending on the wetland type and location, but should include shallow water areas and fluctuating water depths. Hydrology will be encouraged that provides habitat for as many species as possible.	Diking Water control structure Pump water Shallow water excavation Plug ditches Remove drain tiles
Water level manipulation	Many restoration projects will require the ability to manage water levels. Water level control is also an important management tool for controlling undesirable vegetation and encouraging desirable species.	Diking Water control structure Pump water Shallow water excavation Plug ditches
Moist soil management	A common management scheme that employs dikes and water control structures to manipulate water levels that are optimal for waterfowl management and annual wetland plant production. Typically, the management scheme calls for shallow water in the late summer, spring, and fall and lower or no water through the summer, which allows plants to germinate.	Diking Water control structure Pump water Shallow water excavation Plant desirable vegetation Control noxious weeds
Improve habitat structure	For a variety of reasons, habitat structure, including the composition of vegetation and how it is interspersed in a wetland, can be less than optimal. If a wetland has too much vegetation and too little open water, removing some vegetation can provide for more foraging and nesting habitat.	Plant desirable vegetation Control noxious weeds Control other vegetation Install nest boxes
Topography manipulation	Manipulating topography in effect manipulates water depths, a variety of which can support different species of wetland vegetation and provide habitat diversity.	Diking Shallow water excavation Blasting Island construction
Convert wetland type	It is possible to convert wetlands from one type to another, either to reduce exposure of contaminants or as a way to control invasive species.	Plant desirable vegetation Control noxious weeds Shallow water excavation
Reconnection	Wetlands that have been separated by levees or roads can be reconnected to restore their hydrology and other functions.	Breach levees Plug ditches
Protection	Following restoration, or as the principle restoration tool, intact wetlands should be protected to provide long-term benefits to wildlife.	Land acquisition Easement Fencing
Coordinate with cleanup programs	Because of widespread contamination in wetlands, restoration will rely on close coordination with cleanup. In addition, ongoing data collection on sediment transport and other parameters will inform restoration.	Technical assistance Joint prioritization Cap, flip, or remove contaminated soil Site equipment and material staging areas to avoid or minimize adverse impacts to natural and socio-economic resources

4.2 Streams

Streams in the Basin range from small, steep, forested mountain streams to large, mainstem rivers in lowland valley bottoms. They vary greatly in their condition from nearly pristine to highly degraded by Mine Waste Contamination. Most of the Basin has not been affected by Mine Waste Contamination. Some areas have few human impacts, while others have varying degrees of degradation unrelated to mining. However, more than 150 miles of streams and rivers are injured by the release, downstream transport, and deposition of Mine Waste Contamination. Streams and associated aquatic life that are particularly affected include the South Fork Coeur d'Alene River, Canyon Creek, Ninemile Creek, and the mainstem Coeur d'Alene River. Adjacent to these affected areas are some stream systems uncontaminated by Mine Waste Contamination. Cleanup has already improved water quality and habitat in some parts of the Basin and continues to be planned for many other areas in the future.

Within this diverse environment, the Trustees will work to restore the biotic and abiotic processes that form and maintain functioning stream ecosystems that, in turn, provide habitat for fish, wildlife, and plant species. Restoration also benefits lost human uses derived from stream ecosystems such as fishing, swimming, and scenic riparian corridors.

The Trustees envision restored stream and riparian habitats that will provide a network of independent, functional conservation areas, linked by open migratory corridors. In these areas, sustainable processes will create and maintain the habitat required to support robust populations of native fishes and other aquatic and riparian species. This network will enable aquatic species to recolonize injured areas as water quality and habitat conditions improve, by providing a source of pioneer stock and open migratory corridors.

Characteristics of functional and sustainable stream and riparian ecosystems include:

- habitat components that recover natural stream processes and functions and support diverse aquatic communities;
- intact, protected strongholds and areas of refugia that will provide resiliency and protection to the aquatic community from natural and human-caused disturbance;
- open migratory corridors that will provide a linkage between areas for spawning, rearing, feeding, and overwintering for native fish and their varied life histories;
- riparian and floodplain habitat that will provide complexity for both aquatic and terrestrial species;
- improved water quality as a result of cleanup activities, natural reduction of contaminants, and restoration activities that are protective of the aquatic community; and
- stream ecosystems that support a variety of lost human uses such as fishing, swimming, and drinking water.

Streams Goal: Protect and restore injured streams and riparian habitats, species, and services.

Major Actions

- Restore habitat function and processes in stream and riparian habitats injured by mine waste.
- Protect and restore habitat function and processes in uncontaminated stream and riparian areas that will benefit injured resources.
- Restore migratory corridors where doing so will benefit injured natural resources.

4.2.1 Major Actions for Stream Restoration

The Trustees have adopted three complementary major actions. These prioritize restoration of areas directly injured by the release of Mine Waste Contamination and incorporate an approach that affirms the important contribution of nearby uncontaminated tributaries to injured areas and migratory corridors in the recovery of injured streams. Together, these major actions will facilitate the restoration of streams and associated riparian habitats toward baseline conditions.

Restore habitat function and processes in stream and riparian habitats injured by mine waste.

Within the area of the Basin directly injured by the release of Mine Waste Contamination, streams and riparian areas range from systems where cleanup projects have been completed, are ongoing, or planned, to systems where cleanup may not be undertaken.

Cleanup projects have been completed in numerous places throughout the Basin. In most of the Bunker Hill site, cleanup for ecological improvement is ongoing or planned. The South Fork Coeur d'Alene River Subbasin is the primary source area for mining-related waste material present in the Basin and is the current focus for ongoing and future cleanup actions. Extensive site characterization and modeling indicate that the majority of metals loading are from sources within East Fork Ninemile Creek, Canyon Creek, and South Fork Coeur d'Alene River near Kellogg. These areas are not only major source areas affecting the South Fork Coeur d'Alene River and Coeur d'Alene River floodplain, but are also areas where significant injury has occurred and continues to affect fish and wildlife resources. The 2012 Record of Decision Amendment (EPA 2012) outlines a 30-year timeline for cleanup actions in the Basin and the 2013 Implementation Plan (EPA 2013) provides further detail on priorities within a 10-year sliding time window, identifying these locations as the initial priority areas for cleanup actions. Cleanup activities are also planned for the Coeur d'Alene River and its floodplain.

Cleanup will address contaminant sources at specific locations resulting in significant improvements in sediment, soil, surface water, and groundwater metals contamination but will not fully address contamination at all locations in the Basin. In those areas where cleanup is not currently planned, cleanup activities at other locations and natural reduction of metals from dilution, flushing, and deposition of clean sediments will improve conditions over time. Although cleanup may not be conducted in these locations, these areas could provide important migratory corridors or other habitat functions that are crucial to establishing a network of restored aquatic and riparian habitat throughout the Basin.

Within the range of stream conditions described above, the Trustees propose to restore the natural processes that form, connect, and sustain habitats and the species associated with them.

The work proposed in this Plan is not intended to replace or duplicate efforts undertaken by EPA or other organizations, it is intended to complement cleanup by restoring additional features.

Features such as diverse vegetation communities and complex physical structure will assist remediated systems more rapidly return to full ecological function and be capable of sustaining reestablished aquatic and riparian species. See Table 4 for a detailed list of specific techniques.

In areas not considered for cleanup, where water quality limitations may persist until natural reductions in contaminants proceeds, the Trustees propose to identify streams that will likely play an important future role in resource recovery. If restoration of basic ecosystem processes in these areas is postponed until water quality improves, there will be a substantial time lag before habitat quality and ecological function can catch up. Addressing those habitats now would help set the stage for a rapid return to ecological function when water quality improves. Additionally, restoring connectivity and access to clean water refugia for species occupying unremediated sites will likely be important so aquatic organisms can avoid metals and recolonize areas as water quality improves.

The decision to conduct restoration in these areas will depend on the actual or anticipated results of cleanup and whether concentrations of metals pose unacceptable risks to fish and wildlife. Timing of restoration in relation to cleanup, feasibility, and cost-effectiveness will be particularly important considerations when selecting and planning projects. Additional project selection and implementation criteria are listed in Section 5.

Protect and restore habitat function and processes in uncontaminated stream and riparian areas that will benefit injured resources.

Restoration of injured resources towards baseline conditions in contaminated and remediated streams will partially depend on the supporting role of ecologically important streams next to injured areas. Restoration outside of injured streams will target areas that have direct, strategic relevance to recovery of injured resources.

Basin strongholds and refugia will play an important role in restoring streams and aquatic life communities. A biological stronghold is a stream, watershed, or other spatial unit where biotic populations are strong and diverse and the habitat has high intrinsic potential to support a particular species or suite of species. Refugia are distinct geographic areas or habitats organisms retreat to, persist in, and potentially expand from under changing environmental conditions or disturbance. The presence of strongholds and accessible refugia improves stability to plant and animal communities by helping to ensure they are resilient to disturbance and allows species and ecosystems to persist in the face of landscape changes (such as changing climate). Restoration and conservation of these areas provides the best opportunity for short-term persistence of fishes and will help ensure the availability of colonists to inhabit restored sites while additional restoration proceeds elsewhere in the Basin (Fausch et al. 2006; Magoulick and Kobza 2003; Gore and Milner 1990; Sedell et al. 1990; Huxel and Hastings 1999).

The Trustees propose to identify, conserve, and restore stream systems currently or potentially providing refugia or stronghold habitat for native fishes. Potential strongholds and refugia are not specifically identified or mapped in this document because the information to make a final selection of locations depends on data not yet fully assembled. The work will target streams that can make the greatest contribution to restoration of injured aquatic resources in contaminated or remediated areas, can be reasonably connected to disturbed areas based on value and practicality,

or strongly support broader trustee restoration goals. Restoration activities will use the process-based techniques summarized in Table 4.

Restore migratory corridors where doing so will benefit injured natural resources.

Aquatic species require connected habitats to fulfill their diverse life histories, including spawning, rearing, and feeding. Fluvial and adfluvial westslope cutthroat trout and bull trout can migrate several hundred kilometers between adult and spawning and rearing habitats (Gowan et al. 1994, Fausch and Young 1995). Resident forms of these species also need the ability to migrate in a given tributary stream to spawn, rear, or seek overwintering habitat (Hoffman and Dunham 2007). Other aquatic species in the Basin, such as macroinvertebrates, amphibians, and mollusks, also rely on open migratory corridors to fulfill life history requirements (Vaughn et al. 2009).

Migratory corridors in the Basin have been fragmented by a range of man-made barriers and water quality conditions such as elevated water temperatures and high metals concentrations. Restoration of aquatic species throughout the Basin will depend on having open stream networks that allow species to migrate to breeding, feeding, and sheltering habitats. Likewise, recolonization of areas where populations have been reduced or extirpated by Mine Waste Contamination will depend on removing barriers. Restoring access to refugia will be especially important for the survival and expansion of organisms into areas such as the South Fork Coeur d'Alene River where seasonal low flow can result in elevated metals concentrations that create pressures on aquatic organisms to temporarily move to areas with adequate water conditions. In other areas, barriers that block access to cold water side channels of rivers can be removed to allow fish into these refugia when water temperatures in the main channel become too warm.

In addition to supporting a diversity of aquatic organism life cycles, open migratory pathways and connectivity are essential for networks of strongholds and refugia to function effectively in support of restoration. The Trustees propose to identify and, where appropriate, remove migration barriers that limit the survival and restoration of injured native fishes. Restoration will focus on reestablishing migration corridors among clean water refugia, identified strongholds, and injured streams to facilitate reestablishing self-sustaining aquatic communities in metals contaminated areas. It may also be necessary to restore migration corridors at other locations in the Basin to achieve injured natural resources restoration goals.

The Trustees propose to identify and, where appropriate and feasible, remove migration barriers that limit restoration of native fishes in injured areas. In particular, the Trustees will focus on restoring connectivity between streams with high metals concentrations and clean water refugia, and restoring migration corridors between identified strongholds and injured streams to facilitate recolonization and reestablishment of self-sustaining aquatic communities.

Although ecosystem connectivity is important, in some instances it may be desirable to have barriers in place to intentionally isolate native fish populations if the threat of connectivity is deemed greater than the threat of isolation. Risks of connecting migratory corridors include potential invasion of disease or nonnative species bringing competition, predation, or hybridization. Risks associated with isolation include potential loss of populations caused by genetic, demographic, or environmental failures if the patch size and quality of isolated habitat are inadequate. Decisions regarding isolation and reconnection will be guided by the risks associated with each condition.

4.2.2 Priority Areas

The Trustees will focus on stream and riparian areas in strategic areas that are divided into three tiers of priority to geographically focus major stream restoration actions. These tiers are based on the needs of injured westslope cutthroat trout and bull trout and will enable restoration of habitat function and processes that will benefit aquatic and riparian communities. The highest priorities for restoration are areas directly injured by mine waste or areas right next to stream segments contaminated with metals. Locations outside of injured areas will also be considered where restoration activities have the greatest chance of helping injured aquatic and riparian resources. The Trustees will identify and restore migratory corridors that are important for fish to move between contaminated and uncontaminated watersheds and allow for migratory life histories and future recolonization of areas where fishes have previously been extirpated or substantially reduced. The Trustees will only consider stream projects that fall into one of the following tiers. Final project selection will be based on these tiers as well as the other criteria identified in Section 5.4.

Tier 1 priorities are streams and riparian areas injured by mine wastes or directly adjacent to and ecologically important to those areas. These include injured stream segments and subwatersheds in the South Fork Coeur d'Alene River Subbasin, Coeur d'Alene River corridor, and outlying areas with metals contamination such as the Prichard and Beaver Creek drainages. Metals-contaminated areas are the emphasis of this Plan and are the highest restoration priority.

Strategies to restore Tier 1 areas will depend on site-specific conditions. Restoration may take place at the same time cleanup occurs at some sites, after cleanup occurs at other sites, or at unremediated sites where concentrations of metals do not pose unacceptable risks to fish and wildlife.

Tier 1 priority areas also include stream segments such as habitat strongholds and species refugia directly next to injured areas. These include stream segments that are not injured by mine waste but are tributaries to injured waters that harbor migratory populations of westslope cutthroat trout (e.g., Coeur d'Alene Lake, South Fork Coeur d'Alene River). These nearby streams will play an important role to ensure remaining native westslope trout populations continue to persist in metals-contaminated areas and provide a local source of colonizing fish to help reestablish native fisheries in these areas.

The start of restoration projects in Tier 1 priority areas will depend in part on the status and pace of cleanup; therefore, restoration may not begin for more than 10 years at some locations. Due to the effort required to restore highly disturbed remediated areas, projects in Tier 1 areas may be relatively costly. However, the Trustees believe it is very important in Tier 1 areas to restore injured natural resources and their associated services where the injury occurred and they will prioritize these projects when feasible. The Trustees anticipate the largest investment in restoration of streams and riparian areas will occur in Tier 1 areas.

Tier 2 priorities are watersheds and watershed complexes providing spawning, rearing, and other essential habitat for threatened bull trout. These areas occur in the upper St. Joe River Subbasin and are important to ensure these fish are not vulnerable to extirpation. Restoring these bull trout habitats will support increasing population trends and expanding distribution of bull trout within their historic range where they were extirpated by factors including the releases of Mine Waste Contamination (USFWS 2014).

Tier 2 priority areas have the smallest geographic extent, are generally in the best condition, and have the fewest stream restoration needs. However, they encompass the only opportunities for stream restoration in the Basin to benefit areas currently inhabited by bull trout. Consequently, the Trustees place a high priority on these projects but anticipate a smaller investment being needed.

Tier 3 priorities are areas in the Basin neither directly injured by mine waste nor directly adjacent to those areas. These areas primarily occur within the St. Joe River, St. Maries River, and North Fork Coeur d'Alene River watersheds. Tier 3 priorities include areas within bull trout historic range that are currently unoccupied and may serve as bull trout expansion watersheds. In particular, there are restoration opportunities in the St. Joe River Subbasin that have the potential for reconnection and population expansion for this species. Tier 3 priorities also include areas that support or could support stronghold habitat for westslope cutthroat trout populations that are migratory (fluvial or adfluvial), occupy a unique geographic location, and are important to strengthening injured fish resources.

Tier 3 encompasses the largest geographic extent and has a great amount of restoration potential. However, because this tier is the farthest removed from injured areas, projects here have the lowest potential to improve natural resources in injured areas and are the Trustee's lowest priority. Restoration projects will be funded in these areas when they provide unique or timely opportunities, rank highly in our selection criteria, and when such projects provide the greatest cost-effective benefit to injured resources.

4.2.3 Strategies and Techniques

Regardless of where they occur in the Basin, restoration strategies and techniques will target basic processes that create and sustain aquatic habitats and support biological integrity. Projects that restore basic ecosystem processes and functions will help ensure habitats are sustainable and are suitable for stream species.

Many of the ecological processes that provide habitat for aquatic species in the Basin occur as the result of vegetation interacting with streamflow. Healthy riparian communities provide channel stability, protect water quality by filtering and storing sediment and providing shade, create physical habitat for fish (such as cover and channel complexity), and provide energetic inputs that sustain aquatic food webs. Therefore, riparian vegetation communities will be important to restoration success. Restoration will target short-term and long-term ecological process as follows:

- Long-term processes: Actions designed to restore and support long-term ecological processes will have a primary focus on restoring native streambank, floodplain, and riparian vegetation communities. Some streams may require restoration of basic channel geometry or addition of roughness sufficient to trap sediment and create deformable beds and banks. These features will then provide the substrate and structure to help the growth of future streambank and floodplain vegetation.
- Short-term processes: In some cases, actions (such as direct placement of complex woody debris jams) will be taken to provide habitat-forming elements in the short term to improve conditions while longer-term approaches described above take effect.

See Table 4 for an overview of stream restoration strategies and techniques that support the ecosystem processes focus of this Restoration Plan. The following list is not intended to be

comprehensive or exhaustive; rather it identifies broad approaches and common themes that will be promoted and practiced throughout stream restoration activities implemented under this Plan.

Table 4. Strategies and techniques for stream restoration

Strategy	Background	Techniques
Protection	Intact and newly restored riparian and aquatic habitats should be protected to ensure long-term function and persistence.	Easements Cooperative management agreements Protective measures such as fencing and traffic control Enhance stewardship through education and outreach Acquisition
Passive Restoration	Some aquatic habitats may have many or all of the necessary ecological "building blocks" in place and require only time and the process of natural succession to reach function.	In lieu of active restoration or rehabilitation, promote stewardship and protection through methods described above. Eliminate or reduce environmental stressors that slow the rate of recovery.
Restore diverse in-stream structure	Streams of the Basin need instream structure including boulders and woody debris jams to maintain natural bedform and to provide complex habitat for a variety of species. These structures are also critical to maintain a natural balance of trapping, sorting, and exporting sediment.	Place woody debris jams; installed jams should approximate the level of structural diversity, dynamic function, and complexity present in natural debris jams present in reference areas. Use streambank bioengineering and other soft techniques to restore roughness and vegetative structural complexity to banks.
Restore riparian and streambank vegetation	Many of the key habitat-forming processes that provide aquatic habitat occur as the result of plant materials interacting with streamflow. Riparian vegetation also provides the energetic inputs that sustain aquatic food webs.	Using reference areas where available, restore mix of native species appropriate for the setting and community type. Use snag creation and riparian silviculture to promote diverse horizontal and vertical structure. Remove undesirable vegetation (e.g., noxious weeds). Other noninvasive species may be desirable to plant to achieve short-term objectives such as temporary soil stabilization.
Restore channel geometry and sinuosity appropriate for the valley setting	Channels require stable bed forms on which to aggrade and store the deformable soft materials (e.g., gravels, sediment) that provide habitat and support vegetation.	Construct/reconstruct channels that approximate the dimensions and migration patterns of geomorphically analogous reference reaches. Install roughness (e.g., woody debris, bank toe fascines) on the beds and banks of reconstructed channels to trap sediment to support creation of key aquatic habitats and vegetative communities.
Restore natural resilience of streambanks to erosion and destabilization	Bank erosion and channel migration are natural aspects of stream function but rates can be accelerated due to watershed and streambank disturbances.	Use vegetation-based bioengineering techniques (in lieu of hardening approaches such as rip-rap) to restore vegetative capacity of banks to resist erosion as well as the complex roughness and diverse habitats associated with natural banks. Restore roughness of bank toes using vegetative material such as fascines and woody debris.

Strategy	Background	Techniques
Connectivity	Expansion of aquatic species throughout the Coeur d'Alene Basin will depend on restoring open stream networks that allow species to migrate to key breeding, feeding, and sheltering habitats.	Remove or provide passage through physical barriers, such as road crossings, tailings piles, dikes, levees, railroad grades, diversion structures, weirs, and other similar features. Manage non-native fish interaction with native salmonids Replace culverts with open-bottom structures that facilitate deposition of natural streambed materials. If open-bottom structures are not feasible, culverts should be designed to facilitate passage for all aquatic organisms, including poorly mobile species.

4.3 Lakes

Basin lakes range from less than 5 acres in nearly pristine headwater settings to the 28,000-acre Coeur d'Alene Lake dotted with shoreline homes and communities. There is a series of lakes that border the Coeur d'Alene River called the "Lateral Lakes." The lakes in the Basin provide habitat for plants, fish, waterfowl and wildlife, domestic drinking water, recreation, transportation, scenic beauty, spiritual and cultural values, and other important services.

The Trustees previously determined that the surface waters, sediments, benthic macroinvertebrates, zooplankton, and phytoplankton in Coeur d'Alene Lake and several of the Lateral Lakes have been injured by the release of Mine Waste Contamination, affecting the plant, fish, wildlife, and human uses associated with lakes (Stratus Consulting 2000). Furthermore, many of the shoreline and near-shore habitats of the area's lakes have been affected by hydrologic alterations, development, erosion, invasive species, and other factors.

The primary focus for lakes restoration will be lakes directly injured by mine waste, including the Lateral Lakes and Coeur d'Alene Lake (Figure 6). The Trustees will support restoration projects using the framework provided in this Plan for fish, waterfowl, wildlife, and human uses priority areas.

4.3.1 Coeur d'Alene Lake

Coeur d'Alene Lake plays such a critical and unique role in the region's identity, culture, and economy, and therefore, has unique restoration challenges. Coeur d'Alene Lake and its related resources have suffered significant injury due to contaminated sediments from mine wastes, which continue to be deposited from upstream sources. According to the U.S. Geological Survey, over 75 million tons of contaminated sediments exist at the bottom of Coeur d'Alene Lake (Horowitz et al. 1993). An additional 75 million tons are estimated to be located upstream in the Coeur d'Alene River floodplain. These contaminants are transported downstream, especially during floods, and are deposited in the bottom of Coeur d'Alene Lake or flow into the Spokane River. Coeur d'Alene Lake also receives significant nutrient loads on an ongoing basis (see Section 4.3.230). Metals and nutrients in the Lake interact in ways that could cause significant further injury to the lake and its related resources. A fish consumption advisory has been issued for Coeur d'Alene Lake by the State and the Tribe due to metals concentrations in fish tissues and associated human health risks (IDHW 2003 and 2016).

Cleanup plans approved by the 2002 record of decision include activities in and around the Lateral Lakes; however, the EPA has deferred a remedy for Coeur d'Alene Lake. Instead, an alternative approach for lake management is being used to manage contaminated lakebed

sediments through a Coeur d'Alene Lake Management Plan developed by the State and the Tribe. The overall goal of the Lake Management Plan is to protect and improve the water quality in Coeur d'Alene Lake by limiting Basin-wide nutrient inputs that impair the lake's water quality conditions; these nutrients influence the solubility of the metals contamination in lake sediments (IDEQ and Coeur d'Alene Tribe 2009). The Lake Management Plan goals strategically align with the goals and major actions in this Restoration Plan, which make them appropriate for strategic integration with this Restoration Plan.

The 2011 Consent Decree between Hecla Mining Company and the Trustees states, "A minimum of $10,000,000 of natural resource damages will be used for restoration of Lake Coeur d'Alene" (*U.S. v. Hecla*, 2011, paragraph 21) in accordance with CERCLA Sections 107(f) and 111(i). The Trustees will use 2011 Consent Decree funds designated for restoration of Coeur d'Alene Lake to strategically support the Lake Management Plan's programs and projects. Doing so leverages Coeur d'Alene Lake restoration funds with those of other partners, takes advantage of lake management plan staff expertise to help guide restoration of injured resources and prevent further injury to the Lake, and advances the goals and proposed action of this Restoration Plan.

Lakes Goal: Protect and restore injured lake habitats, species, processes, and associated services

Major Actions

- Protect and improve water quality in Coeur d'Alene Lake and other Basin lakes to benefit injured aquatic resources.
- Protect, preserve, and restore lake margin habitats valuable to fish, waterfowl, and other aquatic species.

4.3.2 Major Actions for Lake Restoration

Protect and improve lake water quality in Coeur d'Alene Lake and other Basin lakes to benefit injured aquatic resources.

Lakes are complex ecosystems that reflect various physical, chemical, and biological influences within them and their contributing watersheds. Conditions related to temperature, light levels, dissolved oxygen, and biological communities vary among lakes and within a single lake. Surface water quality is a natural resource injured by the release of mine wastes. In Coeur d'Alene Lake and several Lateral Lakes, surface waters contain concentrations of dissolved metals sufficient to injure wildlife and aquatic biological resources (Stratus 2000; EPA 2002; IDEQ 2014). Therefore, protecting and improving water quality in Basin lakes is a key major action for restoration.

Additionally, water quality is an important component of restoration because it:

- Integrates the basic physical, chemical, and biological properties of lake ecosystems and their watersheds which can be highly complex and variable. Therefore, it is an appropriate representative resource to target with restoration and measure effects.
- Is a vital component of fish and wildlife habitat in lakes, and it is a principal influence on trophic status, productivity, and food webs of lakes.
- Influences the further release of metals from lakebed (benthic) sediments in injured lakes.

Metals-contaminated sediments located in Basin lakebeds represent a significant risk to lake ecology when hypoxic conditions (low oxygen levels) occur in the overlying water column (Woods and Beckwith 1997). Excess nutrients, such as phosphorus and nitrogen, increase plant growth, which contributes to decreases in dissolved oxygen in the water column when the plants decompose (IDEQ and Coeur d'Alene Tribe 2009). When dissolved oxygen is low, geochemical processes known as "benthic flux" release metals into the water column and can cause further ecological injury and human health risks. Zinc inhibits algae production (Kuwabara et al. 2007), reducing the food base for zooplankton that feed on the algae. A reduction in zooplankton ultimately affects fish like westslope cutthroat trout and kokanee that rely on it as a food source. Consequently, metals inhibition initiates a "trophic cascade" up the lake food web that can reduce production of fish. Improving water quality will promote adequate dissolved oxygen and healthy food webs needed for aquatic life. In lakes injured by metals, restoration activities can reduce the release of metals from contaminated lakebed sediments. Because nutrients are key determining factors for dissolved oxygen, food webs, and benthic flux, they will be a particular emphasis of water quality restoration for lakes.

Some characteristics that make water quality restoration an important action in this Plan also make setting priorities and predicting outcomes challenging. Because water quality integrates such a complex and diverse set of conditions within lakes and their watersheds, it may be difficult or impossible to measure an ecological response from a single project. The scope and scale of water quality improvement opportunities for Basin lakes are extensive, particularly for Coeur d'Alene Lake, and the number of opportunities exceeds the available financial resources to effectively address them all.

Within the complex environment of Basin lakes, the Trustees propose a suite of restoration measures to improve water quality:

1. Conduct source inventories and trend monitoring

   Currently, insufficient information exists to support the Basin-wide identification and prioritization of projects to improve water quality in lakes. Thus, a focus of this Plan is to work with others to collect the information needed to identify, quantify, and inform prioritization of effective water quality improvement projects. The Trustees' cooperative focus will include supporting Coeur d'Alene Lake water quality monitoring as identified in Section 3.1 of the Lake Management Plan for 5 years in order to evaluate trends and inform decisions. In the future, the Trustees may select water quality monitoring studies for funding in line with supplemental criteria and guidelines of the implementation strategy (see Section 5.6).

2. Reduce the input of pollutants relevant to injured lake resources

   As information becomes available through nutrient source inventories, it will be used to accomplish on-the-ground restoration projects based on the following, in addition to the criteria of the implementation strategy in Section 5:

   a. estimated reduction of nutrient inputs to lakes
   b. identification as priorities by the Lake Management Plan nutrient source inventory or other assessment
   c. the extent to which the project provides additional fish and wildlife benefits
   d. project location within or outside of wetlands and streams priority areas

3. Increase the natural capacity of lakes to filter pollutants

   A naturally vegetated shoreline filters runoff, and can remove harmful chemicals and nutrients. See the "Lake Margin Restoration" section below.

4. Integrate water quality protection and improvement in watershed restoration

   Whenever possible, restoration implemented for wetlands and streams in other major actions of this Plan will be designed to maximize water quality benefits to downstream lakes. Collectively, this will protect and improve water quality in lakes.

Protect, preserve, and restore lake margin habitats valuable to fish, waterfowl, and other aquatic species.

Lake margin habitats comprise the littoral and riparian zones (Figure 5).

- **Littoral zones** extend from the edge of the lake to the greatest depth occupied by rooted plants and include both an emergent and submergent zones. These areas are dominated by rooted, emergent, floating, and submersed vascular plants along with their attached flora and fauna (Coeur d'Alene Tribe 2012). The submerged aquatic vegetation within littoral areas provides feeding areas for fish and waterfowl, while emergent vegetation provides breeding and feeding habitat for songbirds.
- **Riparian zones** form the transitional area between dry land and water. Vegetation communities in this area provide important environmental functions, such as regulating water quality (including temperature, clarity, nutrients, and contaminants), providing aquatic habitat structure for fishes and other organisms, and contributing scenic beauty. Shorelines are the fringe areas along the edge of a lake and connect the aquatic portion of the waterbody to the adjacent upland. Shorelines provide an area of critical ecological interface where land meets water (Winslow et al. 2014). The complex habitats associated with shorelines support plants, microorganisms, insects, amphibians, birds, mammals, and fish.

Lake margins represent the most ecologically diverse habitats associated with lakes due to the pronounced "**edge effect**." Much of the energy for lake food webs is derived from the terrestrial plant and animals that reside by the shore. Generally, 90 percent of all lake life is born, raised, and fed in this area, and 70 percent of land-based animals rely on habitats found in lake margins for some or all of their life history (Kipp and Callaway 2003).

Many of the lake-associated injured resources include species and resources that rely on healthy lake margins, as do many of the natural resource services provided by lakes, including human uses (for example, clean water, scenic beauty, recreational fisheries, or waterfowl hunting). Therefore, protection and restoration of the riparian and littoral zones of injured lakes is a major focus of this Plan.

Edge effect: In ecology, an "edge" is the boundary or interface between two habitat types or biological communities. Edges are typically characterized by greater species diversity and population density than occur in either of the individual communities.

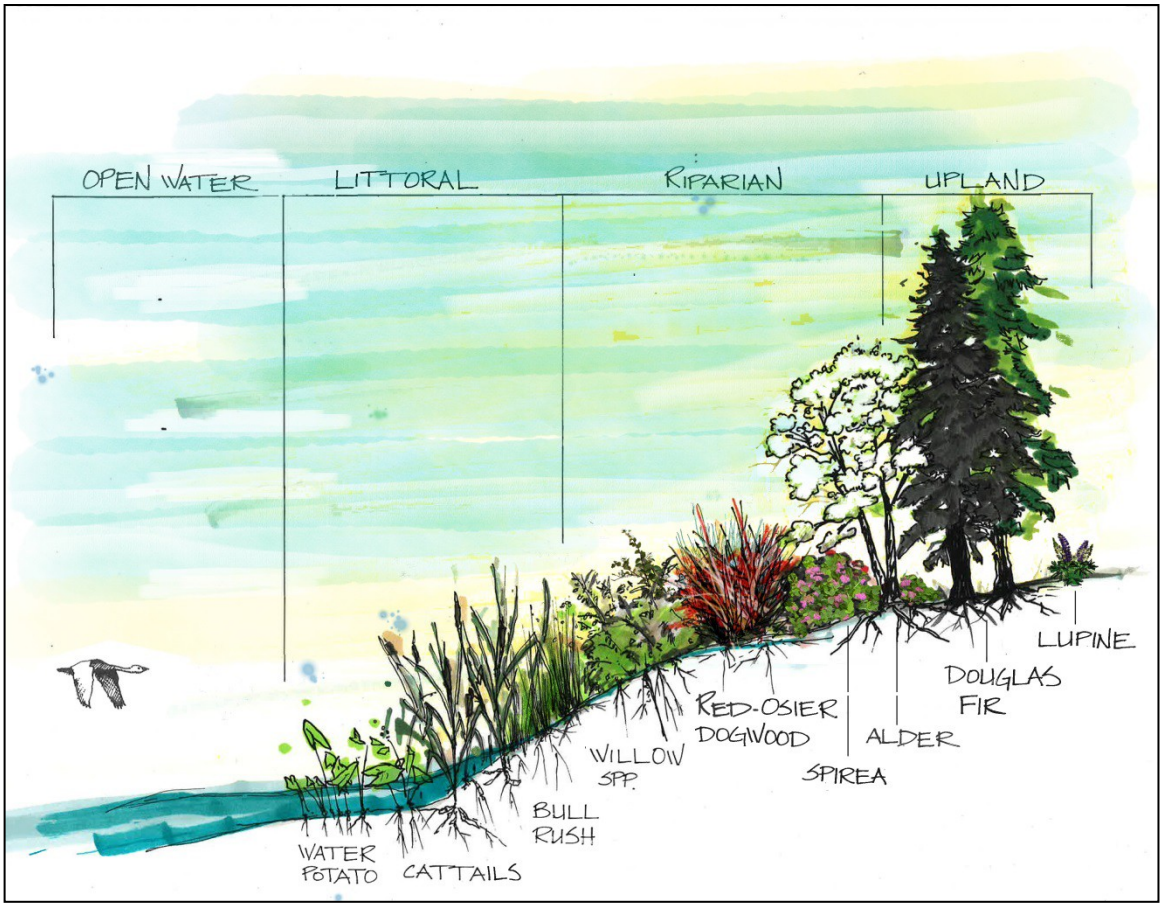

Figure 5. Lake margin habitats

Within lakes injured by the release of Mine Waste Contamination, the Trustees propose to restore the ecological functions and capabilities of lake margins habitats. Key actions include:

- **Protect and conserve intact lake margin habitats:** Intact shorelines and vegetation communities may serve as biological strongholds for populations of aquatic and terrestrial species, ensuring the persistence of these species while restoration improves conditions elsewhere. Intact lake margins may serve as reference areas to inform restoration design in other portions of the lake. The Trustees will work with partners and stakeholders to identify and map these areas, identify potential threats, and develop protection and conservation strategies to preserve ecologically significant habitats.
- **Restore riparian and littoral vegetation communities:** The intent of vegetation restoration is to protect and restore the ecological functions and ecosystem-wide processes performed by vegetation along lake margins shorelines. Restoring lakeshore vegetation also improves the capacity of lakeshores to resist erosion. Vegetation restoration will also include preventing the introduction and spread of invasive plant species such as Eurasian watermilfoil.
- **Reduce the influence of point-source pollutants on lake margin resources:** Where inventory data described in the previous section indicate that point-source pollutants are affecting the restoration outcomes in injured lakes, the Trustees will work with others to reduce or eliminate these effects both at the source as well as through restoring the inherent natural capacity of lakeshores to filter out pollutants.

- **Facilitate compensating for lost human uses associated with healthy lake margins**: Where such projects will not impede ecological restoration, identify opportunities to enhance recreational conditions, access, education, and other human uses that benefit from restored lake margins (also see Section 4.4).

See Table 6 for a list of strategies and techniques related to lake restoration.

4.3.3 Priority Areas

The Trustees will only consider lake projects that fall into one of the following tiers. Final project selection will be based on these tiers as well as the other criteria identified in Section 5.4.

Coeur d'Alene Lake

In this Restoration Plan, Coeur d'Alene Lake is treated as distinct and the highest priority for lake restoration due to its unique social and ecological context and regional importance as a lake resource. For example, it is the only lake in the Basin that still provides habitat for adfluvial bull trout as well as open water habitat for early season migratory waterfowl. The Lake also provides important habitat for adfluvial westslope cutthroat trout. The Lake's size (approximately 28,000 acres) and variety of uses make it socially, culturally, and economically important to the region. Coeur d'Alene Lake as a geographic priority area includes Chatcolet, Round, Hidden and Benewah lakes at the southern end of the lake because these lakes are hydrologically connected to Coeur d'Alene Lake and function as a single waterbody. These are **Tier 1** priorities.

Injured resources supported by Coeur d'Alene Lake will benefit from successful management of nutrient inputs. Effectively managing nutrients in the Lake benefits injured coldwater fish species such as westslope cutthroat and bull trout by helping to maintain adequate oxygen levels in areas where temperatures are suitable for these species. Where nutrient management can be used to reduce excessive macrophyte growth in shallow areas or near the mouths of fish-bearing tributaries, there may be some benefits to migratory fish through a reduction in habitat for nonnative predators, such as northern pike. In addition, a myriad of chemical, physical, and biological changes have occurred within the lake, along its near-shore areas, and in adjacent uplands that further exacerbate the natural resource injuries.

Other Basin Lakes

Lake restoration priority areas for Basin lakes other than Coeur d'Alene Lake were guided by contamination levels and waterfowl and fish use (Table 5). Limited data are available for occurrence and strength of adfluvial trout populations. As more data become available, they will be used to better refine priority rankings. Other Basin lakes were divided into the following tiers:

- **Tier 2 priorities** are lakes or lake complexes with high waterfowl use, and/or native trout populations, and are directly impacted by metals associated with Mine Waste Contamination.
- **Tier 3 priorities** are lakes that provide habitat for waterfowl and/or native trout, and are near metals-contaminated sites but may or may not be affected directly by metals.
- **Tier 4 priorities** are all other lakes. The Trustees do not anticipate restoration will occur for Tier 4 Lakes due to their distance from metals-contaminated sites, potentially low waterfowl and/or adfluvial trout use, or relatively healthy condition as compared with other tiers. Lakes in this category may be assigned to a higher priority tier if updated information indicates they provide important habitat for focal species or are necessary for the restoration of injured resources.

Table 5. Lakes assigned to four tiers of restoration priority areas

Tier	Lakes
Tier 1	Coeur d'Alene Lake (area includes Chatcolet, Benewah, Hidden, and Round lakes)
Tier 2	Anderson Lake, Black Lake, Cave Lake/Medicine Lake, Killarney Lake, Swan Lake, Thompson Lake
Tier 3	Fernan Lake, Hepton Lake, Bull Run Lake, Rose Lake, Blue Lake
Tier 4	Twin Lakes; Hauser Lake; Hayden Lake; Crystal Lake; Revett Lake; Elsie Lake; Lost Lake; Unnamed Lake – Gold Creek; Upper Stevens/Lone Lakes; Upper Glidden Lake, Lower Glidden Lake; Crater Lake; Crow Lake – Red Raven Creek; Halo, Bacon, and Forage Lakes; Saint Joe and Frog Lakes; Dismal Lake; Avondale Lake; Alpine Lake; Chilco Lake

Prioritization within Lakes

There are 150 miles of shoreline around Coeur d'Alene Lake alone in addition to shoreline adjacent to injured Lateral Lakes. Restoration needs are therefore expected to exceed available resources. Thus, the following will be used to prioritize lake margin projects within lakes:

- The highest restoration priority will be areas identified as important for waterfowl and native fisheries.
- Restoration will also be considered where high visibility and access provide demonstration of innovative restoration techniques.
- Projects for near-term human use benefits will be considered where they overlap with focal resource priorities and demonstration opportunities.

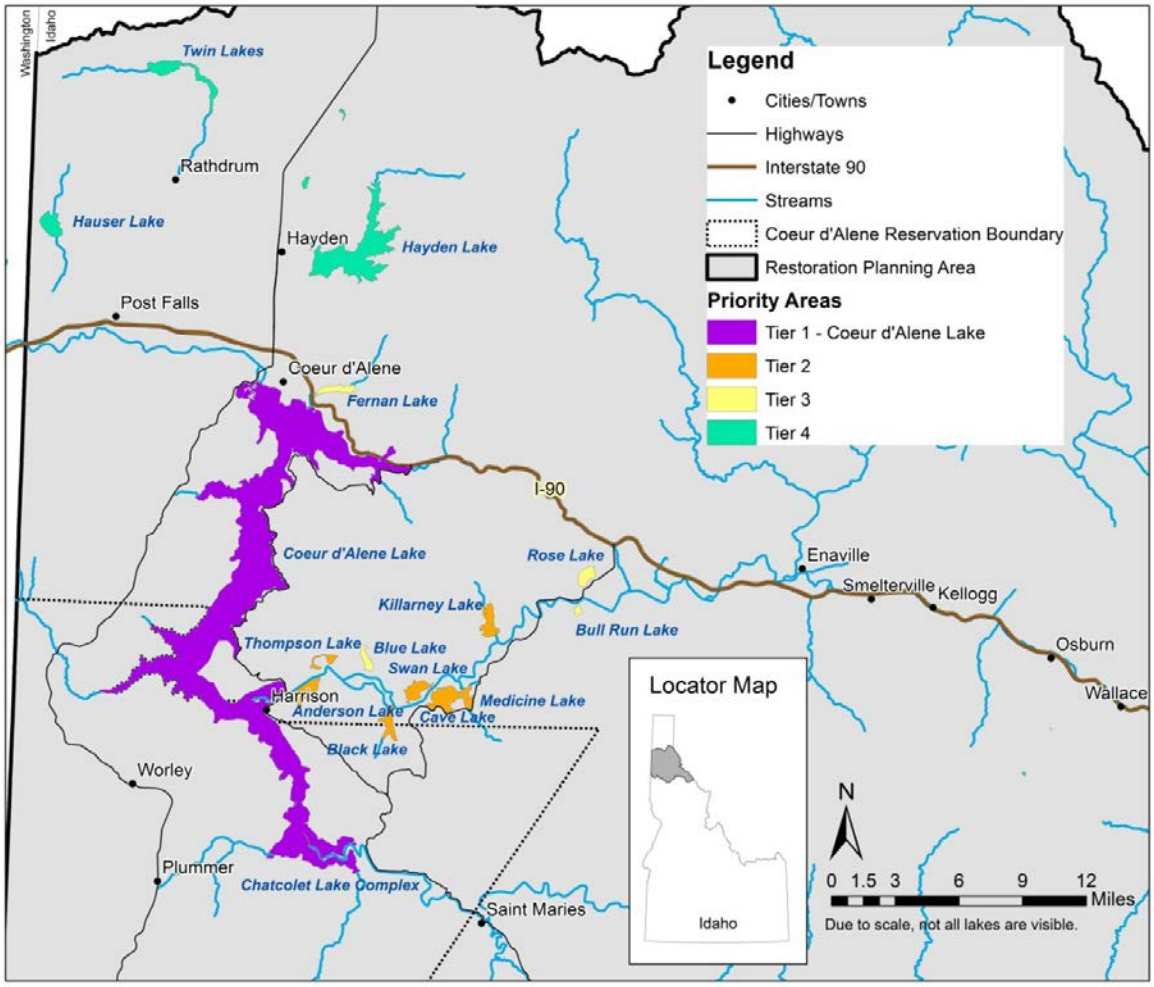

Figure 6. Lake restoration priority areas

4.3.4 Strategies and Techniques

See Table 6 for an overview of lake restoration strategies and techniques that support the ecosystem processes focus of this Restoration Plan. The following list is not intended to be comprehensive or exhaustive; rather it identifies broad approaches and common themes that will be promoted and practiced throughout lake restoration activities implemented under this Plan.

Table 6. Strategies and techniques for lakes restoration

Strategy	Background	Technique
Support the development and refinement of tools to predict, measure, and evaluate the effectiveness of lake restoration projects.	The ability to forecast water quality conditions and predict the effects of proposed restoration on lake water quality will help inform project selection, prioritization, and design. This information will also help predict the effects of the environmental changes on lake water quality that can help adjust restoration strategies and techniques.	Support the data collection to further refinement of the Aquatic Ecosystem Modelling 3D (AEM3D) or other analytical tools. Support long-term water quality trend monitoring in Coeur d'Alene Lake.

Strategy	Background	Technique
Support the design and implementation of source inventories for nutrients relevant to priority lakes.	Given the ubiquitous nature of nutrients, a source inventory is necessary in order to identify priorities for reduction.	Support efforts such as Lake Management Plan Section 5.3 Strategic components 1 and 2 - Design and conduct a nutrient source inventory and prioritize projects based on that inventory.
Increase understanding of nutrient cycling, food web dynamics, metals remobilization and other key processes	Better understanding will result in more effective lake restoration, particularly with respect to effects of metals and nutrients on water quality of injured lakes.	Support research such as Lake Management Plan Section 3.1, Special Studies.
Increase public awareness of and engagement with stakeholders of lake conditions and actions they can take to improve lakes water quality.	Public awareness and community understanding is paramount for protecting and restoring lakes and its related resources. Engaging others increases restoration effectiveness, improves land management activities, and leverages restoration funds.	Support symposia and other stakeholder engagement opportunities. Support education outreach such as the Lake-A-Syst project.
Incorporate lakes water quality considerations into streams and wetlands habitat restoration projects conducted as part of this Plan.	Influences on lake water quality are basin-wide (EPA 2015). Restoration projects in streams and wetlands elsewhere in the Basin implemented as part of this Plan will help improve water quality in downstream lakes.	See Streams and Wetlands Strategies and Techniques tables.
Use source inventories and nutrient reduction action plans to identify and implement projects that reduce nutrient inputs where relevant to injured natural resources.	Reducing nutrient inputs to lakes can slow human-caused eutrophication and minimize solubility of metals to benefit injured natural resources and prevent further injury.	Employ techniques in Streams and Wetlands sections. Shoreline revegetation (see below) Partner in cost-share agreements to reduce nutrient inputs from priority sources (e.g., improvements to waste water treatment plant discharges, failing septic tanks)
Restore the vegetation and physical structure of shorelines and near-shore areas.	Vegetation is the key functional element that protects water quality and lakeshore integrity as well as provides habitat for aquatic and terrestrial species.	Plant desirable vegetation Control undesirable vegetation Reshape banks Bioengineering, demonstration projects, etc. Install log and rock structures Move, remove, or improve roads adjacent to shorelines to reduce impacts to surface water and fish habitat.
Protect and preserve shorelines and other lake habitats.	Lake habitats will be protected and preserved from further degradation that could further harm injured resources.	Acquisition Easements Fencing Incorporate resource protective features at recreation sites such as light penetrating boardwalks.

Strategy	Background	Technique
Survey invasive species.	Early detection of invasive species is often necessary for successful control and removal. Mapping of existing populations is necessary to develop effective strategies to manage invasive species.	Support ongoing efforts by other entities to detect, identify, and map invasive species presence and distributions. Enlist the public's help to identify and manage nonnatives through supporting education and outreach programs about the potential threats posed to lakeshores from nonnative species.
Prevent the spread and establishment of invasive species.	The most effective strategy against invasive species is to prevent them from ever being introduced and established. Once they are established, the soil disturbance associated with many restoration projects invites colonization by invasive species that, once established, can undermine restoration efforts and lead to further spread of the invasive species.	Ensure restoration produces rapid native species revegetation on disturbed soils Use weed-free soils and fill in lakeshore restoration projects Use native species plants and seed mixes in lakeshore revegetation Support efforts to educate the public about potential threats posed to lakeshores from invasive species and measures they can take to avoid introduction.
Control and/or eradicate aquatic, fish, and plant invasive species	Without eliminating the threats posed by invasive species, restoration efforts run the risk of being undermined by the effects of invasive species.	Support efforts by other entities to reduce the spread of or eliminate invasive species that may affect restoration.
Use inventories of adfluvial populations	In order to prioritize lakes that harbor adfluvial migratory populations for restoration activities, inventories need to be conducted.	Support efforts that re-establish native fish populations.

4.4 Human Use Projects

The Coeur d'Alene Basin Restoration Plan integrates ecological restoration of injured wetland, stream, and lake ecosystems with funding for "Human Use Projects," which are intended to provide some compensation for interim natural resource service losses due to the injury to natural resources in the Basin, specifically lost human uses of natural resource services, including natural-resource-based uses unique to the Coeur d'Alene Tribe.

Human uses are the tangible and intangible benefits people derive from the services provided by natural resources and include:

- ecosystem functions that are essential to human existence such as clean water, flood control, nutrient and sediment filters, and food web dynamics; and
- amenities shaped by individual and community values (including those values unique to Tribal culture), preferences, and demands, such as recreation opportunities, hunting, fishing, gathering, traditional ceremonial uses, scenic values, and maintaining a community's sense of place.

At other injured sites where compensatory damages for interim service losses were involved, the natural resource trustees found that there were so many demands for lost human use projects that it was difficult to maintain ecological restoration efforts on the injured natural resources

themselves. To address this very real concern and ensure that the core work under this Plan is focused on natural resource restoration, while still providing some compensation for interim lost human uses of natural resource services, the Trustees decided to cap the total amount of recovered damages that could be spent on Human Use Projects under this Plan at ten percent (10%). That maximum ten percent allocation can be used for two categories of Human Use Projects which are described in the following two paragraphs.

Human Use Projects Dependent on Ecological Restoration Projects: To speed up the recovery of services lost to the public because of injury to natural resources in the Basin, the Trustees may allocate up to five percent (5%) of available restoration funds to Human Use Projects associated with other ecological restoration projects in the Basin. Examples of such projects include, but are not limited to: a dock that is connected to a lake restoration project, or a raised walkway and interpretive signs that are associated with a wetland restoration project.

Human Use Projects Independent of Ecological Restoration Projects: The Trustees may allocate up to another five percent (5%) of available restoration funds for Human Use Projects that would provide near-term compensation for the natural resource services lost to the public due to natural resource injuries caused by releases of Mine Waste Contamination in the Basin. These projects need not be tied to primary natural resource restoration projects and could be implemented in either the Basin or in the area that drains into the mainstem of Hangman Creek and its tributaries located within the exterior boundary of the Coeur d'Alene Reservation ("Hangman Creek Watershed"). These projects will typically improve access or use of natural resources, support environmental stewardship and education, and strengthen community heritage and cultural connections to natural resources. Examples of such projects include, but are not limited to, a dock that is not otherwise connected to a lake restoration project or a raised walkway and interpretive signs that are not specifically associated with a wetland restoration project.

Allocating up to 10 percent of all restoration funds (see Figure 7 below) for Human Use Projects allows the Trustees to respond to public input requesting these types of projects and ensure that projects address the wide range of losses, both human use and ecological, stemming from natural resource injuries in the Basin. The key to these Human Use Projects is that they have a direct link to injured natural resources in the Basin and the services they provided, and that they minimize harm to ecosystem integrity.

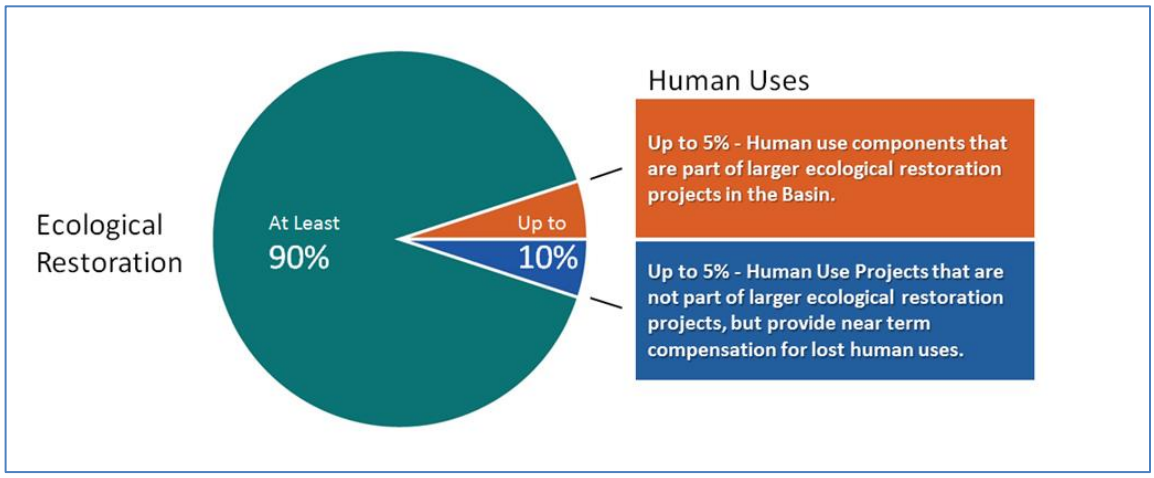

Figure 7. Distribution of Ecological Restoration and Human Use Project funds

Human Use Projects Goal: Compensate for human uses of natural resource services that were lost due to the release of Mine Waste Contamination. This includes the cultural, recreational, and other human use services that connect both Basin residents and visitors to natural resources and contribute to a community's desired "sense of place."

Major Actions

- Restore and facilitate recreational and other opportunities associated with the use of restored natural resources.
- Enhance opportunities for people to connect to Tribal and non-Tribal cultural resources that contribute to local and regional heritage and sense of place.
- Provide targeted scenic improvements to viewsheds.
- Promote stewardship of natural resources and support education associated with cleanup and restoration.

4.4.1 Major Actions

Restore and facilitate recreational and other opportunities associated with the use of restored natural resources.

Natural-resource-based recreation is an activity affected by the historic release of Mine Waste Contamination that lends itself to projects that can be accomplished more quickly than others. Natural-resource-based tourism and recreational opportunities can provide new and improved avenues for employment, positive economic impacts, and foster a broad local interest in environmental stewardship. Projects might include improved recreational access to waterways, observation blinds or platforms, and educational kiosks along improved trails. Natural-resource-based tourism and recreation opportunities encompass traditional, new, and emerging trends in outdoor recreation and can meet the needs of diverse and dynamic public interests now and into the future.

Enhance opportunities for people to connect to Tribal and non-Tribal cultural resources that contribute to local and regional heritage and sense of place.

Residents of the Basin historically relied on the bounty of natural resources the area has provided. Protection or enhancement of culturally and historically significant natural resources can affirm a community's "**sense of place"** by honoring the local heritage of the Basin and the role that natural resources have played in the history and culture of the Basin. The Trustees recognize the cultural significance of the Basin to all members of the public and anticipate public stakeholder involvement to engage in highlighting the history of the Basin through natural resource restoration projects.

Examples of how restoration efforts can help residents and visitors connect to the rich history of the area include using traditional Tribal subsistence plants in restoration projects involving revegetation, or highlighting historical mining areas with informational signs next to natural resource restoration projects.

Sense of Place is the geographic identity and human experience of a place; the where and how an individual–or a community—identifies with and experiences the natural landscape.

Provide targeted scenic improvements to viewsheds

Injuries and some cleanup work have left portions of the Basin visually unappealing, and natural recovery could take decades. Improving select "**viewsheds**" where injuries occurred can improve recreational experiences, foster increased tourism, and provide socio-economic benefits to local communities. Consequently, visual enhancements to degraded viewsheds promote economic resilience, which is an important trustee value.

Viewshed projects that have an ecological restoration component are of particular interest because they can accomplish multiple objectives.

Viewsheds are open spaces readily visible to the public where there is a particular interest or historic value deemed worthy of preservation.

Promote stewardship of natural resources and support education associated with cleanup and restoration

Education promotes stewardship of natural resource restoration. The Trustees recognize the community's desire to support natural resource education and outreach programs in Basin area schools, summer camps, and after-school community youth programs. For example, there might be opportunities to engage youth groups to help plant vegetation as a component of a riparian restoration project while learning about the benefits of having a strong native plant community next to aquatic ecosystems.

4.4.2 Priority Areas

Priorities for where ecosystem restoration occurs are driven largely by the location of injured resources across the landscape and the biological and physical processes that influence them. In contrast, priorities for where Human Use Projects can be accomplished relatively soon are driven largely by societal values, public input, the constraints of the purpose of this Plan, and legal mandates. During the public comment period, the Trustees received input on local values and desired locations for restoration.

Some of the geographic areas and project approaches identified by the public during scoping included the following:

- **Coeur d'Alene Lake** – restore tributaries that flow into the lake that have potential to support native salmonid populations.
- **South Fork Coeur d'Alene River Subbasin** – to be cost-effective, start restoration work upstream of where EPA is doing cleanup.
- **South Fork Coeur d'Alene River** – restore areas along the South Fork Coeur d'Alene River to provide safe public access that can serve as an asset rather than a liability.
- **North Fork Coeur d'Alene River** – restore areas in the North Fork Subbasin where there is a high use of rafting and tubing to make access safer for the public and protect existing riparian areas.
- **Coeur d'Alene River floodplain** – restore areas that do not pose a risk to recontamination and can limit human health risks to contamination exposure.
- **Basin-wide** – focus on areas where public access can be enhanced or improved.

- **Trail of the Coeur d'Alenes** – partner on restoration projects along the trail to highlight the area's history.
- **Hangman Creek Watershed** – support projects that provide the Coeur d'Alene Tribe with natural resource services, including interim lost human uses, that are analogous to the natural resource services and human uses lost in the Basin due to Mine Waste Contamination.

The Planning Area includes the Coeur d'Alene Basin; however, due to the extent of contamination in the Lower Basin and limited feasibility for comprehensive remediation, opportunities to compensate for interim natural resource service losses that are important to the Coeur d'Alene Tribe within the hydrologic boundary of the Basin are limited. Therefore, Human Use Projects designed to address lost human uses important to the Tribe would be considered outside of the Basin only in the portion of the Hangman Creek watershed located within the exterior boundary of the Coeur d'Alene Reservation.

The Trustees value the engagement and input they received from the public and will continue to work with the Basin communities when identifying Human Use Projects. To better understand the social, economic, cultural, and recreational values of the community, the Trustees will use tools such as surveys, public meetings, and emerging technologies to guide geographic preference based on social values. These methods will provide information needed for decision makers and researchers to evaluate the social values as they relate to human uses of natural resources. These methods can help facilitate discussions with diverse stakeholders regarding the tradeoffs among different uses in a variety of physical and social contexts.

4.4.3 Strategies and Techniques

See Table 7 for an overview of Human Use Projects strategies and techniques. The following list is not intended to be comprehensive or exhaustive; rather it identifies broad approaches and common themes that will be promoted and practiced throughout Human Use Projects implemented under this Plan.

Table 7. Strategies and techniques for Human Use Projects

Strategy and Background	Techniques
Improve recreational infrastructure at contaminated sites and reduce exposure risks for human health.	Construct or improve access sites and trails Paving, boardwalks or other means of reducing risks of contact with contaminated soils Partner with EPA, Panhandle Health District, land managers, and others
Improve infrastructure and provide recreational opportunities at uncontaminated sites.	Construct or improve access sites and trails Swimming areas in lakes and rivers Partner with land managers Land acquisition Conservation easements
Improve scenery where doing so meets social and ecological objectives.	Tree and shrub plantings Promote environmental stewardship i.e. "Leave no Trace"
Enhance opportunities to learn about natural resources in the Basin.	Observation blinds Improved access Educational kiosks

Strategy and Background	Techniques
Support natural resource educational efforts with other Trustees.	Assist with production of environmental curricula Hands on demonstration projects Outdoor classrooms
Enhance opportunities for people to connect with cultural resources.	Restore, replace, and/or acquire the equivalent of natural resources in order to protect culturally significant areas for Tribal and non-Tribal community members Work with Tribal elders and community leaders to develop interpretive programs to increase awareness of important cultural areas Provide for subsistence hunting and fishing opportunities
Restore lost or degraded Tribal connection to injured natural resources.	Conduct restoration projects near Tribal population centers to encourage and reinforce traditional cultural uses of natural resources Share information with the Tribe about uncontaminated areas within the Basin suitable for traditional use
Restore wildlife-based recreational opportunities and preserve natural open space.	Interpretive trails Viewing, hunting, fishing, and trapping opportunities

5. Implementation Strategy

This section details how the Trustees will implement the Restoration Plan, including the approach the Trustees will use to translate the broad-scale ecological objectives of the Plan into on-the-ground restoration results. The implementation strategy describes how projects will be identified, prioritized, funded, and implemented.

5.1 Timing of Restoration

The timing of restoration will depend on balancing many factors:

- strategic sequencing of projects to maximize efficiency and effectiveness;
- submission of quality proposals that meet the purpose, need, and priorities of the Restoration Plan, as well as statutory requirements;
- limits on the annual administrative capacity of agencies/governments to permit and initiate work;
- a desire to initiate restoration quickly;
- limits on contractor capacity to get work completed;
- uncertain and dynamic future opportunities regarding the location of work and financial partnership opportunities;
- risk of recontamination;
- land use and natural disturbance; and
- need to coordinate restoration efforts with co-occurring ground disturbing actions by other entities (for example, Avista or NRCS) to reduce likelihood of adverse cumulative effects.

The Trustees anticipate, but are not constrained to, spending restoration funds at a rate of 2 to 6 million dollars per year, resulting in an approximate 20- to 30-year scope of work. This estimate is based on the construction capacity of local contractors and the administrative capacity of the

managing agencies. The actual spending rate will depend on the submission of quality proposals, the scale of project work, and strategic partnership opportunities.

The Trustees will implement projects in a strategic sequence to minimize risk, improve operational efficiency, minimize costs, and reduce the overall time required to achieve restoration objectives. Typically, restoration follows cleanup and work proceeds in an upstream to downstream sequence to prevent re-contaminating areas where work has been completed. However, while much of the restoration work will be focused on cleanup areas, the Trustees expect to direct an equal or larger portion of the restoration funds toward projects in areas of high ecological importance outside the areas being remediated. This approach may include projects both inside and outside contaminated zones that improve broader ecosystem functions for the benefit of injured resources.

Examples include, but are not limited to:

- removing fish passage barriers to provide connectivity between restored areas and the broader watershed;
- improving habitats next to remediated sites that act as both source and refuge areas for fish and wildlife in remediated sites;
- preparing degraded portions of the ecosystem to be recolonized by species in anticipation of improved water and sediment quality that results from cleanup work, which shortens the time lag to full recovery (e.g., the South Fork Coeur d'Alene River); and
- improving degraded wetlands at sites with low or controllable risks of recontamination.

5.2 Integration of Restoration with Cleanup

Integrating restoration with cleanup is a strategic trustee priority and the Trustees intend to direct significant funding toward restoration projects that complement cleanup by EPA and others as it occurs. The Trustees will regularly review planned, active, and completed cleanup actions by EPA and others to determine whether such actions can be integrated with restoration projects. Restoration projects in locations where cleanup is planned, actively occurring, or completed are a priority for the Trustees when such projects support returning injured natural resources toward baseline condition. Likewise, where feasible, the Trustees will reduce the risk of short-term cumulative adverse impacts by coordinating the timing and nature of ground-disturbing restoration projects with projects being directed by EPA or others.

Planned cleanup activities include actions to benefit both human health and the environment. Cleanup activities targeting environmental improvements for the South Fork Coeur d'Alene River Subbasin include expanded water treatment, and remedial work at sites in Canyon Creek, Ninemile Creek, and others. Other activities primarily targeting human health include protection of existing remedies, treatment of contaminated roads, and the Basin Property Remediation Program.[15] Proposed cleanup activities for the Coeur d'Alene River floodplain include stabilizing banks; dredging contaminated sediments; and the excavation, removal, and capping of soils in wetlands (EPA 2002). The EPA and others continue to collect data, conduct analysis and modeling, and implement pilot projects in the Basin to support the future development and evaluation of cleanup alternatives. At many of these locations, restoration may be conducted at the same time as cleanup activities or once cleanup is completed.

[15] For more information, refer to EPA 2002, 2012, and 2013.

EPA deferred a remedy for Coeur d'Alene Lake and supported the Lake Management Plan as an alternative approach to address metals contamination within the Lake. Restoration affecting Coeur d'Alene Lake may occur while the Lake Management Plan is being implemented or during cleanup by EPA in the future, if warranted.

Although opportunities to integrate restoration with cleanup are a strategic priority in this Plan, restoration will not be limited to locations where cleanup activities occur. Restoration in nearby areas of high ecological value can provide temporary refugia and source populations of species and can add physical and ecological connectivity that help stabilize, support, and enhance restoration in remediated areas. Furthermore, many areas within the Basin affected by Mine Waste Contamination are currently not targeted for cleanup. Restoration efforts outside of cleanup are necessary to achieve the goals of this Plan.

5.3 Project Solicitation and Workplans

Under this Plan, the Trustees will solicit restoration project proposals through an open public process. Projects that help fulfill the Restoration Plan mission, achieve restoration goals, fit the criteria laid out in this Plan, and satisfy the statutory requirements will be considered. Proposals will be evaluated according to the selection criteria, and the Trustees will determine which projects will be funded.

Project proposals can be submitted by the Trustees themselves; private citizens; businesses; nonprofit organizations; local, State, and Federal agencies; Tribal government; and others. However, proposals must be co-sponsored by at least one of the Trustees for project administration purposes.

The solicitation process will consider all restoration project proposals. However, the Trustees will also conduct targeted solicitation for specific project types or projects in certain geographic areas and prioritize them for funding. For example, if a restoration priority is aquatic habitat connectivity in a particular subbasin, the Trustees could solicit projects that remove fish passage barriers in that area. If there are not enough proposed projects that meet the goals and objectives of this Plan and fulfill the selection criteria, there may be periods of times when projects are not funded.

The Trustees will prepare short-term (3 to 5 years) strategic workplans based on this Restoration Plan to guide targeted solicitation of projects. The strategic workplans will describe focal natural resources and associated geographic areas to conduct restoration activities, monitoring, and education/outreach actions most appropriate for restoration during the timeframe based on cleanup progress, ongoing resource management in the Basin, and current data.

The strategic workplans will emphasize project types and geographic areas rather than specific projects; this is necessary because restoration will achieve ecologically and strategically complex goals based on information not fully available to develop portions of major actions. For example, this Plan identifies migratory corridors as a restoration priority, but a comprehensive inventory of aquatic barriers is not available. The workplans may identify data gaps like this, facilitate data collection, and then identify priority watersheds for barrier removal. A targeted solicitation could then request proposals for those priority watersheds and project designs can be developed to remove the barriers.

Workplans will include streams, wetlands, lakes, and Human Use Projects, and restoration will likely focus first on projects ready for implementation with planning, designs, environmental

analysis, and permitting (if applicable) largely complete. Projects will also likely focus on capacity building for the future, strengthening partnerships, and unique opportunities, all of which are established as high priorities in this Plan. The Trustees will use interagency coordination and public outreach to gather additional input and ideas to shape the next set of workplans. The workplans can be adaptable to changing circumstances within the overall guiding framework of this Plan.

5.3.1 Ecological Projects

The goals of this Plan are ecologically and strategically complex. Some of the major actions may be best accomplished through a coordinated set of individual actions that collectively accomplish a larger objective (for example, establishing a strategic network of interconnected native fish strongholds and refugia, connected by critical migratory corridors, that facilitate recolonization of injured streams). Accomplishing a coordinated set of projects may require integrating diverse technical components and complex, multi-project sequencing in order to be effective. In some cases, there may not be enough information to fully develop some portions of the major actions.

To help develop, prioritize, and select these projects, the Trustees will:

- identify spatial units (such as the South Fork Coeur d'Alene River Subbasin) where groups of strategically located projects can collectively achieve better results than individual, isolated projects;
- identify and work with partners to determine where additional data are needed to help identify and prioritize projects, and work with others to acquire that information;
- enlist the help of community members, stakeholders, partners, agency technical experts, and others to develop restoration strategies specific to the focus area and major action; and
- develop a portfolio of prioritized restoration projects that collectively accomplish broad-scale major actions of the Restoration Plan.

5.3.2 Human Use Projects

To identify, prioritize, and plan Human Use Projects, the Trustees will work collaboratively with local Basin communities. The Trustees' collaborative efforts will include:

- informing communities of interest about Human Use Projects opportunities;
- working with communities to identify local values regarding natural resources projects;
- engaging local community members in planning and project development processes; and
- establishing collaborative working groups to address interim lost human uses of services provided by injured natural resources.

Once the Trustees select projects for funding, those projects will become part of the Trustees' annual operational plan.

5.4 Project Selection Criteria

Potential projects will be screened and ranked using the project selection criteria described in this section. These criteria are a tool the Trustees will use to assist decision making on how to best allocate limited funding to meet the purpose, need, goals, and objectives of the Restoration Plan in the face of opportunities that exceed the available funds. The criteria were developed using expertise from the Trustees as well as input received from the public. Selection criteria will

ensure that funded projects reflect the restoration approach and values described in preceding sections. The criteria act as a set of filters that disqualify projects ineligible for funding under the law or that only marginally advance restoration goals. Conversely, the criteria identify and advance projects that substantially and efficiently meet those goals.

Biological systems are complex and involve too many variables and contextual nuances to design a completely objective set of project selection criteria. Some criteria are inherently qualitative, and a collaborative approach of expert opinion will be used to evaluate proposals. The goal of ranking projects is not to assign an exact score, but to help designate a relative priority for each project. As a tool, the set of criteria facilitates decision making but does not provide final decisions. Since there is a broad array of variables, contexts, and imperfect information, the Trustees will need to rely on professional judgment when making funding decisions.

The Trustees will use the selection criteria outlined below to evaluate proposals and designate projects as low, medium, or high priorities. Final project selection will be a result of: 1) ranking under the relatively objective selection criteria described here; 2) review, combined professional judgment, and recommendation of technical staff; and 3) final review, approval, and authorization of funds obligated by the Trustee Council.

5.4.1 Eligibility Criteria

The eligibility criteria are a screening mechanism intended to determine whether project proposals are eligible for further evaluation and potential funding under this Restoration Plan. Projects must meet each of the following eligibility criteria in order to be considered and evaluated through a more detailed set of selection criteria:

- The project occurs within the Planning Area.
- The project restores, replaces, and/or acquires the equivalent of natural resources that were injured by the release of Mine Waste Contamination, or compensates for the interim loss of associated natural resource services.
- The project does not expend settlement funds on physical structures and infrastructure improvements such as buildings or traditional public works projects, except for those physical structures that are a necessary part of the restoration project (such as road work, sediment reduction, erosion control, or drainage features).
- The project will not result in additional injury to natural resources or services, including unmitigated short-term, long-term, and indirect impacts, or impede further restoration.
- Restoration will complement and not replicate cleanup, will not be undone, will not negatively impact future cleanup or interfere with current cleanup, and will not cause negative effects to cleanup already completed.
- Funds do not replace other obligated funds. The proposed project is not part of an independent, prior obligation resulting from a legal requirement such as a regulation, consent decree, or court order. Proposals that extend restoration benefits beyond legal obligations may be considered if the Trustee investment will substantially enhance injured natural resources.
- The project avoids or mitigates human health risks in contaminated environments.
- The project is consistent with applicable laws, regulations, and policy.

5.4.2 Project Selection Criteria

All eligible projects will be reviewed using selection criteria based on the Trustees' approach and values, goals and objectives of the Restoration Plan, and applicable regulations. The primary selection criteria are:

- ecological benefits;
- technical feasibility;
- cost-effectiveness;
- local economies and social values;
- Human Use Project considerations; and
- supplemental considerations.

Ecological Benefits – Projects must benefit injured natural resources and will be preferred when they:

- contribute to accomplishing one or more major actions identified in the Restoration Plan;
- occur in or target a geographic priority area identified in the Restoration Plan;
- provide measurable and significant benefits to injured resources, especially when they involve more than one habitat type or multiple injured resources;
- protect unique, rare, or significant habitats and/or native species, especially when the project areas is under imminent threats that would degrade or preclude future restoration;
- restore long-term processes that create and maintain habitat and are implemented at the appropriate scale and setting;
- provide benefits to injured resources within a strategic context on the landscape;
- integrate strategically with cleanup actions to provide additional benefits to injured resources;
- reduce fish and wildlife exposure to contaminants;
- minimize or mitigate the potential adverse effects of the project on natural resources;
- increase the rate at which ecological function is restored.

Technical Feasibility – Projects must be technically feasible and will be preferred when they:

- use proven, accepted strategies and techniques with a high likelihood of achieving objectives;
- have clearly identified and achievable needs for designs, permits, and administrative approvals, if applicable;
- have operations and maintenance plans clearly identified and developed and are appropriate for the project;
- have protection through conservation easements, public ownership or other mechanisms to ensure long-term success;
- have low or controllable risks from metals contamination or recontamination;
- have technical merit.

Cost-Effectiveness – Projects must have costs that are reasonable and proportional to the expected benefits. The Trustees consider environmental compliance costs as part of project implementation costs and, as such, will be factored as part of cost-effectiveness. Projects will be preferred when they:

- utilize cost-effective means including limiting overhead rates, indirect rates, costs associated with environmental compliance, and equipment costs;
- have expected costs that are reasonable and proportional to the expected benefits;
- minimize long-term operation and maintenance costs;
- provide additional cost-share funds (matching or scaled) from the project proponent and leverage Partnership funds.

Local Economies and Social Values – Projects will contribute to local economies and support community values, and are preferred when they:

- provide for human uses derived from natural resource restoration;
- provide local economic benefits;
- have broad community support;
- include education and outreach components that are effective, appropriate, and encourage long-term community support and stewardship of natural resources.

Human Use Project Considerations – Projects will compensate for the interim loss of the human uses of the physical and biological functions performed by injured natural resources, and are preferred when they:

- have a strong link to injured natural resources;
- will contribute to accomplishing one or more major actions identified in the Restoration Plan;
- reach diverse groups;
- are highly accessible;
- meet needs identified by community;
- have a measurable impact (e.g., intensity/frequency of use);
- are appropriate for the setting.

Supplemental Considerations – In addition to the above criteria, the Trustees will consider the following:

- **Demonstration and pilot projects:** Projects that are for demonstration purposes or propose innovative techniques may be desired and will be considered based on their technical feasibility, likelihood of success, public accessibility, and future application.
- **Integration with other plans:** Projects that are part of other relevant natural resource management plans developed with public input may be desirable when funding will speed the pace or enhance the magnitude of restoration.

- **Monitoring and special studies:** Projects will be preferred when they have included reasonable plans for implementation and effectiveness monitoring. When projects are special studies, the work must be relevant, needed, appropriately timed, and with strong technical merit. See also Sections 5.6 and 5.7.

5.5 Compliance and Permitting

Restoration projects implemented on public and private lands under this Restoration Plan will meet legal requirements. Some of the potential requirements are identified in this section; however, this includes requirements that may not apply to every project and the list is not all-inclusive. See Appendix 1 of the EIS for potentially applicable laws and regulations that govern the restoration projects authorized and implemented under this Plan. The Trustees will identify applicable requirements in the early stages of project design, and the project proponent will be responsible for documenting compliance with these requirements. There are Federal, State, Tribal, and local requirements that may apply. For example, many projects will require authorization from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.[16] Projects funded under this Plan must also comply with the federal Endangered Species Act of 1973, as amended[17] and may be required to undergo consultation with the U.S. Fish and Wildlife Service on potential effects to federally listed and proposed species and designated and proposed critical habitat. In addition, projects must comply with the National Historic Preservation Act, which may require consultation with state and tribal historic preservation offices if a project may impact historic or archaeological resources.

Projects will be required to comply with the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts. The appropriate level of analysis and NEPA report will be identified based on each project's scope and potential level of impact. NEPA compliance for individual restoration projects will be accomplished through tiered environmental assessments or other project-specific NEPA analyses. The Environmental Impact Statement (EIS) for this Coeur d'Alene Basin Restoration Plan is being prepared for the broad federal action of adopting the Restoration Plan, which authorizes the release of settlement funds for restoration projects.

The EIS purpose is to expedite and provide a framework for environmental analysis of future site-specific projects. As projects are selected, subsequent project-specific NEPA analyses will be prepared as necessary. Other projects may have site-specific NEPA analyses completed prior to proposal submittal. For projects requiring site-specific NEPA analyses, potential reporting mechanisms include EISs, supplemental EISs, environmental assessments with findings of no significant impacts, determinations of NEPA adequacy, and categorical exclusions. Using the concepts developed in this Restoration Plan and the associated EIS, future environmental review of the Coeur d'Alene Basin Restoration Plan and EIS will focus on site-specific issues and impacts and will incorporate by reference the relevant aspects of the EIS.

5.6 Supplemental Monitoring and Investigation

Given the complexity of natural resources and their interactions in the Basin, there will likely be information needed that will not be captured by simply monitoring the implementation and effectiveness of each project. Information needs may include broader-scale questions than can be captured at the project scale, or monitoring at a finer scale than would normally be done if it can guide future restoration techniques, project types, and science. Supplemental investigations may also include consolidation and interpretation of Basin-scale data or contributions to others'

[16] 33 U.S.C. 1344
[17] 16 U.S.C. 1531 *et. seq.*

efforts in examining Basin-wide trends. Information obtained from supplemental studies may be needed to further plan or prioritize restoration, or to prioritize from within an array of projects in order to best allocate resources.

The following criteria would be used to evaluate proposals that consist solely of studies or monitoring programs that support restoration as opposed to the design and implementation of on-the-ground restoration projects. **Note: These general criteria will also be used to evaluate project-level monitoring when monitoring is included in restoration project proposals.**

Table 8. Supplemental monitoring criteria and guidelines

Criteria	Guidelines
Relevance	Monitoring projects or studies are relevant when: • the study purpose and question relate to the injury. • the information gathered directly advances identification, prioritization, and likelihood of success of restoration.
Need	Monitoring projects or studies are needed when they provide information: • that is unavailable elsewhere, is not being collected by another entity, or is the responsibility of another entity. • that is needed for strategic planning and prioritization.
Timing	Monitoring projects or studies are timely when they: • describe site conditions that need to be known in order to plan/prioritize restoration. • help prioritize an array of restoration projects to better strategize and allocate resources. • provide specific information needed for adaptive management.
Technical Merit	A study or monitoring plan has technical merit when: • the study design and methodology are appropriate to answer the question being considered (e.g., sampling strategy, sensitivity, frequency, management of variability). • the study question is asked at the proper spatial or temporal scale.
Integration	Studies or monitoring efforts will be preferred when they can be combined with complementary efforts for improved efficiency and understanding.
Cost-Effective	Proposed studies or monitoring programs are cost-effective when: • the study design effectively yields useful information while minimizing cost. • the proposal leverages additional funding or provides partner matches. • the proposal minimizes overhead or the acquisition of equipment.

5.7 Measuring Success

Monitoring will be used to determine success of projects. Monitoring may be required to determine if projects meet their objectives, what methods are the most effective, and if restoration is moving conditions closer to those desired. Potential projects under this Plan are intended to improve conditions for species across the Basin; however, monitoring trends at the landscape scale is beyond the capabilities of the Trustees alone.

Project-scale monitoring conducted under this Plan is intended to combine with data collected throughout the Basin by others to address conditions and trends at the landscape scale.

Project-level monitoring focuses on questions and objectives that can be reliably answered. Beyond the project scale, determining significance at the landscape level may be impossible. The following are important considerations for project-level monitoring:

- **Scale appropriate:** extent and intensity of monitoring should be commensurate with the expected scale of effects.
- **Targeted:** monitoring should be well defined, focused on the most important questions that need to be answered, and tailored specifically to answer those questions.
- **Non-duplicative:** to make the most efficient use of time and resources, monitoring should not duplicate ongoing efforts of other organizations. In some cases, existing monitoring efforts can be extended or supplemented by the Trustees to make efficient use of existing resources.

5.7.1 Proposed Monitoring

Monitoring is done at different scales and is used to answer a variety of questions. Under this Plan, monitoring will be used to determine if projects are completed according to plans and proposals, are effective at achieving their objectives, and contribute to Basin-wide trends of injured natural resources.

5.7.2 Implementation Monitoring

Implementation monitoring is intended to determine whether projects were conducted according to stated project proposals, designs, and permits. Monitoring will be conducted through collaboration with the Trustees and project proponents. Information gathered with implementation monitoring will be used for programmatic and financial accountability, as well as design compliance.

5.7.3 Effectiveness Monitoring

Effectiveness monitoring determines whether a project, as designed and implemented, accomplished identified objectives and advanced conditions towards a larger goal. Effectiveness monitoring is an important component of adaptive restoration because it provides information on what restoration techniques are working and how they can be adjusted to better meet objectives. Monitoring conducted before projects are done is also important, and the Trustees will take advantage of many monitoring efforts (such as EPA's monitoring program, Idaho Department of Fish and Game and Tribal fish population surveys, spawning surveys, waterfowl banding) throughout the Basin to characterize projects before they are implemented. This information may be needed for project planning and to evaluate the effects of completed projects.

Specific effectiveness monitoring plans or requirements cannot be determined now, due to the expected diversity and distribution of future projects. Also, the scale and intensity of effectiveness monitoring will vary and be commensurate with the expected scale of effects. For example, projects that use unique techniques or demonstration projects may be monitored more intensively in order to provide information for adaptive management. Projects repeatedly employing commonly used techniques in areas of similar geography may be monitored less intensively. These determinations will be made on a case-by-case basis.

The project submission process may require inclusion of a monitoring plan, including specific monitoring questions and a description of methods designed to answer those questions. The final plan will be the result of collaboration between project applicants, cooperators, and the Trustees.

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7. Definitions

abiotic: Non-living chemical and physical factors in the environment that affect ecosystems.

acquisition of the equivalent or replacement: The substitution for an injured resource with a resource that provides the same or substantially similar services.

adfluvial: Migratory between lakes and rivers or streams.

baseline: The condition or conditions that would have existed at the assessment area had the release of the hazardous substance under investigation not occurred.

Basin: The Coeur d'Alene Lake watershed and Upper Spokane River Subbasin in Idaho.

benthic flux: The transport of dissolved chemicals across the solid-liquid interface at the bottom of aquatic systems. The flux of solutes can be either positive (into the water column from the sediment) or negative (out of the water column into the sediment) and can vary over multiple temporal and spatial scales. Benthic flux of zinc, cadmium, arsenic, and mercury into the water column can impact lake system food webs.

benthic macroinvertebrates: Small animals living among stones, logs, sediments, and aquatic plants on the bottom of streams, rivers, and lakes. They are large enough to see with the naked eye (macro) and have no backbone (invertebrate).

biotic: A living or once living component of a community such as plants and animals.

blasting: Although uncommon, blasting can create small, shallow water wetlands without the need for large equipment.

Coeur d'Alene Basin: See "Basin" definition.

deformable banks: In channel restoration design, a deformable channel bank is one which allows for maintenance of channel stability through gradual planform change via lateral bank migration. Deformable channel banks are considered wherever geomorphic integrity and floodplain function are required as objectives of natural channel restoration.

dikes: Constructed to manage water levels in wetland restorations. Typically, they are no more than five feet high, and are used to restrict areas where shallow water is desired.

easement: A tool to protect properties, but maintain current ownership. If an easement on a property is purchased, the landowner maintains ownership but loses development rights.

ecosystem processes: The complex physical, chemical, and biological interactions within an ecosystem such as natural disturbance, hydrology, nutrient cycling, biotic interactions, population dynamics, and evolution. These processes determine the species composition, habitat structure, and ecological health of sites and landscapes. Reference: http://www.epa.gov/oecaerth/resources/policies/nepa/ecological-processes-eia-pg.pdf

emergent plants: Plants that have a large portion of their shoots, leaves, or flowering structures out of the water.

eutrophication: The natural processes by which lakes and ponds become enriched with dissolved nutrients and sediments, resulting in increased growth of algae and rooted aquatic plants and reduced water clarity. Anthropogenic eutrophication is a term for the acceleration of the eutrophication process caused by humans' land use activities.

extirpated: In this Plan, extirpated means to destroy, eliminate, or suppress natural resources as a result of Mine Waste Contamination.

fencing: Barriers used to prevent livestock from using wetlands and to make restoration possible.

floodplain: An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.

fluvial: Refers to processes associated with rivers and streams. Fluvial also describes the life history of fish species that spend most of their adult lives in larger streams and rivers and spawn and rear in tributary streams.

focal resources: In this Plan, the focal resources refer to native fish and waterfowl.

focal species: Species that receive management emphasis because their abundance or distribution is indicative of essential habitat conditions. Focal species may include "indicator species" which can be defined as those that tell something about the conditions in a particular habitat.

food web: A series of organisms related by predator-prey and consumer-resource interactions; the entirety of interrelated food chains in an ecological community.

habitat-forming processes: These are ecosystem processes (see definition above) that determine the composition, structure, and function of habitats for fish and wildlife. Examples include flooding, sediment transport and deposition, and large wood recruitment to streams.

Hangman Creek Watershed: The area that drains into the mainstem of Hangman Creek and its tributaries located within the exterior boundary of the Coeur d'Alene Reservation.

hardening: Placement of erosion resistant materials on shorelines and riverbanks, including rock (rip-rap), timbered crib walls, or metal bulkheads.

Human Use Projects: Those projects or project components designed to compensate for the interim loss of the human uses of the physical and biological functions performed by natural resources injured by Mine Waste Contamination.

hydric: Refers to ecosystem components containing high amounts of moisture. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Reference: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/hydric/?cid=nrcs142p2_053961

invasive species: A species that is not native to a specific location (an introduced species), and which has a tendency to spread to a degree believed to cause damage to the environment, human economy, or human health.

island construction: Constructed land areas in wetlands that can add topographical diversity and provide drier areas for waterfowl loafing.

littoral: The zone along a lake shore extending from ordinary high water to the limits of submerged rooted vegetation. Often these areas are where biological productivity is greatest and humans have maximum impact.

Mine Waste Contamination: Contamination from the release of mining-related hazardous substances in the Basin.

natural resources: Land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by one or more of the Trustees.

nest boxes: Constructed boxes that provide places for mallards, geese, and wood ducks to nest where nesting habitat is limited. Although not a primary focus of restoration, nest boxes can increase bird use in restored wetlands and are inexpensive to install and maintain.

noxious weeds: Nonnative, invasive plants that out-compete native vegetation. Within the Coeur d'Alene Basin area noxious weeds include reed canarygrass and Eurasian watermilfoil. Both need to be controlled for restoration to be successful. There are a variety of chemical, physical, and biological techniques used to control invasive species, and all will be considered depending on site-specific conditions.

nutrient loads: The addition of nutrients, usually nitrogen or phosphorus, to a water body (often expressed in amount of weight per unit of time). The majority of nutrient loading in a lake usually comes from its tributaries.

Operable Units (OUs): A regulatory term meaning each portion of a Superfund site where cleanup activities occur and each OU is investigated and cleaned up separately from other portions of the site.

phytoplankton: Microscopic organisms that live in watery environments, both salty and fresh. Some phytoplankton are bacteria, some are single-celled organisms (like amoebas), and most are single-celled plants.

phytotoxic: Poisonous to plants.

pollutant: A substance or energy introduced into the environment that has undesired effects, or adversely affects the usefulness of a resource. A pollutant may cause long- or short-term damage by changing the growth rate of plant or animal species, or by interfering with human amenities, comfort, health, or property values

plug ditches: A cost-effective way to return surface water levels to where they were before ditches were dug.

point-source pollutants: Pollutants discharged from any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, sewer, tunnel, conduit, or well.

recovery: The desired result of ecological restoration that initiates or accelerates the return of an ecosystem and the biotic populations that depend on that ecosystem to health, integrity, and sustainability. In the context of CERCLA, recovery is the return of baseline conditions.

refugia: Distinct geographic areas or habitats organisms retreat to, persist in, and potentially expand from under changing environmental conditions or disturbance.

rehabilitation or restoration: Actions undertaken to return an injured resource toward its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided.

remediation: The cleanup of hazardous wastes through removal, containment, and other methods to protect human health and the environment.

replacement or acquisition of the equivalent: The substitution for an injured resource with a resource that provides the same or substantially similar services.

restoration or rehabilitation: Actions undertaken to return an injured resource toward its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided.

riparian zone: An area of interaction between an aquatic and an upland area. Extent of riparian zones is dependent on duration and extent moisture regime (e.g., influence of the aquatic habitat) and height of a site potential tree or other vegetation (e.g., furthest point from the waterbody from which nearby vegetation may directly influence that water body).

riparian habitat: Riparian habitat is a key component of wetlands, lakes, and streams and occurs as a transitional area between aquatic and upland ecosystems; it includes all land directly affected by surface water. Riparian habitats influence aquatic systems by controlling erosion and sedimentation, moderating water temperature, providing woody debris structure, and maintaining invertebrate communities that contribute to food chains in aquatic systems.

salmonid: Belonging or pertaining to the family Salmonidae, including the salmons, trout, chars, and whitefishes.

sense of place: Inhabitants of an area develop a “sense of place” through experience and knowledge of a particular area. A sense of place emerges through knowledge of the history, geography, and geology of an area, its flora and fauna, the legends of a place, and a growing sense of the land and its history after living there for a time. Through time, shared experiences and history help connect place and people and to transmit feelings of place from generation to generation.

services (natural resource services): The physical and biological functions performed by the resource including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource.

sinuosity: The tendency of a river or stream to move back and forth across its floodplain, in an S-shaped pattern over time.

streambank bioengineering: A suite of restoration techniques that combine plants and other protective organic materials to increase the strength of riverbank soils to resist erosion and to restore habitats and ecological processes associated with natural riverbank vegetative communities.

strongholds: Streams, watersheds, or other spatial units where biotic populations are strong and diverse, and the habitat has high intrinsic potential to support a particular species or suite of species.

submergent plants: Plants that have most of their plant structures below water.

subsistence practices: Uses of wild resources are defined as 'noncommercial, customary and traditional uses' for a variety of purposes. These include: direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible by-products of fish and wildlife resources taken for personal or family consumption; and for the customary trade, barter, or sharing for personal or family consumption.

trophic cascade: This term refers to the aquatic food web predator-to-prey relationship.

trustee or natural resource trustee: Any Federal natural resources management agency designated in the NCP and any State agency designated by the Governor of each State, pursuant to Section 107(f)(2)(B) of CERCLA, that may prosecute claims for damages under Section 107(f) or 111(b) of CERCLA; or an Indian tribe, that may commence an action under Section 126(d) of CERCLA.

Trustees: The Coeur d'Alene Basin natural resource trustees, comprised of the Coeur d'Alene Tribe (Tribe); the State of Idaho (State), represented by the Idaho Department of Fish and Game and the Idaho Department of Environmental Quality; the U.S. Department of Agriculture (USDA), represented by the U.S. Forest Service; and the U.S. Department of the Interior (DOI), represented by the Bureau of Land Management (BLM) and the U.S. Fish and Wildlife Service (USFWS).

water control structures: Installed in dikes or berms and give managers the ability to directly manipulated water levels. They have a system of boards that can be removed to lower water levels, or put back in to raise water levels.

watershed: An area or ridge of land that separates waters flowing to different rivers, basins, or seas.

zooplankton: Small floating aquatic animals that drift with water currents and are a key food source for fish and other aquatic organisms.

8. Signature Page

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LEANNE M. MARTEN
Regional Forester, Northern Region
United States Department of Agriculture, Forest Service

_____

ROBYN THORSON
Regional Director, Region 1
United States Department of the Interior, Fish and Wildlife Service

_____

CHIEF J. ALLAN
Chairman
Coeur d'Alene Tribal Council

_____

JOHN H. TIPPETS
Director, Idaho Department of Environmental Quality
State of Idaho

_____

VIRGIL MOORE
Director, Idaho Department of Fish and Game
State of Idaho