Coeur d'Alene Tribe
Integrated Resource Management Plan

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chstqhessiple'
hnkhwlkhwlstsutnet

The future course
of our renewal

Coeur d'Alene Tribe
Natural Resource Department
850 A Street
P.O. Box 408
Plummer, Idaho 83851
February 2012

Cover photos: *(top)* Historic Photo #1857: Men on horses in DeSmet *(Coeur d'Alene Tribe/Courtesy of Fr. Thomas Connelly, S.J.); (bottom)* Plummer Butte *(Courtesy of Alison Meyer)*

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"The future course of our renewal"

February 2012

Coeur d'Alene Tribe

Chief J. Allan
Chairman

Bureau of Indian Affairs

Stan Speaks
Regional Director
Northwest Region

NATURAL RESOURCE DEPARTMENT
ENVIRONMENTAL PROGRAMS OFFICE
APPROVE COEUR D'ALENE TRIBE
INTEGRATED RESOURCE MANAGEMENT PLAN **CDA RESOLUTION 18 (2012)**

WHEREAS, the Coeur d'Alene Tribal Council has been empowered to act for and on behalf of the Coeur d'Alene Tribe pursuant to the revised Constitution and Bylaws, adopted by the Coeur d'Alene Tribe by referendum November 10, 1984, and approved by the Secretary of the Interior, Bureau of Indian Affairs, December 21, 1984; and

WHEREAS, the Coeur d'Alene Tribal Council has a responsibility for the Health, Welfare, and Economic Development of the Tribe and its members; and

WHEREAS, the Coeur d'Alene Tribal Council supports the development of an Integrated Resource Management Plan (IRMP) to manage the future of Tribal environmental, natural and cultural resources (as they relate to the environment); and

WHEREAS, the Coeur d'Alene Tribal Council approved the IRMP Interdisciplinary Team (IDT) composed of representatives from Tribal departments, programs and committees to provide advice on the development of the IRMP; and

WHEREAS, the Coeur d'Alene Tribal Council also approved an IRMP Community Advisory Committee (CAC) composed of members of the public to provide advice on the development of the IRMP; and

WHEREAS, the general public and the IRMP CAC reviewed and had an opportunity to comment on the IRMP Final Programmatic Environmental Impact Statement (FPEIS) [Tribal Council Resolution #274(2007)]; and

WHEREAS, the general public and the IRMP CAC reviewed and had an opportunity to comment on the IRMP Record of Decision (ROD) [Tribal Council Resolution #72(2008)]; and

WHEREAS, the IRMP IDT has prepared, reviewed and commented on the IRMP; and

NOW, THEREFORE, BE IT RESOLVED, That the Coeur d'Alene Tribal Council approves the Coeur d'Alene Tribe's Integrated Resource Management Plan; and

BE IT FURTHER RESOLVED, That the Tribal Council approves submitting the IRMP to the U.S. Bureau of Indian Affairs for approval and signature; and

BE IT FURTHER RESOLVED, That the Tribal Council approves the IRMP to be published and distributed to the general public; and

BE IT FURTHER RESOLVED, That the Environmental Programs Office in the Natural Resource Department, with assistance from appropriate Tribal programs and departments, will develop an annual report for the Natural Resource Director to submit to the Tribal Council documenting progress toward the goals listed in the IRMP; and

BE IT FINALLY RESOLVED, That the Coeur d'Alene Tribal Chairman or his designee is authorized to sign the Integrated Resource Management Plan and all documents related to this project on behalf of the Coeur d'Alene Tribe.

CERTIFICATION

The foregoing resolution was adopted at a meeting of the Coeur d'Alene Tribal Council held at the Coeur d'Alene Tribe Casino, Resort Hotel, Worley, Idaho, on November 17, 2011, with the required quorum present by a vote of 6 FOR 0 AGAINST

Chief J Allan

CHIEF J. ALLAN, CHAIRMAN
COEUR D'ALENE TRIBAL COUNCIL

NORMA JEAN LOUIE, SECRETARY
COEUR D'ALENE TRIBAL COUNCIL

k'wne' chstqhessiple' hnkhwlkhwlstsutnet
"The Future Course of Our Renewal"
Integrated Resource Management Plan

is Dedicated To

Tribal Elder Felix Aripa

and
Honorable Richard Mullen (in passing)

For all of the wisdom, history, culture, traditional and contemporary knowledge, laughter, time and patience Felix and Richard brought to the development of the IRMP, without which the IRMP may never have been completed.

The Tribal Natural Resource Department would like to extend a special *lim lemt.sh* to Coeur d'Alene Tribal Councils, past and present, for the many years of support in the development of the Tribe's Integrated Resource Management Plan.

The Coeur d'Alene Tribe would like to say *lim lemt.sh* to all of the people that participated in the development of this *stqhesiple'* Integrated Resource Management Plan. Hundreds of people, Tribal and non-Tribal, provided input into this management plan for the future of the Coeur d'Alene Reservation and the Tribe's Aboriginal Territory. Many of the contributors' names can be found in the IRMP Final Programmatic Environmental Impact Statement. To those that were not named in that document or previous documents, please know that your contribution made a difference to the Tribe and IRMP.

The Coeur d'Alene Tribe would also like to acknowledge the financial and technical support of the U.S. Environmental Protection Agency, the U.S. Department of the Interior Bureau of Indian Affairs and early funding contributions from the Administration for Native Americans in the U.S. Department of Health and Human Services.

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Felix Aripa sharing cultural stories with young people (photo by Angelo Vitale).

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hnchch'li', "Where there are little muskrats (photo by John Hartman).

Chapter One:

Introduction

The old ones walked here. Those yet unborn will walk here too. From a tribal perspective, the Coeur d'Alene presence here on the Reservation and within the ancient homeland has lasted since the beginning of time. Every Tribal member knows and feels the links to generations past. The culture and traditions have developed and been passed on for thousands of years – in the same place. In modern Indians, you see the faces of their ancestors (Coeur d'Alene Tribe 2011a).

Fourth of July Pow-Wow 1922 (photo by J.F. Anderson).

Background

We are Coeur d'Alenes, *Schitsu'umsh*, "the ones that were found here", and we have been placed here by the Creator in what is now known as the Panhandle of Idaho. Our territory once extended from Lake Pend Oreille in the north to the Bitterroot Range of Montana in the east to the Palouse and North Fork of the Clearwater Rivers in the south to Steptoe Butte and up to just east of Spokane Falls in the west. The Coeur d'Alene Tribe exercised inherent power deriving from our sovereign status, long before the advent of European discovery of the Americas. The Tribe has always possessed inherent sovereign authority to govern ourselves and determine our own destiny.

In 1873, the Tribe gave up claims to more than three million acres of our aboriginal territory and the Tribe's first reservation was established by Executive Order of President Ulysses S. Grant. The 1873 executive order and subsequent agreements with the United States for further cessation of Tribal Territory in 1887, 1889 and 1894, all recognized the Tribe's inherent sovereign authority. In 1947 the Tribe adopted our constitution, pursuant to the Indian Reorganization Act of 1934, and since that time has functioned under a governmental system responsible for health, welfare and safety of our members and for the protection of Tribal assets and natural resources. The Tribe is a federally recognized Indian Tribe and continues to exercise inherent sovereign authority, altered only by our government-to-government relationship with the United States (Appendix A contains a brief history of the Coeur d'Alene Tribe).

The Coeur d'Alene Tribe (Tribe) has established governmental functions to protect the cultural and environmental values of the Coeur d'Alene Tribe. Specifically, the mission statement of the Tribe's Natural Resource Department is to preserve, protect, enhance and manage the natural resources, improve the quality of life, and to provide social and economic benefits across the Reservation and the Tribe's aboriginal territory.

Environmental Action Plan (EAP) Project
The Coeur d'Alene Tribe's Environmental Action Plan (EAP) Project was initiated in 1997 to coordinate the identification, assessment and management of environmental concerns on and near the Coeur d'Alene Reservation. There are three phases of the EAP Project:

- Phase I: Assessment of Environmental Concerns—completed (Appendix B contains the final Risk Ranking of the list of environmental concerns)
- Phase II: Development of an Environmental Management Plan (IRMP) — completed
- Phase III: Implementation of the Environmental Management Plan – ongoing

This IRMP is the completion of Phase II of the EAP Project. The common goals for the EAP Project and the IRMP are to:

- Improve local environmental conditions to benefit human health, ecology and quality of life
- Involve the public throughout the development of the plan
- Provide tools for Tribal and community environmental planning and action, as well as to other programs and planning activities
- Increase communication and cooperation to improve environmental management with Tribal community and departments, and local, state, and federal governments

What is the Coeur d'Alene Tribe's *stqhesiple'* Integrated Resource Management Plan (IRMP)?

The Coeur d'Alene Reservation and the Tribe's aboriginal territory have a rich assembly of natural, cultural and environmental resources. The Reservation and surrounding lands support a diversity of vegetation for agriculture, forestry, wildlife, riparian habitat, and wetland complexes. The Coeur d'Alene Reservation was reserved out of the Tribe's aboriginal territory to serve the social, economic and environmental needs of the Coeur d'Alene Tribe. A management plan is needed to ensure that Tribal resources are protected and balanced with an increasing demand for development. An

Integrated Resource Management Plan will also assist in the development or updating of other plans, codes, or ordinances that affect the Reservation.

The Integrated Resource Management Plan ("IRMP") addresses the natural resources and environmental issues that were identified in the Coeur d'Alene Tribe's *Environmental Action Plan ("EAP") Assessment of Environmental Concerns on and near the Coeur d'Alene Reservation* report. The IRMP is expected to guide management of Tribal natural, environmental and cultural resources for the next 20 years by providing programmatic level recommendations for land use, natural resource enhancement and protection, residential/commercial growth and development planning, and cultural preservation for the Coeur d'Alene Reservation and natural, cultural and environmental resource management recommendations for the Tribe's aboriginal territory.

Purpose of the IRMP

This IRMP provides management guidance for the Coeur d'Alene Tribe's natural, environmental and cultural resources. The IRMP focuses on the Coeur d'Alene Reservation, which is 334,471 acres, not including Tribal submerged lands (Figure 1.0, Coeur d'Alene Reservation Map). Land use recommendations, 100-year Desired Future Conditions and individual resource 20-year goals for the Reservation are contained in the IRMP. To a lesser extent, the IRMP focuses on the Tribe's aboriginal territory by outlining broad 100-year Desired Future Conditions for landscape and cultural resources. The Tribe's aboriginal territory is over 5 million acres (Figure 1.1, Aboriginal Territory Site Location Map).

The IRMP, in conjunction with the Coeur d'Alene Tribal Comprehensive Plan (in draft) and related plans, will be used to recommend land use on the Reservation for the next 20 to 100 years in a way that meets both public use and resource management needs.

Figure 1.0 Coeur d'Alene Reservation.

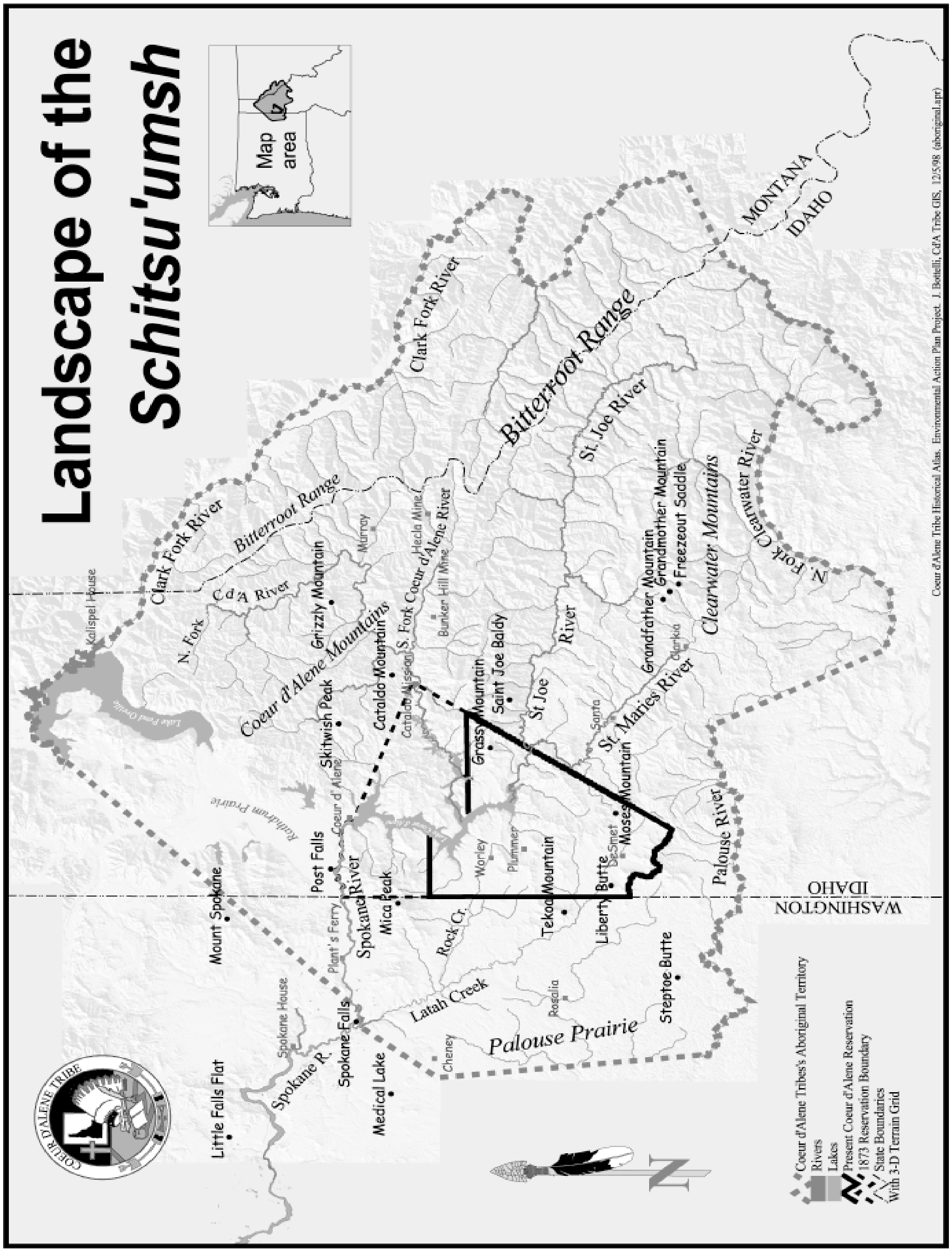


Figure1.1 Aboriginal Territory of the Coeur d'Alene Tribe.

This IRMP, adopted by the Coeur d'Alene Tribal Council, addresses the resource issues, concerns, and goals identified by the public, and provides the critical guidance needed to more efficiently and effectively manage the unique and diverse resources found within the Coeur d'Alene Reservation and the Tribe's aboriginal territory.

The specific goals for the IRMP are to:

- Preserve, protect, and enhance natural, cultural and environmental resources across the Reservation and aboriginal territory:
- To the extent possible, restore natural, cultural and environmental resources across the Reservation and aboriginal territory
- Emphasize the history and culture of the Coeur d'Alene Tribe
- Work cooperatively to improve the quality of life, providing direct social and economic benefits for the Tribe

Implementation of the IRMP will facilitate coordination among Tribal Council, agencies, public, and other jurisdictional entities to meet identified goals and objectives on the Reservation and across the landscape.

The overall Desired Future Conditions for the IRMP are:

- To maintain the rural character of the Reservation,
- Restore and maintain as much of the Reservation ecology and biodiversity as possible in order to provide for Tribal subsistence and cultural uses of the resources,
- Assist with effective land use planning and resource management through cooperative efforts, and
- Work to achieve the Desired Future Conditions included in the IRMP for the Tribe's aboriginal territory.

The IRMP does not address the impact of historic mining and/or milling activities on or near the Coeur d'Alene Reservation or the Coeur d'Alene River. The Natural Resource Damage Assessment, the Coeur d'Alene Basin Remedial Investigation/Feasibility Study (RI/FS) and the Coeur d'Alene Lake Management Plan are addressing mining- and/or milling-related resource impacts independent of the EAP Assessment and IRMP.

IRMP Planning Period

The planning period for the IRMP consists of a 100-year planning horizon for the IRMP's Desired Future Conditions and a 20-year planning period for the Reservation's natural and human environment goals. In 20 years, the Tribe will conduct a thorough update of the IRMP. Until then, the implementation, monitoring and amendment process described in Chapter 6 of the IRMP will be used to keep the plan current.

How the IRMP Was Developed

This is the first comprehensive natural resource management plan that the Coeur d'Alene Tribe has completed for the Reservation and the Tribe's aboriginal territory. This effort has taken many years and many people have given their time and input into the process. For a more detailed discussion of public involvement in the IRMP process, please read Chapter 6 and Appendix C of the IRMP Final Programmatic Environmental Impact Statement available from the Coeur d'Alene Tribe's Natural Resource Department.

The main steps used to develop the IRMP are as follows:

- Develop and complete the *Environmental Action Plan (EAP) Assessment of Environmental Concerns on and near the Coeur d'Alene Reservation* report (1997-2000)
- Begin the IRMP process and conduct pre-planning activities (2000)
- Assemble the IRMP Interdisciplinary Team (IDT), an internal Tribal staff team to guide the development of the IRMP (2000)
- Assemble the IRMP Community Advisory Committee, an advisory committee open to anyone in the general public, agencies, other governments, businesses, etc. (2000)
- Initiate the National Environmental Policy Act (NEPA) process with a Notice of Intent and Public Scoping (2000-2002)
- Develop the IRMP Draft Programmatic Environmental Impact Statement (2002-2005)
- Publish and distribute the IRMP Draft Programmatic Environmental Impact Statement for public comment (2005)

- Develop, publish and distribute the IRMP *Final* Programmatic Environmental Impact Statement (2005-2007)
- Develop, publish and distribute the IRMP Record of Decision (2007-2008)
- Write, publish and distribute the IRMP (2008-2012)

Consistency with Other Plans

The Coeur d’Alene Tribe has several plans in progress or approved by the Tribal Council that the IRMP is designed to be consistent with:

- Tribal Housing Authority Plan
- Tribal Transportation Plan
- Tribal Comprehensive Economic Development Strategy
- Tribal Forest Management Plan
- Tribal Fire Management Plan
- Tribal Environmental Health Plan
- Coeur d’Alene Tribal Comprehensive Plan (in draft)
- Coeur d’Alene Tribal Land Use Plan (in draft)
- Coeur d’Alene Tribal Community Development Plans (in draft)
- Coeur d’Alene Lake Management Plan

In addition, the IRMP is designed to be an umbrella plan for other plans to “tier” to, such as the Tribe’s Forest Management Plan and any future Tribal Agricultural Management Plan(s).

Chatcolet Lake (photo by Perry Kitt).

Chapter Two:

100-Year Desired Future Conditions for the Coeur d'Alene Tribe's Aboriginal Territory

Introduction

The Coeur d'Alene Tribe's 100-year Desired Future Conditions were developed to provide an overall framework for the Tribe's management direction as it relates to the Coeur d'Alene Reservation as well as the Tribe's aboriginal territory. Two resource categories were developed to encompass everything in the Tribe's aboriginal territory: Landscape and Culture. Landscape contains all natural and human resources; basically everything in the landscape of the *schitsu'umsh* (Coeur d'Alene Tribe). Culture refers primarily to Tribal culture but is not meant to exclude other cultures.

100-year Desired Future Conditions

Landscape (Aboriginal Territory and Reservation)

The 100-year DFCs for the Coeur d'Alene Tribe's aboriginal territory and Reservation are to restore and maintain native biological diversity throughout the landscape.

- Increase Tribal involvement on all land use changes and development projects in the aboriginal territory and on the Reservation.
- Increase Tribal staffing to consult on proposed developments throughout the aboriginal territory and on the Reservation.
- Work with other entities to establish biodiversity corridors through already-developed areas that are linked with adjacent natural areas.

Tipi Frames (photo from the Father Connelly Collection).

Culture (Aboriginal Territory and Reservation)

The 100-year DFCs for the cultural resource category are for the Tribe to protect existing cultural resources and continue to conduct hunting, gathering, fishing, and cultural activities throughout the aboriginal territory and Reservation.

- Preserve, protect, manage, and enhance Tribal culture.
- Aggressively work with private, local, and federal entities to protect and manage cultural resources and sites. Increase awareness regarding the significance of these resources.
- Provide for education of traditional practices and Tribal history to non-native people.
- Protect sacred and culturally significant sites and properties through the *hndesnet* Tribal Culture Department.
- Build a Tribal Interpretive Center.

Confirmation Preparation at a Youth Tipi Camp in 1986 (photo from Father Connelly's Collection).

Pond construction on the Coeur d'Alene Reservation (photo by Angelo Vitale).

Chapter Three:

Land Use Recommendations for the Coeur d'Alene Reservation

The cultural land use of the Coeur d'Alene Tribe and input from all Reservation residents were used to create the IRMP's land use recommendations. The Coeur d'Alene Tribe considered the Reservation as a whole when developing recommendations for future land use on the Reservation.

Land Use is defined as the function to which land is put or is classified for future uses; that is, for housing, agriculture, commercial, industrial, etc.

The definition comes from a book titled, *Holding Our Ground: Protecting America's Farms and Farmland* by Tom Daniels and Deborah Bowers, published in 1997 by Island Press.

To assist the Tribe in addressing the future of the environment, the Tribe created the following overall 100-year Desired Future Conditions and 20-year goals for land use on the Reservation:

Land Use 100-Year Desired Future Conditions and 20-Year Goals

1. Restore and maintain Tribal cultural land use for subsistence activities as desired.
2. Maintain the rural character of the Reservation in all LMRs except for areas designated for development (as shown in Land Management Recommendation Area 1).
3. Encourage maintenance of existing farmland and forestland.
4. Encourage maintenance and restoration of wetlands, riparian areas, streams and forestland.
5. Discourage subdivision of property in all LMRs except for areas designated for development (as shown in Land Management Recommendation Area 1).
6. Develop a Land Use Plan for the Reservation, including a Shoreline Management Plan.
7. Develop open space plans for Reservation watersheds.
8. Utilize principles of conservation zoning to require conservation of open space identified in the plans when property is developed (Arendt 1999).

As a step in the process of developing a future land use map for the Reservation, the Tribe first developed a map of the main sub-watersheds on the Reservation:

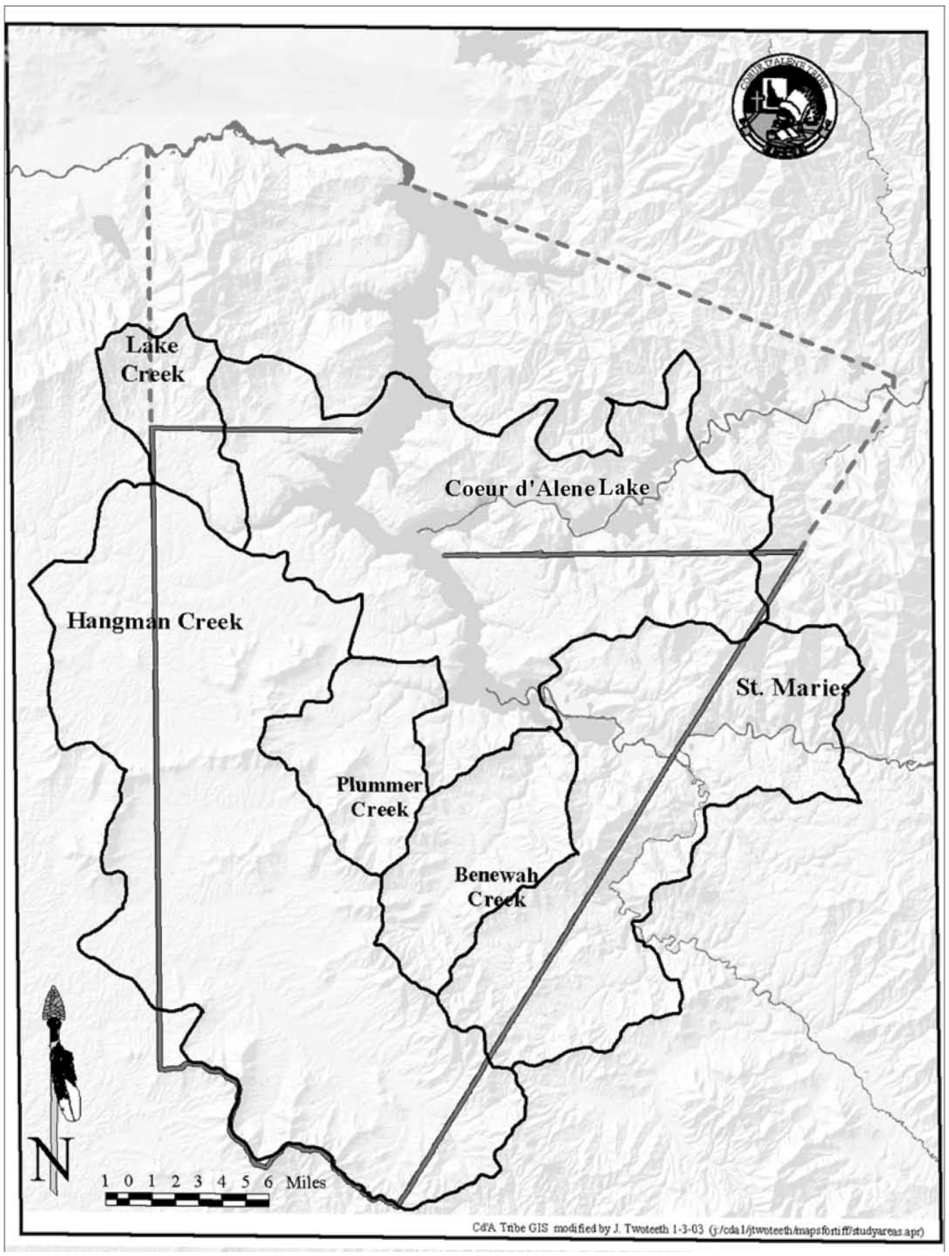


Figure 3.1 Land Management Areas (LMRs).

Then the Tribe developed a map that shows the general recommendations for future land use on the Reservation using a color-coded system. Each color corresponds to a Land Management Recommendation (LMR) type (note: The LMRs do not always directly correspond to watershed boundaries):

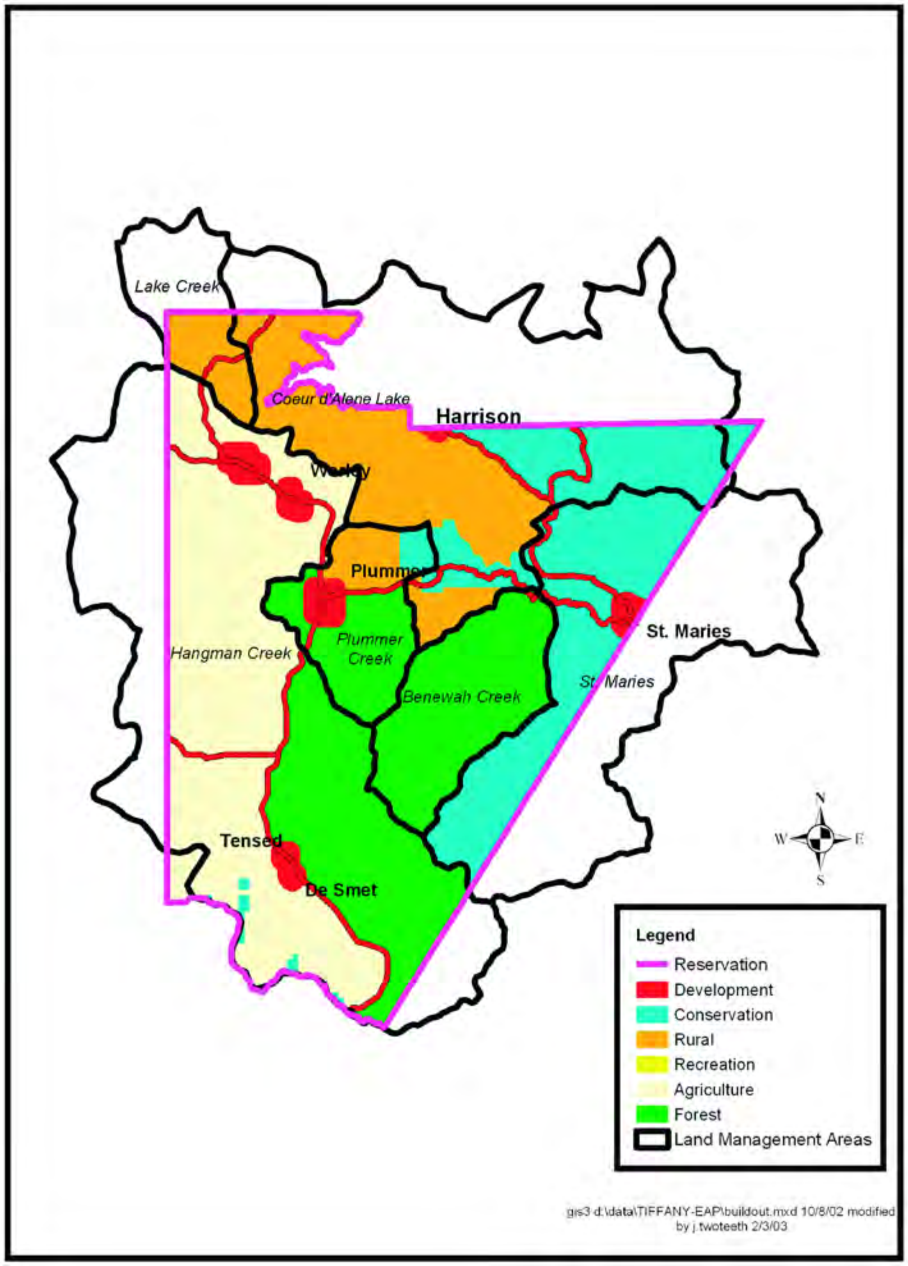


Figure 3.2 Coeur d'Alene Reservation Land Management Recommendations (LMRs).

The table below summarizes the approximate number of acres that are shown in each of the Land Management Recommendation Areas by watershed.

Table 3.1 Land Management Recommendations by Watershed (in Acres)

Watersheds	**LMR1 Development**	**LMR2 Conservation**	**LMR3 Rural**	**LMR4 Agriculture**	**LMR5 Forest**
Hangman Creek	6,204	1,152	0	92,565	44,324
Lake Creek	0	0	8,397	0	0
Plummer Creek	2,796	1,967	6,219	0	16,955
Benewah Creek	0	0	0	0	34,279
St. Maries/St. Joe	1,746	45,314	0	0	0
Coeur d'Alene Lake	390	27,716	46,507	0	0
Total	**11,136**	**76,149**	**61,123**	**92,565**	**95,558**

For information for each of the land management recommendations area (LMRs), see the descriptions by color below:

LMR1: Development (Red Areas on Figure 3.2)

This land use designation in the IRMP provides for the growth and development of commercial, industrial, residential, recreation, and administrative facilities. In this LMR, development takes priority over all other uses.

- Encourage infrastructure development and designate areas for similar commercial land use such as business, industry, high density residential, recreation (commercial and private), and government facilities.
- Encourage establishing zoning regulations in the Development LMR1 for controlled growth.
- Maintain zoning regulations coordination with local and county entities for compatibility and consistency.
- Identify areas as culturally or ecologically significant and create protective designations.

- Maintain and encourage continued production on agricultural and forestlands.
- Encourage and designate areas for infrastructure expansion (water, sewer, utilities, and roads) to meet growth.
- Protect areas of designated critical habitat and wetlands.
- Encourage application of Tribal Forest Management Plan Standards and Guidelines, especially those related to riparian zone management (Appendix D).

LMR2: Conservation (Blue Areas on Figure 3.2)

This land use designation in the IRMP provides for the maintenance and protection of ecological and Tribal cultural values, which are an integral part of Tribal existence. In this LMR, conservation takes priority over all other uses.

- Discourage new pockets of commercial, industrial, residential, recreation, and government growth.
- Encourage and designate areas of existing ecological and Tribal cultural significance for protection. Increase restoration activities to move towards pre-settlement conditions.
- Areas with existing recreational development and activities could be expanded and new recreation sites could be added if a site specific analysis concluded it would enhance, be compatible, or complementary to ecological and Tribal cultural preservation.
- Allow for existing agricultural and forestlands to remain in production.
- Discourage expansion of infrastructure (water, sewer, utilities, and roads). Any new infrastructure needs would be compatible with the environment and on a case-by-case basis.
- Encourage reduction of road density for a target road density of 1 mile/square mile.
- Protect and restore areas for fisheries and wildlife habitat, Tribal cultural uses, and wetlands as opportunities arise.
- Encourage application of Tribal Forest Management Plan Standards and Guidelines, especially those related to riparian zone management (Appendix D).

LMR3: Rural (Orange Areas on Figure 3.2)

This land use designation in the IRMP provides for the maintenance and protection of the Reservation's rural character. This provides for retention of the "working" landscape, while maintaining open space and natural areas. In this LMR, retention of the Reservation's rural character would take priority over all other uses.

- Encourage maintenance of the rural character of the Reservation.
- Areas that are suggested for residential, commercial and recreational development would need to be assessed as to whether they are compatible or complementary to the rural character. Assessments may involve the type of proposed building and materials, size, proximity to other significant areas, and need. Restrictions or exclusion of specific types of recreation and specific criteria for buildings and shoreline development may be recommended.
- Design and implement development in designated areas, including infrastructure (water, sewer, utilities, and roads), that protects existing ecological connectivity and Tribal cultural uses. Any new infrastructure needs would be compatible with the environment and on a case-by-case basis.
- Encourage reduction of road density for a target road density of 3 miles/square mile.
- Maintain existing productive agricultural and forestlands consistent with the rural character.
- Encourage restoration of riparian areas in actively managed lands. Develop cooperative agreements and restore designated priority watersheds where agricultural lands have impacted riparian areas.
- Encourage application of Tribal Forest Management Plan Standards and Guidelines, especially those related to riparian zone management (Appendix D).

LMR4: Agriculture (Light Yellow Areas on Figure 3.2)

This land use designation in the IRMP provides for the maintenance and protection of the rural and agricultural character of the Reservation. Agriculture would take priority over all other uses in this LMR.

- Encourage and designate areas for agricultural production.

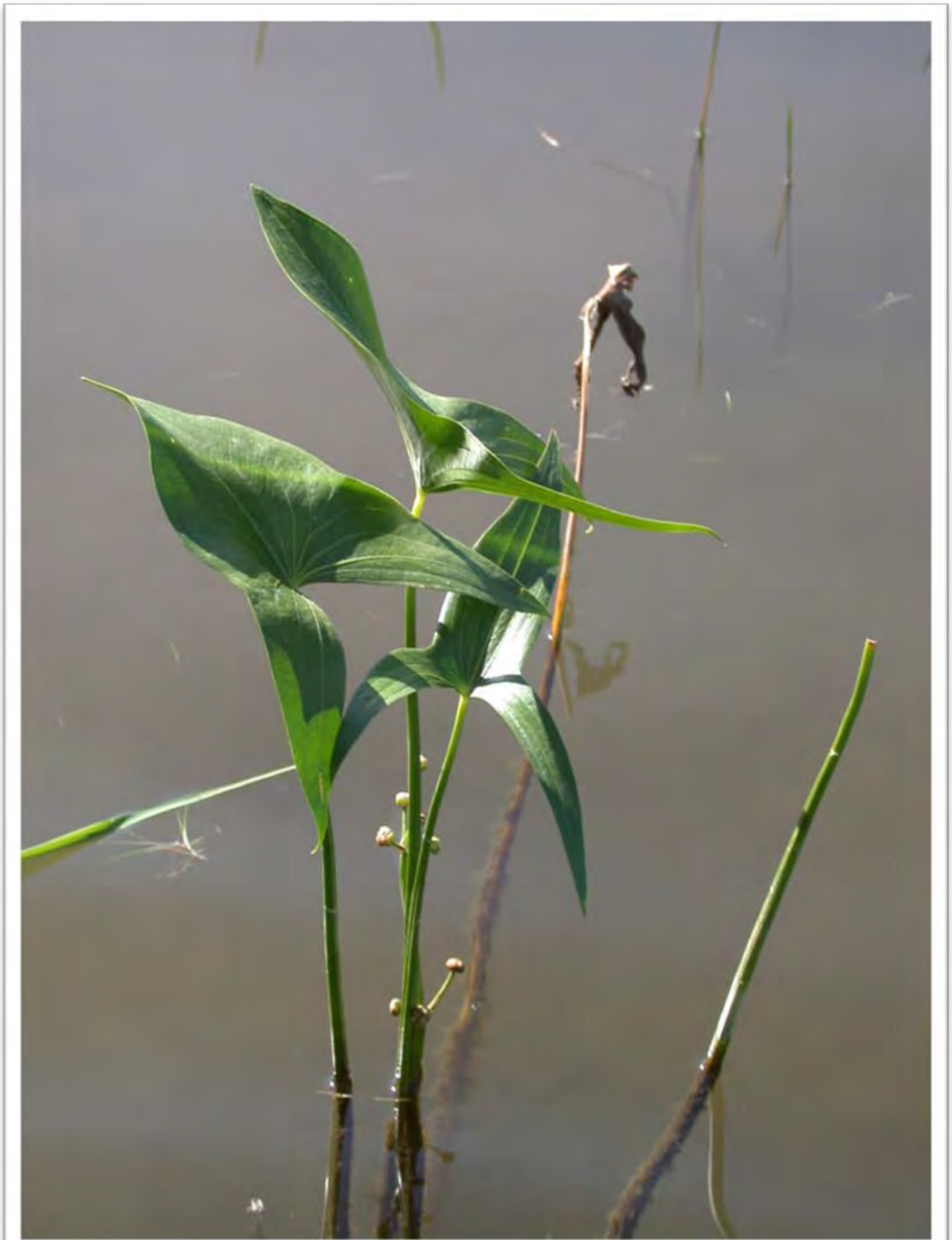
- Allow for the designation of areas for recreational activities that are complementary to agricultural land use.
- Where appropriate, recommend restoring agricultural lands back into forest or native grasslands.
- Discourage new infrastructure (water, sewer, utilities, and roads) development. Any new infrastructure needs would be compatible with the environment and on a case-by-case basis.
- Encourage reduction of road density for a target road density of 2 miles/square mile.
- Encourage application of Tribal Forest Management Plan Standards and Guidelines, especially those related to riparian zone management (Appendix D).

LMR5: Forest (Green Areas on Figure 3.2)

This land use designation in the IRMP provides for the maintenance and protection of the Reservation's forested areas. Forests and forestry activities would take priority over all other uses in this LMR.

- Encourage and designate areas for timber production. Recommend timber harvests that maintain an ecological balance and foster healthy habitats, consistent with the Tribal Forest Management Plan.
- Encourage protection and enhancement of non-timber resources (wildlife, fisheries, riparian, recreation) within the Forest LMR.
- Discourage new housing development.
- Designate areas for recreation where compatible with forestry activities.
- Discourage conversion of forestland into agricultural or other land uses.
- Discourage infrastructure (water, sewer, utilities, and roads) development. Any new infrastructure needs would be compatible with the environment and on a case-by-case basis.
- Encourage reduction of road density for a target road density of 2 miles/square mile.
- Encourage application of Tribal Forest Management Plan Standards and Guidelines, especially those related to riparian zone management (Appendix D).

Wapato, Hawley's Landing (photo by John Hartman).



Chapter Four:

20-Year Goals for the Natural and Human Environment on the Coeur d'Alene Reservation

Introduction

In Chapter 2 of the IRMP, the Coeur d'Alene Tribe describes the 100-year Desired Future Conditions for the Tribe's aboriginal territory. In Chapter 3 of the IRMP, the Tribe describes the 100-year Desired Future Conditions, 20-year goals and overall land use recommendations for the Reservation. In this Chapter, the Tribe outlines 20-year goals for the natural and human environment on the Reservation. These goals are generally broad and programmatic in nature. The Tribe has several plans that have been completed, are in development or are planned for future development that are intended to provide greater detail for many of the resource categories listed below. For the Natural Environment, the Tribe developed 20-year goals for 12 resource categories. For the Human Environment, the Tribe developed 20-year goals for 9 resource categories.

20-Year Goals

Natural Environment (Reservation)

The overall Natural Environment Desired Future Condition for the Reservation is maintenance of the healthy portions of the ecosystem and, where feasible, restoration of lost ecological components. A related goal is to conserve farmland unless it is restored to pre-settlement vegetation. Individual Tribal programs and departments responsible for specific resources would implement the programs and objectives outlined below in cooperation with other entities and the public.

Air

- Work to improve air quality to protect human health and ecology.
- Continue to address point sources of air pollution.
- Reassess guidelines for air pollutants on a continuing basis.
- Continue to collect/monitor air quality and meteorological (weather) data on Reservation and have it available for public awareness.
- Continue working relationships with federal, state and local entities to expand resource directories for pollution sources.
- Increase education/outreach and mitigation for indoor air quality health concerns.
- At a minimum, maintain air quality at the U.S. EPA status of a Class II Airshed (good air quality but not pristine).

Biodiversity

- Develop and implement management plans to control non-native species of plants, fish and wildlife by the year 2015.
- Develop and implement management plans to control noxious weeds by the year 2014.
- Continue to offer outreach programs for area residents and youth to share information about biodiversity.
- Involve Tribal elders in passing on knowledge of natural resources.
- Initiate an educational curriculum for area schools to raise student awareness of ecological processes, environmental potentials and plant and animal diversity.
- Coordinate with the local, state, federal, and private entities for the restoration and maintenance of species and habitats.
- Encourage community involvement in caring for the natural biodiversity on the Reservation.

Coeur d'Alene Lake

- Coordinate the development of a shoreline management plan.
- Continue to implement and enforce the Tribe's encroachment program.
- Monitor Lake conditions on an ongoing basis.
- Create more opportunities for Tribal members to conduct subsistence activities in Coeur d'Alene Lake.
- Manage commercial and recreational activities on Coeur d'Alene Lake.

- Continue to regulate all proposed encroachments within Tribal waters to provide safe recreational access, maintain shoreline beauty and protect biodiversity.
- Minimize pollution caused by watercraft.
- Promote active management and protection for native fishes in Coeur d'Alene Lake.
- Implement programs to reduce non-point source and nutrient pollution in Coeur d'Alene Lake to improve and maintain water quality.

Fire

- Use fire for ecological restoration activities.
- Work cooperatively to protect all structures on the Reservation from fire damage.
- Develop fuel breaks in wildland urban interface and wildland areas to protect resource values and lives.
- Develop a multi-year fire plan for prescribed burns and let burn activities for ecosystem maintenance, thereby reducing risks to wildland urban interface areas. Draft the plan in coordination with other Tribal resource managers and with other entities' fire plans.
- As areas are restored to pre-settlement fire regimes, fire will be used to maintain these conditions.

Fish

- Protect, restore, and enhance existing terrestrial and aquatic fisheries habitat resources to meet increased demands (i.e. Tribal cultural, subsistence, and recreational) on these resources.
- Restore bull trout populations to a level where adult escapement is well distributed, and at least six of the St. Joe River spawning tributaries support healthy spawning populations at any one time, and spawning is occurring in the Coeur d'Alene River portion of the basin. Harvest 1,000 fish annually from the Coeur d'Alene subbasin by the year 2020.
- Protect and restore remaining stocks of genetically pure westslope cutthroat trout to ensure their continued existence in the basin. Maintain catch rates of over 1.0 fish per hour in the St. Joe, Coeur d'Alene and St. Maries Rivers. Produce an annual catch of over 1,000 fish in Coeur d'Alene Lake and an annual catch of 11,000 fish from Lake, Benewah,

Evans and Alder Creeks. Achieve good fish population distribution throughout the tributaries to the basin.

- Protect and enhance any remaining stocks of Redband trout or other salmonids present in the Hangman watershed. Specifically, achieve good spawning populations in Mission Creek, Sheep Creek, Nehchen Creek and Indian Creek. Achieve good rearing habitat in the mainstem of Hangman Creek to allow migration of trout from the Spokane River.
- Provide both short and long-term harvest opportunities that support Tribal subsistence activities and a sport-angler harvest. Maintain fisheries for introduced species to include an annual harvest of greater than 500,000 kokanee, greater than 5,000 chinook salmon, greater than 10,000 rainbow trout in Tribal catch-out ponds, and an average catch rate of greater than 0.5 fish per hour for largemouth bass.
- Implement Tribal Fisheries Management Plans to achieve 20-Year goals and 100-Year DFCs.
- Restore, protect, expand and reestablish fish populations in select areas to sustainable levels to provide harvest opportunities.
- Encourage community involvement in caring for native fish populations and habitats.
- Develop cooperative agreements, design habitat restoration projects and pursue funding to accomplish fisheries goals.

Forest

- Manage for the long-term health of forests by continuing to implement the Tribal Forest Management Plan on Tribal and allotted lands in order to develop, maintain and enhance forest land in a perpetually productive state utilizing the principles of sustained yield.
- Maintain areas designated for a single or multi-story well stocked forest, providing goods and resources to the community without seriously conflicting with other natural resource elements. Enhance multiple use goals and practices on allotments and Tribal trust lands.
- Encourage forest restoration in identified areas where forested lands have been converted to agricultural areas.
- Encourage private landowners on the Reservation to coordinate their forest practices with Tribal forest management to provide consistent management.
- Maintain the Continuous Forest Inventory (CFI) system in order to provide growth and mortality information.

Minerals

- Formulate an interdisciplinary team and implement a program to review all proposed mining activities and assess potential impacts based on submitted work plans by the year 2014.
- Develop a GIS database to track locations of all mining activities, including rock quarries and material sites.
- Review the federal mining code, research developing a Tribal Mining Code and, if warranted, write a Tribal Mining Code.
- Develop up to three additional Tribal aggregate mining sites (less than 5 acres each) when not in conflict with ecologically and culturally sensitive areas.
- Any mining conducted on the Reservation should be done in a manner which does not negatively affect surrounding lands, waters, biotic or cultural resources.

Riparian Areas

- Inventory current riparian conditions in key watersheds to identify areas that are in need of restoration and to identify areas that currently function properly and need protection by the year 2014 (key watersheds are Evans, Alder, Benewah, Lake and Hangman).
- Prepare and implement general and specific restoration plans in key watersheds.
- Develop a cost efficient means of replanting native vegetation and to stabilize streams in key watersheds.
- Acquire riparian habitat for maintenance and/or restoration in key watersheds.
- Work with landowners and agencies to provide cost share and incentives for riparian protection and restoration.
- Protect, restore and enhance riparian areas.
- Encourage use of Tribal recommendations for minimum buffers on all Reservation streams (Appendix D).
- Encourage community involvement in caring for riparian resources.

Soil

- Reestablish trees or permanent cover on land with marginal soil classes.
- Encourage more minimum till and/or no-till farming techniques.
- Improve soil fertility through the use and monitoring of Best Management Practices (BMPs).
- Improve soil permeability through the use and monitoring of BMPs.

Water

- Expand the Tribal Water Resource Program to bring Reservation streams and lakes into compliance with the Tribe's Water Quality Standards by the year 2024. Protect these streams and lakes from anthropogenic (human-caused) pollution.
- Coordinate with other entities and the public to restore Reservation water bodies to Tribal water quality standards.
- Coordinate with other entities and the public to bring the 303(d)-listed water bodies into compliance with water quality standards through the implementation of Total Maximum Daily Loads (TMDLs) and Tribal water quality standards.
- Encourage implementation of water quality-based BMPs on all Reservation streams.

Wetlands

- Restore proper functioning conditions to a minimum of 30 percent (estimated at 6,425 acres) of the native riparian/wetland habitats to support vertebrate species that use these habitats by the year 2024.
- Coordinate with other entities and the public to restore and maintain wetlands.

Wildlife

- Reintroduce as many of the native extirpated (locally extinct) wildlife species within the Reservation as possible.
- Control populations of non-native wildlife species within the Reservation, especially those that adversely affect native populations.
- Establish and implement annual population monitoring of culturally important species.

- Establish designated travel corridors that provide refuge for wildlife species.
- Quantify the effects of predators on game species, particularly big game.
- Establish a process of monitoring calving success on all big game species.
- Designate summer and winter range for big game on the Reservation and manage fires and forest harvest to maximize forage availability on summer ranges.
- Adjust road closures as necessary to ensure protection of wildlife populations during critical periods.
- Protect and restore a minimum of 1000 acres of Palouse Steppe.
- Designate 1000 acres of moist coniferous forest for development of old growth conditions.
- Designate 2500 acres of low elevation dry forest habitat for development of old growth open woodland conditions.
- Coordinate with other entities and the public to restore and maintain wildlife habitats and species across the Reservation, including Threatened and Endangered Species (TES).
- Provide short and long term harvest opportunities that support both subsistence activities and limited sport harvest.
- Continue to pursue and acquire funding to protect and/or restore key pieces of wildlife habitat such as wetlands, riparian areas and big game winter range.
- Encourage community involvement in caring for wildlife populations and habitats on the Reservation.

Farmland (photo by John Hartman).

Human Environment (Reservation)

The overall Human Environment Desired Future Conditions for the Reservation are:

- To ensure the health and safety of Coeur d'Alene Tribal members and Reservation residents by means of an environmental health program that manages environmental factors responsible for contamination, disease transmission and personal injuries.
- To allow for moderate development in designated areas that is visually pleasing, energy efficient, and with infrastructure of the highest standards.
- Ensure that the power and telecommunications infrastructure supports the Tribal Government, public safety personnel (fire/medical/police), medical facilities, educational institutes, planned new development, and Reservation communities. The infrastructure must be reliable. It should include multiple access mechanisms to accommodate remote customers.
- To assist in providing a high quality of life for all Reservation residents.

Agriculture

- Retain existing farmland for future generations, restore marginal farmlands to forest lands. Continue to grow wheat, barley, lentils, peas and grass seed.
- Reduce agricultural-related erosion by 25 percent by the year 2024.
- Reduce the application of chemicals by 50 percent on agricultural lands by the year 2024.
- Evaluate Tribal agricultural lands for productivity and determine the suitability of other resource values by the year 2014.
- Work with other entities and the public to evaluate private, non-Trust agricultural lands for productivity and to develop management recommendations.
- Reduce soil erosion through implementation of agricultural Best Management Practices (BMPs).
- Encourage planting of perennial crops and utilizing no-till farming practices to reduce soil erosion.
- Continue to research alternatives to agricultural field burning.
- If feasible alternatives to agricultural field burning are developed, then implement them to reduce emissions.
- Develop a botanical garden and a youth garden.

Development

- Encourage well thought out development projects in designated areas through sound planning.
- Develop visually pleasing buildings that are complimentary to the natural and cultural setting in environmentally suited areas.
- Provide for a Tribal culturally specific built environment.
- Coordinate land use and development patterns (planning and implementation) between the Tribe, other entities and the public.

Energy

- Research, develop, and promote the use of alternative energy and fuel sources such as wind, solar, hydrogen, and others.
- Promote the research and use of alternative technology to conserve energy and other resources.
- Regulate the use and transport of nuclear materials on or through the Reservation consistent with federal law.

Environmental Health

- Assist in the proper design, construction and operation of schools, day cares, private water and septic systems, food service facilities and community buildings for optimal public health and safety.
- Strengthen the collaboration between Tribal Environmental Health, Benewah Medical Center and the State of Idaho’s Panhandle Health District.
- Work to eliminate the installation and operation of sub-standard water and sewer systems.
- Eliminate vector-borne illnesses on the Reservation through the use of integrated programs for pest control, habitat management, and public education.
- Develop programs to deal with chemical and physical hazards, including hazardous chemical spills, household hazardous chemicals, and preventable injuries.
- Assist in the process to design, construct, and operate public water recreation facilities (including swimming pools, spas, waterslides, spray pools, and bathing beaches) to meet or exceed all applicable standards for

sanitation and safety. Reduce or eliminate waterborne illnesses associated with these types of facilities.
- Clearly define and expand the role of the Tribal Environmental Health Program.
- Collect data on potential contaminants and, if found, eliminate or mitigate.
- Continue State/Tribal cooperation with Idaho State inspections.
- Develop Tribal primacy where desirable and feasible.

Housing

- Work with other entities and the public to establish habitat corridors and provide open space.
- Protect fish and wildlife habitat during construction using BMPs.
- Implement the Tribal Housing Authority Indian Housing Plan.
- Coordinate with other entities and the public to incorporate conservation subdivision designs into housing developments.
- Work with other entities and the public to create consistency between Tribal and non-Tribal housing plans, especially for the location and density of new housing.

Infrastructure

- Ensure that the transportation, power and telecommunications infrastructure supports the Tribal Government, public safety personnel (fire/medical/police), medical facilities, educational institutes, planned new development, Reservation communities, access to farm and market roads and amenities suitable for a rural population.
- Continue to provide universal broadband services that are capable of integrating voice, data, and video, as well as other emerging technologies.
- Prepare a power and telecommunications master plan and incorporate it into the Tribal Comprehensive Plan, and Tribal Code.
- Work with Tribal and non-Tribal governments and the public to develop a coordinated transportation management plan for the Reservation.
- Continue to update and implement the Tribe's transportation plan.
- Coordinate a water/sewer management plan with counties and cities within the Reservation.

Pesticides

- Continue to maintain, enforce and update the Coeur d'Alene Tribal Code and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) on Circuit Rider Cooperating Reservations.
- Continue compliance use inspections and follow-up inspections.
- Continue to communicate with nationwide Tribal pesticide enforcement programs through existing networks such as Tribal Pesticide Program Council (TPPC) and the Institute for Tribal Environmental Professionals (ITEP).
- Build/enhance relationships with the regulated community regarding Tribal pesticide enforcement activities on the Reservation.
- Enhance relationships with the Idaho State pesticide program to improve communication and cooperative investigations.

Recreation

- Implement a State/Tribal trail management plan for the Trail of the Coeur d'Alenes.
- Develop and update recreation codes that meet the needs of future Tribal activities.
- Manage the Reservation segment of the "Trail of the Coeur d'Alenes."[1]
- Work closely with the State of Idaho to assure a seamless connection between State and Tribal portions of the Trail of the Coeur d'Alenes.
- Develop a Tribal Recreation Plan.
- Identify and develop additional recreational sites and parks as desired and appropriate.
- Develop a boat launch and campsite.
- Aid in the development of Camp Larson (recreation facility) planning and operations.

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[1] The Tribe's management of the trail as a protective barrier is not being addressed by this document. Rather, the State of Idaho and the Tribe are performing this function pursuant to an agreement in connection with Coeur d'Alene Tribe v. Union Pacific Railroad (case # 91-0342 D. Idaho).

Solid/Hazardous Waste

- Properly store, transport, handle, and dispose of hazardous materials.
- Coordinate with other entities and the public to implement the Tribe's solid waste management plan for the Reservation.
- Promote source reduction, composting, reuse and recycling of solid wastes.

Trail of the Coeur d'Alenes (photo by John Hartman).

Chapter 5

Existing Conditions of the Natural and Human Environment[2]

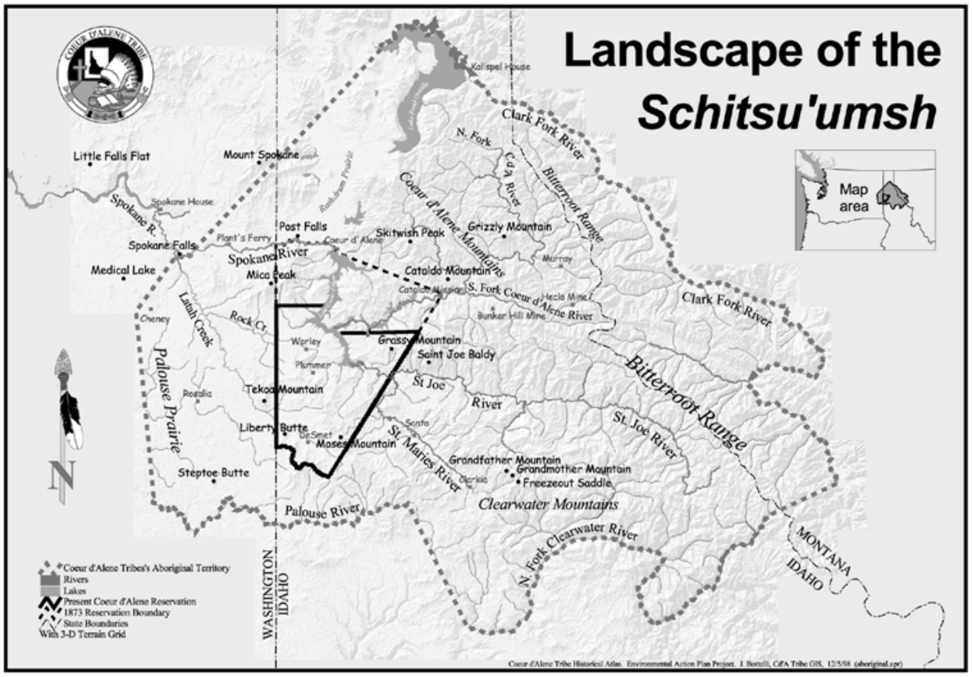
Before the coming of Human Peoples, the world was inhabited by powerful Animal Peoples, or "First Peoples". Coyote, Crane, and Chief Child of the Yellow Root were the most prominent, and through their actions the world was prepared for the coming of the Human Peoples.
(Frey and the Schitsu'umsh 2000)

Introduction

The purpose of this chapter is to describe the existing or affected environment, including conditions and trends that have been identified. The description's focus is the lands and waters of the Coeur d'Alene Reservation, but includes the Tribe's aboriginal territory where appropriate.

This chapter focuses on those portions of the environment that are directly related to the conditions and resource categories with the exception of the addition of the Land Use, Social and Economics categories. The description is not meant to be a complete portrait of the study area, but is intended to portray the conditions and trends of most concern to the Coeur d'Alene Tribe, the public and agencies involved in the management of the Reservation at the broad scale.

[2] Material in this chapter was previously Chapter 3 in the FPEIS, with minor modifications.



5.1 Landscape

The Coeur d'Alene, the *Schitsu'umsh*, "the ones that were found here", were placed by the Creator in what would become the Panhandle region of Idaho. It was a landscape of some 5,000,000 acres of diversity with fir, ponderosa pine, white pine and cedar-forested mountains with freshwater rivers, lakes and a multitude of wetland complexes and marshlands. The rolling hills and prairie were covered with perennial bunchgrass, fescue wheat grass, camas and many other plants significant to the Coeur d'Alene Tribal culture and subsistence. Coeur d'Alene territory extended from Lake Pend Oreille in the north to the Bitterroot Range of Montana in the east to the Palouse and North Fork of the Clearwater Rivers in the south to Steptoe Butte and up to just east of Spokane Falls in the west. At the heart of this region was Coeur d'Alene Lake. It was a homeland abundant with "gifts" from the Creator provided by Animal Peoples that sustained more than 5,000 Coeur d'Alenes (Frey and the Schitsu'umsh 2000).

Through a series of Executive Orders of 1867, 1873, 1887, and 1889, the Coeur d'Alene Reservation was established and the original land base of the Coeur d'Alene people significantly reduced. Much of the Tribe's former territory was acquired without compensation for ceded lands. The 1887 agreement also resettled many Spokane families onto the Coeur d'Alene Reservation. Also in 1887 came the passage of the General Allotment Act, also known as the Dawes Act, authorizing the President to allot portions of reservation land to individual Indians. Allotments of 160 acres were to be made to each head of family and 80 acres to others. Title to the allotted lands was to remain in the United States in trust for 25 years, after which it was to be conveyed to the Indian allottee in fee free of all encumbrances. Unallotted land was called "surplus" and opened up for homesteading by non-Indians. In 1906, the Allotment Act was implemented on the Coeur d'Alene Reservation, resulting in a massive loss of Tribal land holdings, rendering most agricultural practices infeasible, and an opening up of "unused" Reservation lands to non-Indian ownership. By 1921, the once-successful Tribal farmers were reduced to only four Coeur d'Alene families that were able to productively continue farming their allotments (Frey and the Schitsu'umsh 2000).

Currently, the aboriginal territory of the Coeur d'Alene Tribe contains several cities including Spokane, Coeur d'Alene, Sandpoint, and Post Falls. The area has been used and is currently used for Tribal subsistence and cultural activities, agriculture, forestry, mining, industrial/commercial, and recreation. The Tribe currently is solicited and consults with local, state, federal, and Tribal entities regarding land use changes or projects that would change land classification to protect Tribal and environmental values (which are often the same) across the landscape. The Tribe is very active in maintaining Tribal cultural and ecological values throughout the aboriginal landscape with the understanding that growth should be consistent with proper planning and land capability.

DeSmet in 1920 (photo from the Father Connelly Collection).

5.2 Cultural

The Cultural Affected Environment is divided into three Sections. The Tribal Culture and Subsistence Section 5.2.1, describes the Coeur d'Alene Tribal Culture, and the lifestyle that is maintained based on that Tribal culture. Section 5.2.2 discusses the laws and regulations directing federal agencies to locate, identify, evaluate, preserve, protect and manage Tribal cultural resources significant to the heritage and history of the area. Section 5.2.2 also discusses the existing sacred sites and traditional cultural properties.

5.2.1: Tribal Culture and Subsistence

Before the coming of Human Peoples, the world was inhabited by powerful Animal Peoples, or "First Peoples" (Frey and the Schitsu'umsh 2000). Coyote, Crane, and Chief Child of the Yellow Root were the most prominent, and through their actions the world was prepared for the coming of the Human Peoples. This was a time when great monsters were slain, the features of the landscape were formed and implanted with "gifts" to sustain body and spirit, and the ceremonies, social practices and "teachings" necessary to bring order and happiness to the *Schitsu'umsh* or Coeur d'Alenes.

During this time the Human Peoples were created and placed on their respective lands. To the west and northwest of the Coeur d'Alene were the Spokane and Kalispel, the north and northeast the Kootenai and Pend Oreille, to the east the Flathead, and placed to the south and southwest of the Coeur d'Alene were the Nez Perce and Palus (Frey and the Schitsu'umsh 2000).

Traveling by canoes along the waterways and by foot over the dirt trails, the Coeur d'Alene families followed well-established, seasonal patterns of movement throughout the landscape and beyond (Frey and the Schitsu'umsh 2000). Their canoes were fashioned from long strips of bark from either cedar or pine trees. In the spring the winter villages located along the shores of Coeur d'Alene Lake and banks of the St. Joe, Spokane, and Coeur d'Alene Rivers were abandoned for the root gathering areas located in the prairie country. Primarily there were 16 species of root relied upon including bitterroot, camas, and cous. During the spawning runs of spring and into the fall, families also traveled to the fishing areas. As anadromous fish did not enter Lake Coeur d'Alene, chinook and sockeye salmon and steelhead trout were fished and traded for at locations such as Spokane Falls, Kettle Falls and as far away as Celilo Falls. During these trading gatherings, the Coeur d'Alene would exchange dried venison and deer hides for salmon, and renew social ties with dancing and feasting (Frey and the Schitsu'umsh 2000).

During the summer, individuals, both men and women, could be found in the adjacent mountains, fasting and seeking visions. As with preparations for a hunt or travel into a distant country, a sweat bath would often precede the journey to a fasting site. The small, dome-shaped, earth-covered lodge might be addressed as "Grandmother" or "Great Grandfather of Grandfathers." In the steamed-heat, prayer would be offered and bodies and souls spiritually renewed and cleansed.

By mid-summer and into early fall, the last of the camas would have been dug and the berry picking would begin. Twenty-two types of berries were gathered, primary among them chokecherry, huckleberry, and serviceberries. As with the root digging, fishing, and game hunting, prayer would precede the activities associated with gathering berries. In late fall the "water potato" was gathered along the marshy regions of Coeur d'Alene Lake. Of all the regional Tribes, only the Coeur d'Alene gathered this particular root (Frey and the Schitsu'umsh 2000).

The fall was the season for intensive game hunting, including reliance on white-tail deer, mule deer, elk, moose, and black bear. The deer and elk were often addressed as "Brothers" and would "offer themselves up" only to deserving and respectful hunters. As with the roots and berries gathered, and fish caught, a portion of the meat from the hunt would be freely given to families and individuals most in need (Frey and the Schitsu'umsh 2000).

With the coming of winter, the families would return to their village sites along the lake's shore and rivers' banks. These were the sites of the "long communal houses." Up to 90 feet in length, the lean-to lodges were constructed with poles and coverings made of tule reeds tied into mats. The communal lodges could accommodate several families, each represented by a separate "fire pit." Conical structured, tule-mat covered lodges were also used. There is no evidence of use of the semi-subterranean pit house typically used by other Tribes in the region.

During the long winter nights, the elders would re-tell the oral traditions of Coyote, Crane, and Chief Child of the Yellow Root, the young learning of and the old renewing in the "teachings" offered. Communal deer hunting and ice fishing would continue throughout the winter, culminating in a yearly subsistence-cycle in which roots and berries, fish and salmon, and game meat each contributed about a third to the total diet of the Coeur d'Alene (Frey and the Schitsu'umsh 2000).

The goal is the preservation and restoration of Coeur d'Alene Tribal culture through maintaining the landscape's ability to provide for Tribal subsistence practices such as root and berry gathering, fishing, and hunting.

5.2.2: Cultural Resources and Traditional Cultural Properties

This section includes the National Historic Preservation Act of 1966, as Amended, and its implementing regulations and the Archeological Resources Protection Act of 1979. These regulations require federal agencies to make determinations of eligibility, effect, and treatment in consultation with the Advisory Council on Historic Preservation. This also directs federal agencies on how they should implement and manage cultural resource protection throughout the landscape. Traditional cultural properties refer to areas within the landscape that are considered sacred or are ceremonial or spiritual in nature (mountains, land areas, structures, plants and animals) in the past and currently. These properties may be listed in the National Register of Historic Places.

Executive Order (EO) 13007 provides that federal agencies, to the extent practicable, permitted by law and consistent with essential agency functions, accommodate access and avoid impacts to the physical integrity of sacred sites. During the IRMP planning process, the Coeur d'Alene Tribe specifically identified no site as a sacred site due to the programmatic nature of the document. However, as site-specific projects are undertaken, the Tribe will protect cultural resources and traditional cultural properties in compliance with Tribal traditions, the National Historic Preservation Act and with EO 13007. Management of cultural resources and traditional cultural properties is implemented through the Tribe's Culture Committee and the *hndesnet* (Culture Department).

Mountain stream (photo by Norris Boothe).

5.3 Natural Environment

The history and Tribal culture of the Coeur d'Alenes are ageless and interwoven in the natural environment. As the Animal Peoples had originally prepared the world, they continued to prepare and nurture the lives of individual Human Peoples with the gifts of the natural environment so long as the people are responsible and care for the gifts given them. For the Coeur d'Alenes, without the natural environment there is no past, present, or future.

5.3.1 Air Quality

To the Coeur d'Alenes, one of the many gifts left by the Animal Peoples, as important to the Human Peoples as the water, was air. Without the gifts of air and water there was no beginning. The understanding of the importance of environmental factors and the reverence towards them is deeply embedded in Coeur d'Alene Tribal culture.

5.3.1.1: Indoor Air Pollution

Despite the fact that most people spend the vast majority of their time indoors, very little information exists on indoor air quality. However, a number of known sources of indoor air pollution exist on the Reservation, including wood stoves, gas furnaces, second-hand tobacco smoke, synthetic building materials, molds and bacteria, pesticides, harsh cleaning chemicals and indoor radon.

Nearly 4,000 chemical compounds are found in tobacco smoke; more than 50 are known or suspected human carcinogens. Smoke from wood-burning stoves and fireplaces has been shown to contain 17 priority pollutants and up to 14 carcinogens.

Radon is a natural source of radiation that can become concentrated indoors and is an indoor air concern in many areas. Based on results of 1998 radon testing on the Reservation, about 7 percent of a total of 169 tests exceeded the federal "action level".

Based on other comparative risk projects, the next highest cancer risks in indoor air after radon and environmental tobacco smoke are attributed to volatile organic compounds, especially formaldehyde. The principal indoor sources of formaldehyde are pressed wood (particle board), urea-formaldehyde foam insulation, and household cleaning agents (Coeur d'Alene Tribe 2000b).

5.3.1.2: Outdoor Air Pollution

Outdoor air pollution is regulated under the federal Clean Air Act. To measure outdoor air quality, regulators use six "criteria pollutants" as indicators of air quality, and the Environmental Protection Agency has established maximum concentrations for each of them, above which effects to human health may occur. The six criteria pollutants include:

- particulate matter (PM10 and PM2.5)
- carbon monoxide (CO)
- ozone (O3)
- sulfur dioxide (SO2)
- lead (Pb)
- nitrogen dioxide (NO2)

The EPA has divided the particulate matter criterion into two separate criteria: "PM10", which was previously the only particulate criterion, and which includes particulates less than 10 but greater than 2.5 microns in diameter; and "PM2.5", which is a newer criterion and which includes all particulates less than 2.5 microns in diameter. A micron is one-millionth of a meter. The newer PM2.5 standard is in response to more recent studies that show the very fine particles from combustion-related sources (such as vehicle emissions, power plants, wood burning, agricultural burning and other industrial and residential sources) cause greater health effects than the larger PM10, which may include road and agricultural dust.

Based on several years of monitoring, Spokane County, which borders the Reservation to the west, has determined the primary causes of air quality degradation in the county include *wood burning, field burnin*g, and *road dus*t. Although monitoring of outdoor air quality on the Reservation is limited, wood burning, field burning, and road dust also appear to be the primary causes of air quality problems on the Reservation.

Particulate matter, the term for everything non-gaseous found in the air, is the criteria pollutant most commonly associated with all of these air pollution sources. In Spokane County, particulate matter comes mostly from wood burning and dusts from unpaved and paved roads. During the months of August and September, however, 50 to 75 percent of particulates in Spokane come from the burning of bluegrass in eastern Washington and northern Idaho. Burning of wheat stubble is also conducted during this period.

During 1997, the Tribe conducted particulate matter monitoring throughout the Reservation. No air quality exceedances for PM10 were observed during this period. However, information indicates the greatest air quality threat to health is the peaks of pollution occurring for short periods (Coeur d'Alene Tribe 2000b). The Coeur d'Alene Tribal office of Air Quality is collecting Metrological and PM 2.5 data at a Plummer site in order to alert the public of air quality levels and when conditions of air quality are in an unhealthy range. This is set by the Air Quality Index (AQI) that could affect sensitive groups such as children and the elderly and determine when a Burn Ban would be enforced Reservation wide. Monitoring for wild fire activity, agriculture field burning, weather inversions and from sources off Reservation are reported to EPA and other local agencies. Quarterly data has been collected since 2007 and is submitted to the Environmental Protection Agency (EPA) Air Quality System (AQS).The Plummer monitoring site is one of a network of monitors used together with other tribes and state agencies located in the nine northern counties of Idaho.

5.3.2 Biodiversity

The Coeur d'Alene people view the lakes and rivers, and the surrounding mountains with deer and camas as family. These are some of the components of the biological diversity (biodiversity) throughout the Reservation and the aboriginal territory. To think of these biological components as family is clear insight to the importance of landscape and biological diversity to the Coeur d'Alene Tribe.

Biodiversity refers to the diversity of life in all its forms and all its levels of organization, not just the diversity of plant, animal, and microorganism species. At the basic level, biological diversity even includes the organic molecules that comprise the genetic basis of life. On the other end of the spectrum there are biomes: These are the vast stretches of tundra, desert, forest, and ocean that reflect the planet's diversity of climate and physical form. In between are a multitude of levels of organization including population, race, subspecies, community, and ecosystems all as components of the larger concept, biological diversity.

The fundamental reason for managing for diversity is simple: all life forms have value. The Coeur d'Alene Tribe knows this; it is within the Tribe's culture. Aldo Leopold wrote in 1949 "*The last work in ignorance is the man who says of an animal or plant: 'What good is it?' If the land mechanism as a whole is good, than every part is good, whether we understand it or not . . . To keep every cog and wheel is the first precaution of intelligent tinkering.*" However, there are two significant problems with measuring biological diversity. First, the classification schemes do not exist except at the species level of organization. The second is that even species diversity is extremely difficult to thoroughly measure. In order to establish the base line for the Reservation for biodiversity we will consider that every species has a unique set of habitat requirements, an ecological niche consisting of its preferred physical environment. In this Chapter we will use existing information in an effort to establish the types, amounts, and distribution of the flora and fauna on the Reservation to understand the present nature of biodiversity on the Reservation. Appendix E has a list of species common to the Reservation lands including culturally significant species.

Historically, the Reservation and aboriginal territory had a diversity of species. The abundance of water, forests and transitional lands, prairie, and wetland complexes provided terrestrial and aquatic species with various structure and components of habitat. Forest types once dominated by large, mature or old growth ponderosa pine and white pine have been lost. Total white pine populations have been greatly reduced due to timber harvest, natural fire and blister rust. Palustrine wetlands have been converted to other land uses and an estimated 114,000 acres of combined forest, grassland, and shrub types have also been converted to agriculture, housing, and development.

The loss of wetland, forest, shrub and grassland habitat has an impact on plant species populations, diversity, and connectivity of habitat. Grizzly bears, Canadian lynx, gray wolf, wolverines and woodland caribou populations may have been extirpated from the Reservation due to these losses of habitat. Native populations of steelhead and salmon, in Hangman Creek, are extinct and Cutthroat trout and bull trout populations are severely depressed throughout the Reservation. Even with these changes, the landscape and Reservation are considered to still have a moderate to high landscape diversity based on the type and abundance of species and habitat remaining. However, the trend for some species is currently downward. In the following Sections we will discuss these species and trends in order to assess the impacts of the alternatives on biodiversity.

In general, all agricultural practices tend to result in the reduction of native plant populations and diversity. Conversion of native plant communities to monoculture crops eliminates native plant communities. Chemical use, cultivation and grazing can also affect plant species on croplands and adjacent areas, affecting both population and diversity. Agricultural development is believed to have caused the loss of an estimated 21,417 acres of Palustrine Wetland plant communities on the Reservation. The majority of this loss is in Hangman Creek.

Impacts of agricultural practices on animal populations and diversity are determined by the extent of habitat alteration, which occurs as the result of that practice. Obviously, impacts to populations and species diversity can be significant through indirect alteration of habitat (Ratti and Scott 1991). Chemical insecticides can cause direct toxicity to birds, and also reduce insect populations used as food sources (Weigand 1980; Green 1984; Potts 1986; Rands 1986).

The effects of grazing on wildlife populations vary depending on the species, and the intensity of the grazing. This is most likely related to feeding and nesting differences in the species. Leininger and Schultz (1991) reported similar results between small mammals and grazing, with 28 individuals being observed on a grazed site vs. 41 individuals within an ungrazed site. Grazing can also reduce species diversity. Reynolds and Trost (1980) reported that diversity among small mammals was decreased on grazed sites in Idaho. Resting a grazed area has also shown that these areas can recover from disturbance. Songbird, raptor, and small mammal use and diversity increased 350% after grazing had been halted for 8 years from a site in Utah (Duff 1979).

Forestry practices, such as cutting method, logging system, and slash disposal/site preparation methods alter species composition, and alter plant populations and species diversity. Forestry practices generally affect fish and wildlife populations indirectly through alteration of habitat. No single forestry practice will affect all wildlife and their populations in the same manner. Some species are dependent on old growth forest conditions, some on early seral (successional) conditions, and still others somewhere in between. Forestry practices that result in a variety of habitats will likely lead to the greatest species diversity.

Plant populations can be directly affected by construction of recreation facilities, such as campgrounds, toilets, boat ramps and roads. Hiking trails, off-road vehicle use, and boat traffic can also reduce plant populations and species diversity by directly damaging or destroying plants, altering site conditions, or otherwise disrupting plant habitat.

Recreation impacts to wildlife are generally related to changes in habitat quantity or quality. Campgrounds, especially when constructed within riparian zones, often decrease wildlife habitat because of human disturbance, trampling, soil erosion and compaction, and loss of vegetation. These factors can act to reduce wildlife populations in situations where the site is a direct migration route, breeding or nesting area, or a site of other highly important habitat in short supply within the surrounding landscape.

The two most significant impacts associated with human habitation are the elimination of plant habitat, and the introduction of exotic species. Humans have intentionally and unintentionally introduced a number of non-native plant species to northern Idaho. The Coeur d'Alene Reservation supports 189 non-native plant species (Montana Department of Agriculture 1998), sixteen of which are legally considered noxious in the State. Because these plants have not evolved with other species in the area they do not have natural systems to keep them in check. As a result, many non-native plants overwhelm native plant communities, disrupt complex ecosystems, reduce biological diversity, jeopardize endangered plants and animals and degrade habitat. A list of non-native plants can be found in Appendix E.

Elimination or alteration of habitat, and introduction of exotic species (including dogs, cats, etc.) affect animal populations and species diversity. In agricultural areas, windbreaks and shelterbelts provide many birds, small mammals, reptiles, and amphibians with shelter and food sources (Yahner 1982).

There are approximately 225 miles of paved and 1,154 miles of gravel/dirt/unknown material roads on the Coeur d'Alene Reservation (Coeur d'Alene Tribal G.I.S. 2003). Road surfaces and adjacent ditches displace native plant species. Even after dirt roads are retired, soil compaction in the tire tracks continues to prohibit establishment of woody vegetation for as much as five years (Krueger 1998b). In addition to this loss of available habitat, automobiles are one of the primary ways that non-native plant seeds are dispersed. Non-native plants, such as reed canary grass, are abundant in roadside ditches on the Reservation.

Roads primarily affect animal populations indirectly through alteration of habitat. However, roads do lead to direct mortality of wildlife (automobile collisions), increased hunter access and success rates, and contribute to habitat fragmentation. Roads can cause an edge effect through forested areas creating habitats beneficial to some wildlife species. More species are usually found near edges, which provide habitat overlaps. However, roads tend to fragment habitat areas.

5.3.3 Coeur d'Alene Lake

"Coyote tricked Rock into chasing him throughout the country and eventually into the Lake, ridding the land of the monster who had been crushing the lodges of the other Animal Peoples. And in so doing many of the near-by mountains and prairie were created, as well as the "blue' of Coeur d'Alene Lake" (Frey and the Schitsu'umsh 2000).

Coeur d'Alene River headwaters originate near the Idaho-Montana border and extend westward, draining approximately 2,360 square miles of the western slope of the Bitterroot Mountains. The North and South Forks come together near Enaville to form the main stem, a low gradient meandering river in a broad valley. In this valley, 12 lateral lakes and thousands of acres of wetlands and other floodplain habitats are hydraulically connected with the main stem. The main stem of the Coeur d'Alene River flows into Coeur d'Alene Lake near Harrison. The St. Joe and St. Maries Rivers also flow into the Lake. Coeur d'Alene Lake discharges through the Spokane River, which is a tributary of the Columbia River.

In 2001, the U.S. Supreme Court reaffirmed the Tribe's ownership of the southern third of Coeur d'Alene Lake and a portion of the St. Joe River. *Idaho v. United States and Coeur d'Alene Tribe, 533 U.S. 262, 121 S.Ct. 2135, 150 L.Ed.2d 326 (June 18, 2001).*

Over a 100-year period the mining industry in Idaho's Silver Valley dumped 72 million tons of mine waste into the Coeur d'Alene watershed. As mining and smelting operations grew, they produced billions of dollars in silver, lead and zinc. In the process, natural life in the Coeur d'Alene River was disappearing. The Tribal Council in 1991 worked to force restoration of the Coeur d'Alene watershed, and in 1996 the Coeur d'Alene Basin Restoration Project, the largest natural resource damage case in American history, began.

The Silver Valley is the nation's second largest Superfund site. The Tribe's natural resource damage assessment for the river, its tributaries, the lateral lakes and Coeur d'Alene Lake totals over 1 billion dollars. The Tribe, working with the U.S. Environmental Protection Agency, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the Bureau of Land Management and the U.S. Geological Survey, has taken the leading role in cleanup efforts and the leading role toward responsible stewardship on the basin and Coeur d'Alene Lake, which is the heart of the Tribe's homeland and Reservation.

The Natural Resources Damage Assessment, the Coeur d'Alene Basin Remedial Investigation/Feasibility Study (RI/FS) and the Coeur d'Alene Lake Management Plan are addressing mining-and/or milling related resource impacts independent of the EAP Assessment and IRMP.

Impacts of Post Falls Dam

There have been enormous impacts to Coeur d'Alene Lake from the operation of the Post Falls Dam. Included below is the Executive Summary from the Tribe's Impacts Assessment report as part of the Federal Energy Regulatory Commission's relicensing process (Coeur d'Alene Tribe 2005).

> "This Impact Assessment was prepared by the technical staff of the Coeur d'Alene Tribe as an effort to document, in a scientific framework,

the effects on natural and cultural resources that nearly 100 years of Lake level regulation have produced. This Lake level regulation was initiated by the Washington Water Power Company (now Avista Corporation) in 1906 to capitalize on the abundant water resources within the Spokane River system to produce electricity for the growing ‘Inland Empire’ region (eastern Washington and Northern Idaho). But the development of the hydropower ‘resource’ has brought many changes to this system, perhaps the most profound of which occurred to Coeur d’Alene Lake, a natural Lake system which had been supporting the Coeur d’Alene Indian people for untold generations. This report, then, is a comprehensive evaluation of the effects of the Spokane River Hydroelectric Project on the people and resources of Coeur d’Alene Lake.

Creation And Purpose of The Coeur d'Alene Tribal Reservation

- The Reservation for the Coeur d’Alene Tribe was established by an 1873 Executive Order of President Ulysses Grant and confirmed by Congress in 1891. The current Reservation boundaries include approximately the southern one-third of Coeur d’Alene Lake and adjacent lands, and the lower reaches of the St. Joe River.
- As confirmed by the U.S. Supreme Court in 2001, the United States holds in trust for the Tribe the waters and submerged lands within those Reservation boundaries. Spokane River Project operations have profoundly impacted these Tribal trust resources as well as other related natural resources and ecosystems.

Effect of Post Falls Dam on Coeur d'Alene Lake and Spokane River Hydrology

- In typical years prior to construction of Post Falls Dam in 1906, Lake surface elevation peaked in late spring in response to snowmelt runoff and declined to its minimum level (determined by the elevation of the Spokane River outlet channel) by late summer.
- Post Falls Dam is operated to generate electricity and to hold the Lake level at approximately 2128 feet throughout the summer. In late summer and autumn water is released, thus providing more flow in the Spokane River than would otherwise be available at that time.

(This operational scheme greatly enhances the year-round capacity and reliability of the system of hydroelectric dams on the Spokane River.)

- Operation of Post Falls Dam artificially floods approximately 13,500 acres of low-relief lands adjacent to the Lake and lower reaches of the Coeur d'Alene and St. Joe Rivers with water up to 8 feet deep during the summer, a much longer period than would otherwise occur. Dam operation delays recession of the Lake to its minimum level by several months, which now typically occurs in late autumn.
- Of the approximately 13,500 acres directly inundated during the summer by Post Falls Dam, approximately 4,040 acres (30% of this area) are within the Coeur d'Alene Tribal Reservation.
- Evaporation from the increased surface area and transpiration from emergent aquatic plants growing in these shallow areas created by dam operation reduce total Lake outflow on an annual basis. This effect may be of ecological significance especially in years of very low streamflow.

Effects of Post Falls Dam Operation on Physical Features

- Post Falls Dam operation profoundly alters the physical features and characteristics of Coeur d'Alene Lake and adjacent near-shore areas. These effects are most apparent in the shallow, southern third of the Lake and lower reaches of the St. Joe River under Tribal ownership and jurisdiction.
- Holding the Lake at 2128 feet elevation during the summer creates large areas of shallow open water, allowing formation of larger wind-generated waves of greater energy acting over longer time periods that erode Lake shorelines, riverbanks and floodplains.
- Higher Lake levels during the summer create more opportunity for boating, and consequently more erosion at that level from boat wakes.
- Soils are saturated to a higher elevation for longer periods, profoundly altering near-shore and wetland plant communities and

killing or preventing regeneration of cottonwood trees and other soil-stabilizing vegetation, thus allowing further erosion.

- Several miles of natural levees confining the meandering channel of the lower reaches of the St. Joe River and associated lateral lakes, floodplains, and wetlands have disappeared due to the continued alteration of the natural processes that develop and sustain them.
- Similar changes occur at the heads of bays and other shallow or low-relief areas adjacent to the Lake, as well as in other tributaries and the lower reaches of the Coeur d'Alene River where mobilization and transport of toxic metals-contaminated sediments from historic mining and ore-processing activities are of particular concern.
- Continued physical changes can be expected for the foreseeable future, as near-shore areas, riverbanks, levees, floodplains and associated ecosystems continue to adjust to the altered hydrologic conditions of higher summertime Lake levels and delayed recession imposed by operation of the Post Falls Dam.

Environmental Effects of Post Falls Dam Operation on Coeur d'Alene Tribal Lands, Waters And Natural Resources

General Environmental Effects and Concerns

- Project operations have profoundly altered the distinct lateral lakes, diverse wetlands, floodplains, and fertile intermittently-flooded valley bottom lands of the lower St. Joe River and their associated ecosystems which once teemed with native cold-water fish, game, waterfowl, and edible and medicinal plants which sustained the Coeur d'Alene Tribe for millennia.

- For much of the year, these areas now are shallow, warm, open-water areas contiguous with the main body of Coeur d'Alene Lake or degraded wetlands or bare mud flats.

Specific Water Quality Effects and Concerns

- The additional 13,500 acres of shallow water areas created during the summer by Post Falls Dam operation warm sooner than deepwater areas, and significantly increase the overall volume of warm water in Coeur d'Alene Lake. Larger areas of the Lake now violate Tribal and State of Idaho regulatory criteria for temperature for longer periods throughout the year.

- These additional shallow areas are ideal habitat for emergent and submergent aquatic plants including non-native, invasive and nuisance species such as Eurasian water milfoil which Tribal researchers discovered growing in Tribal waters in 2004.
- Aquatic plant growth draws nitrogen, phosphorus and other nutrients from bottom sediments. When these plants die and decompose, dissolved oxygen in the water is consumed, and nutrients are released which contribute to further growth of plants and algae throughout the Lake. These effects are evident in the shallow southern portion of the Lake under Tribal ownership, where depletion of dissolved oxygen is frequently observed in late summer and early autumn.
- This process of eutrophication is of particular concern in Coeur d'Alene Lake because if Lake bottom waters become depleted in dissolved oxygen, geochemical reactions could promote the remobilization of toxic metals such as arsenic, cadmium, lead, and zinc from Lake bottom sediments contaminated by historic mining and ore-processing activities upstream in the South Fork Coeur d'Alene River mining district (which was largely powered by hydroelectricity from the Spokane River Project for much of the 20th century).
- One primary strategy under consideration for managing the metals-contaminated bottom of Coeur d'Alene Lake is to control nutrient inputs, thereby controlling the eutrophication process and its adverse effects of dissolved oxygen depletion and thus the mobilization of toxic metals from Lake bed sediments under anoxic conditions.
- The water quality effects of increased overall biological productivity in Coeur d'Alene Lake resulting from Post Falls Dam operation also have ramifications to ongoing, planned, or potential environmental remediation efforts throughout the Coeur d'Alene Lake/Spokane

River Basin[1], as well as to interstate nutrient load allocation and control efforts needed to manage and protect water quality downstream in the Spokane River and Lake Spokane.

Specific Aquatic Resource Effects and Concerns

- Project operations cause major changes to the flood pulse dynamics within the Project area by reversing the gradual recession of the natural hydrograph and inundating low-lying adjacent lands and tributaries to the Lake throughout the summer growing season. This effect creates habitat that sustains a thriving non-native fish community and an altered food web that negatively impacts west slope cutthroat trout, federally listed bull trout, mountain whitefish, and other native species. West slope cutthroat trout, bull trout and mountain whitefish are culturally significant resources of the Coeur d'Alene Tribe. Project operations have greatly reduced the ability of the Tribe to utilize those resources.
- Inundation and the resulting alteration of habitat preclude Tribal members from accessing habitat areas that were set aside for the exclusive use and occupancy of the Tribe. That has precluded traditional subsistence fishing in much of the Project area and prevents Tribal members from harvesting the adfluvial life history forms of the native salmonids.
- Declining numbers of native trout in the Lake and inundated riverine habitats restrict native fish management to species conservation characterized by slot limits, restrictive seasons, and catch and release regulations.
- More than 100 miles of habitat in lower river segments are annually converted to lacustrine habitats from mid-June to late September. The net effect of this inundation is the reduction and elimination of

[1] The Bunker Hill Superfund Site, upstream of Coeur d'Alene Lake, was added to the National Priorities List (NPL) in 1983. In February of 1998 EPA announced that it would study the full extent of pollution from mine waste in the entire 1,500 square mile Coeur d'Alene basin and Spokane River ecosystem. The CERCLA remedy and response timetable are ongoing."

thermal refuges that provide suitable habitat for native fish throughout the lower reaches of the tributaries to the Lake.

- The chronic, annual inundation of habitats produces approximately 13,500 acres of warm, productive rearing habitat for non-native fish species, including large predators that prey on native westslope cutthroat trout, mountain whitefish, northern pikeminnow, bull trout, and largescale sucker.
- Inundated riverine and Lake habitats alter thermal dynamics, nutrient cycling, plankton and invertebrate assemblages. This annual inundation by the Project creates habitats that support a food web consisting primarily of non-native species that compete with all life stages of native fish species for zooplankton and benthic invertebrates.
- Alteration of riverine and lacustrine habitats through inundation has a suite of behavioral effects on native species that result in truncation of reproductive, trophic and refuge migrations and avoidance of less suitable habitats created by Project operations. In combination with food web effects, this has the overall effect of decreasing production of native species throughout the Project area.

Specific Terrestrial Resource Effects and Concerns

- The quantity, timing and duration of inundation are greatly altered by Project operations. Operations affect the extent, distribution and function of approximately 18,100 acres of wetlands upstream of Post Falls Dam.
- The change from the natural hydrographic variation alters the dynamics of the system, and produces new conditions that are not all favorable to the native biota. Some plant and animal species that rely on the natural variation are displaced by species that are more tolerant of existing conditions.
- Populations of raptors, waterfowl, cavity nesting species, reptiles and amphibians, furbearers, big game and their associated life prerequisites are impacted by Project operations.
- Seasonal inundation causes a loss of diversity in wetland habitats in the Lake and tributaries. Emergent, scrub-shrub and forested

wetlands are being replaced by aquatic bed wetlands and shallow open water.

- Project operations encourage the spread of aquatic weeds. Available habitat for weeds is increased, and the spread of weeds is exacerbated by recreational boating.
- Proper function of the natural levees that exist in the Project Area is disrupted by Project operations. These levees are no longer self-sustaining and continue to be lost to erosion.

Specific Cultural Resource Effects and Concerns

Impacts to cultural resources cannot be fully assessed at this time. Archaeological and Traditional Cultural Property (TCP) studies are not complete and reports are not yet available.

Inundation

- Archaeological resources are obscured by inundation of lowlands in Project area. This includes portions of known village sites recorded by early anthropologists and missionaries.
- Archaeological survey of the Project area below 2128 feet of elevation is prevented during summer due to inundation by Project operations.
- Sediments are being deposited over archaeological resources by inundation of lower reaches of some waterways.
- Traditionally important plants such as water potato, camas, tule, and cottonwood are now absent or available in dramatically lower quantities in the Project area due to inundation of growing areas and change in seasonal levels of the Lake and lower reaches of the rivers caused by Project operations.
- Only five of the 16 identified culturally significant plant species are currently found within the boundaries of the Reservation, and only eight are found along the Lake and its tributaries. Many of the species appear to have very limited distributions throughout the Project area, and are particularly limited within the Reservation.
- Traditional fish trap sites are now located on slack water due to Project operations rendering them unproductive.

- Camps on the St. Joe River levees were used up until the 1940s when change in Project operations raised the level of inundation to 2128 feet elevation. This change inundates surrounding lowlands so that foot access to the levees across the lowlands is no longer possible and many of the area's resources are no longer present.

Erosion

- Due to Project operations, the St. Joe River's natural levees erode faster than they build. The levees have a high density of archaeological and other cultural resources.
- Archaeological site identification in the Project area is primarily by locating artifacts eroding out of the cutbank onto mudflats during the drawdown. This means cultural artifacts, sites and features are eroding away due to Project operations and the boat wake and wave action facilitated by the high summer water level.
- Archaeological site looters, "artifact collectors," are aware of the erosion pattern and routinely scour specific locations in periods of low water. On-going Project operations facilitate this archaeological site looting by regularly scheduled and located artifact deposition.

Development

- Development around the Lake and on riverbanks is structured for and dependent on the Project's maintenance of high summer Lake levels. Development buries, displaces and removes artifacts."

5.3.4 Fire

Fire was an integral part of the ecology of the forests of the Inland Northwest prior to European settlement. Based on information in the Tribe's Environmental Action Plan Assessment (EAP) report (Coeur d'Alene Tribe 2000b), fire was used by the Coeur d'Alene people as a means to renew and control growth of unwanted plants in huckleberry and root gathering areas and to keep campsite areas clear of growth. Fire was also used to promote growth of grass in the prairie areas. In pre-settlement days, frequent fires burned the open timber and meadows now occupied by agriculture. These fires maintained the grazing forage for wildlife and native plants for human use as well.

Wildfires have occurred in recent years across the Reservation but have been small in size and non-lethal, except for the fire of 1910, which burned thousands of acres on the Reservation. The most recent large wildfire occurred in 1968 near the town of Plummer, in which approximately 2000 acres burned.

Fire alters the physical makeup of a forest and grasslands by removing organic material, altering the species composition of trees and understory vegetation, and changing temperature regimes as a result of the physical alteration of the density of the tree and understory canopies. Chemical regimes are also changed by fire. Fire usually increases the availability of minerals such as calcium and magnesium. Fire also temporarily reduces total nitrogen on a site, but at the same time increases the available nitrogen in the soil (Agee 1993).

Frequent, low intensity surface fires at intervals between 2 and 25 years favored ponderosa pine as the dominant species, and open stand conditions for most of the western lowland forests. Fire regimes for the forests of the white pine/cedar/hemlock types were typically high intensity, stand replacement fires. These fires also occurred at longer intervals of perhaps 50 to 500 years (Agee 1993). These fires did not burn with equal intensity across the entire landscape, but instead left patchworks or mosaics of stands with varying species compositions, age classes, sizes, and understory vegetation. These fires, combined with some intermittent ground fires, favored shade intolerant species such as western white pine, western larch, ponderosa pine, and lodgepole pine. It could have favored Douglas-fir on some habitat types, such as those in the grand fir and subalpine fir series. The pre-settlement forest conditions described above are consistent with those associated with the fire regimes known to have occurred in northern Idaho.

Frequent, low intensity fires also tend to favor development of larger size classes and older trees. Smaller trees become established when enough overstory dies to create an opening and fire does not occur for a longer period. This results in a multi-aged stand structure. Longer fire frequencies favor ingrowth of shade-tolerant species and brush. Because of their higher burn intensity, they also result in much larger patches of relatively even-aged trees of various size classes across the landscape.

Frequent, low intensity fires burning over large acreages of the western lowland forests no longer occur. Except for those parcels converted to agricultural lands, the lack of fire affects nearly all of the remaining forestland of this type. These changes have contributed to the changes in species composition and density in the past 100 years.

The frequency of wildfires in the western lowland (primarily ponderosa pine) forests has been dramatically reduced since the establishment of the Reservation. As a result, the density of woody shrubs has increased, the amount of herbaceous ground cover has decreased and the total amount of woody fuels has increased. This has changed species composition to more shade-tolerant species and increased stand density in these areas, leading to greater risk of catastrophic fire, insect infestations and diseases.

Covering 193,465 acres of the Reservation, forested land is the most extensive ecosystem type on the Reservation (Coeur d'Alene Tribal G.I.S. 1998). The western lowlands and foothills were predominantly open ponderosa pine and Douglas-fir, with fingers of mixed grand fir, Douglas-fir, western larch, white pine and lodgepole pine in stream bottoms and protected slopes. Habitat types are primarily in the Douglas-fir and grand fir series with some intrusions of western red cedar and western hemlock (Daubenmire and Daubenmire 1968; Cooper, *et al*. 1991). These ecosystems are fire maintained ecosystems. Fire suppression and prescribed fire are a part of the Tribal Forest Management Plan and are implemented for ecosystem restoration.

The eastern mountains of the Reservation have a much moister environment and were covered with stands of mixed conifers including white pine, western larch, Douglas-fir, grand fir, western red cedar, and western hemlock. Scattered pockets and individual ponderosa pine trees were probably present on south and west slopes.

The highest elevation also includes subalpine fir, Engelmann spruce, and mountain hemlock. Habitat types are predominantly in the western hemlock, western red cedar, and subalpine fir series with a few mountain hemlock types at the highest elevations in the northeast corner of the Reservation. Fire is still an important element for restoration and nitrogen fixing.

A considerable amount of land within the Reservation has been converted from either forest or grassland to agricultural land since the turn of the century. Agricultural land is a human dominated or created ecosystem type and, unlike the others, was not present prior to settlement. In 1998 it was estimated that 135,828 acres of land within the Reservation were used for agriculture (Coeur d'Alene Tribal G.I.S. 1998). This includes all of the potential native grasslands that existed in the western portion of the Reservation. Blue grass, wheat and legumes are the three main crops produced on the Reservation. Some of this area is burned yearly. Fire is important in these agricultural settings for control of non-native species and nitrogen and chemical enhancement of the soils.

5.3.5 Fish

"Going up the Columbia River, it was Coyote who released the Salmon and other Fish Peoples trapped by the Swallow Sisters at Celilo Falls. The camas and fish would help nourish and the pitch help warm those who would be coming" (Frey and the Schitsu'umsh 2000).

The desired future conditions for fisheries in the Tribe's aboriginal territory is to provide for sustainable, naturally producing populations of native fish that support Tribal and non-Tribal harvests and also provide for ecological, cultural, economic, recreational, and aesthetic benefits to the region.

The following describes the current status of fisheries populations and species diversity on the Reservation. This information was summarized from numerous studies conducted on the Reservation, including the Supplementation Feasibility Report (Peters, *et al.* 1998), fish habitat and population evaluations of Coeur d'Alene tributaries (Lillengreen, *et al*. 1993,1994, and 1996), Lake and Plummer Creek Watershed Assessments and Monitoring Reports (Coeur d'Alene Tribe 1998b; Krueger 1998c), the Coeur d'Alene Subbasin Summary (Northwest Power and Planning Council 2004) and several Hangman Creek assessments (Idaho Department of Health and Welfare 1989–1990 and 1991; Spokane County Conservation District and Washington Department of Ecology 1994).

Fourteen native fish species and fourteen introduced exotic fish species (Simpson and Wallace 1982) are currently found within the Tribe's aboriginal territory (Table 5.3.5.1)

Table 5.3.5.1. Fish Species of the Coeur d'Alene Subbasin.

Common Name	*Scientific Name*	*Location**	*Native***
Black bullhead	*Ictalurus melas*	L	No
Black crappie	*Pomoxis nigromaculatus*	L	No
Bridgelip sucker	*Catostomus columbianus*	L	Yes
Brook trout	*Salvelinus fontinalis*	Ri	No
Brown bullhead	*Ictalurus nebulosus*	L	No
Bull trout	*Salvelinus confluentus*	B	Yes
Channel catfish	*Ictalurus punctata*	B	No
Chinook salmon**	*Oncorhynchus tshawytscha*	B	Yes
Kokanee	*Oncorhynchus nerka*	L	No
Lake whitefish***	*Coregonis clupeaformis*	L	No
Largemouth bass	*Micropterus salmoides*	L	No
Largescale sucker	*Catostomus macrocheilus*	L	Yes
Longnose dace	*Rhinichthys cataractae*	Ri	Yes
Longnose sucker	*Catostomus catostomus*	B	Yes
Mountain whitefish	*Prosopium williamsoni*	B	Yes
Northern pike	*Esox lucius*	B	No
Northern pikeminnow	*Ptychocheilus oregonensis*	B	Yes
Pumpkinseed	*Lepomis gibbosus*	L	No
Redband trout**	*Oncorhynchus mykiss gairdneri*	Ri	Yes
Redside shiner	*Richardsonius balteatus*	Ri	Yes
Shorthead sculpin	*Cottus confusus*	Ri	Yes
Smallmouth bass	*Micropterus dolomieui*	L	No
Speckled dace	*Rhinichthys osculus*	Ri	Yes
Tench	*Tinca tinca*	L	No
Tiger muskie	*Esox masquinongy x E. lucius*	B	No
Torrent sculpin	*Cottus rhotheus*	Ri	Yes
Westslope cutthroat trout	*Oncorhyncus clarki lewisi*	B	Yes
Yellow perch	*Perca flavescens*	L	No

* L -Lake, Ri - River, B - Both

*** Chinook Salmon and Redband Trout were historically present in Hangman Creek and its tributaries only.*

**** Field observation by Coeur d'Alene Tribe Fisheries staff.*

Samuel and Marcus Harding and Tim Wolfe holding up their catch (photo by Dee Bailey).

Widespread changes in land-use patterns have caused the decline of many of the more sensitive native species. Of the species native to the Reservation, two are now locally extirpated from their native habitats, one is listed as threatened, one is listed as a species of special concern, and the status of another is uncertain. Habitat degradation and the construction of hydroelectric dams on the Columbia River System caused the loss of the Chinook and steelhead sub-populations in Hangman Creek. (Chinook have subsequently been stocked in Coeur d'Alene Lake by the Idaho Department of Fish and Game and are managed as an introduced game fish.). Bull trout have been listed as a threatened species in the Coeur d'Alene system under the Endangered Species Act. Recent surveys suggest that bull trout have become essentially extirpated from the Coeur d'Alene River system and from other low elevation tributaries to the Lake. Comparison of historic and current distribution data for the St. Joe River system suggest bull trout may have been more widespread in the past. Within their native range, populations of westslope cutthroat trout have been declining region-wide and they are a species of special concern to the Tribe and the State of Idaho. The U.S. Fish and Wildlife Service has considered the westslope cutthroat trout for listing under the Endangered Species Act as recently as 1999. The status of native redband trout (thought to be a subpopulation of rainbow trout) in the Hangman watershed has not been fully determined, but distribution is thought to be greatly reduced compared with their historic range (Coeur d'Alene Tribe unpublished data).

Mountain whitefish are one of the most abundant and widely distributed native game fish in the Coeur d'Alene subbasin. Strong populations are found in riverine habitats of the Coeur d'Alene, St. Joe, and St. Maries rivers. Recent surveys indicated that mountain whitefish were the dominant game fish captured in electrofishing samples from the Coeur d'Alene, St. Joe, and St. Maries rivers (Apperson *et al.* 1987). Although mountain whitefish were found primarily in mainstem reaches of large rivers, their presence was also noted in several smaller tributaries to the St. Joe and St. Maries rivers.

Historically, westslope cutthroat trout were the dominant salmonid in streams of the Coeur d'Alene basin (Behnke and Wallace 1986). There is little data documenting historic abundance of westslope cutthroat trout, but densities were probably high throughout the basin. There are three distinct life history types of native trout in the Basin: resident, fluvial, and adfluvial. The resident trout spend their entire life cycle within the smaller tributaries. The fluvial stock originates in the smaller tributaries and then migrates to the larger streams like the St. Maries, St. Joe, and Coeur d'Alene Rivers. Once they reach sexual maturity (4-6 years), they return to the tributaries to spawn. The adfluvial stock spends one to three years in the tributaries and then migrates to the open waters of the lake to feed and mature. Upon reaching maturity, they return to the tributaries to spawn. All of these life history forms of westslope cutthroat and bull trout have experienced substantial declines in their distribution and abundance within the Coeur d'Alene system (Table 5.3.5.2.)

Table 5.3.5.2. Historical and Current Range for westslope cutthroat trout.

Historical range occupied (%)	*Occupied range classified as strong (%)*	*Assessment Area*	*Source*
65	*0*	*CDA Reservation*	*Coeur d'Alene Tribe*
82	*11*	*Idaho*	*Reiman/Apperson (1989)*
85	*25*	*Interior Columbia Basin*	*ICBEMP (USFS/BLM)*

Studies conducted by the Coeur d'Alene Tribe have documented viable populations of westslope cutthroat in Lake, Alder, Evans, and Benewah Creeks. However, they also reported the presence of non-native brook trout in Benewah and Alder Creeks. Brook trout may compete with the cutthroat for food and limited space in these drainages. The following summarizes the fish population data for those Reservation streams, which were inventoried from 1992 to 2001.

Lake Creek Lake Creek discharges into Coeur d'Alene Lake at Windy Bay and has been studied intensively by the Tribe and others (Lillengreen, *et al.* 1993, 1994, 1996; Peters *et al.* 1998; U.S. Department of Agriculture Soil Conservation Service 1991). Studies have documented the abundance and distribution of fishes in the watershed, the migratory life histories of cutthroat trout, characteristics of macroinvertebrate populations, and described general habitat features.

The mean annual density of cutthroat trout has ranged from 3.5-8.3 fish/100 square meters. The population estimates calculated from annual sample efforts reveal the consistent higher density of westslope cutthroat trout in tributary reaches compared to mainstem reaches. This is thought to be primarily a function of high water temperatures in these mainstem reaches. Cutthroat densities were greatest in plunge pool habitat and lowest in dammed pool and glide habitats (Lillengreen *et al.* 1996). The growth rates and condition factors for cutthroat trout were comparable to other streams in north Idaho (Lillengreen, *et al.* 1993). Electrofishing samples from the spring, summer, and fall displayed the following species composition and relative abundance in Table 5.3.5.3 (Lillengreen *et al*. 1996).

Table 5.3.5.3 Species Abundance in Lake Creek.

Species	*Spring (%)*	*Summer (%)*	*Fall (%)*
Cutthroat Trout	15.1	32.7	6.9
Sculpin spp.	60.4	18.2	35.3
Longnose Sucker	20.8	25.4	25
Redside Shiner	3.8	16.4	32.8
Western Speckled Dace	—	7.3	—

Incidental observations of adult and sub-adult bull trout have been made in the watershed in recent years but no spawning has been documented and bull trout usage of the watershed is probably limited.

Migration patterns of trout have been studied in Lake Creek since 1994. Migration trap data indicated that Lake Creek supports remnant populations of adfluvial (migratory) and resident westslope cutthroat trout. The exact size of adfluvial runs is difficult to estimate because of inefficiencies in trapping fish. However, 1994 represents a typical year; of a total catch of 698 fish, 99% were cutthroat trout. It was believed that most of these fish were of adfluvial stock (*i.e*., spawn in streams, migrate to the lake to rear and mature). The upstream migration of cutthroat trout in the Lake Creek drainage was concentrated within the period from March 20 to April 23 and downstream migration typically occurs throughout this period and into early June. Analysis of the age class structure showed that age 2+ and 3+ fish were the most abundant age classes (Lillengreen, *et al*. 1996). Adult fish (Age 4+) have comprised 11% of the total run size on average.

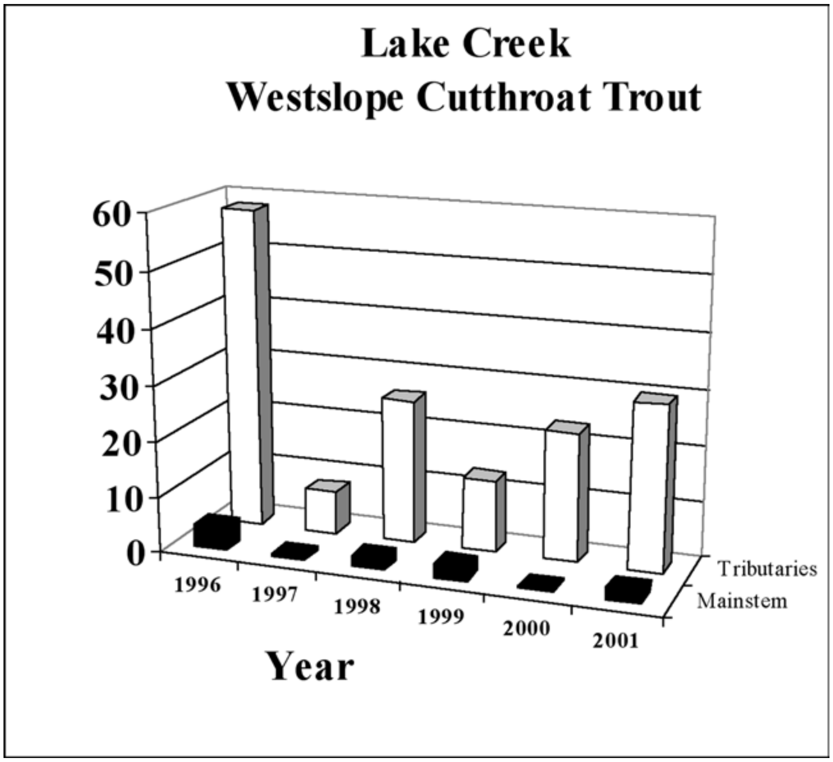


Table 5.3.5.4 Mean Westslope cutthroat trout density in Lake Creek and its tributaries.

The observed densities of macroinvertebrates in the watershed were generally comparable or greater than those observed in other similar streams in north Idaho, but were substantially lower compared to other streams studied on the Reservation (Lillengreen *et al.* 1996). Invertebrate diversity (as measured by the Shannon-Weiner Index) was also lower in Lake Creek.

Lillengreen, *et al.* (1996) concluded that the cutthroat trout population in Lake Creek includes both the resident and adfluvial life history types. They further concluded that cumulative impacts from land uses to the hydrology and habitat of the system were limiting the production of the cutthroat trout. The investigators postulated that habitat limiting factors included: high summer water temperatures in mainstem reaches; and cumulative silt loading over time that had resulted in poor pool frequency and loss of overwintering and rearing habitats. The proportion of fine sediment in stream gravels was much higher in Lake Creek tributaries than in four other watersheds that were studied. Only in the mainstem of Lake Creek were the proportions of both small and coarse fines considered above the levels for these particle sizes (10% and 30%, respectively) shown to adversely affect salmonid emergence success (Vitale et al. 1999).

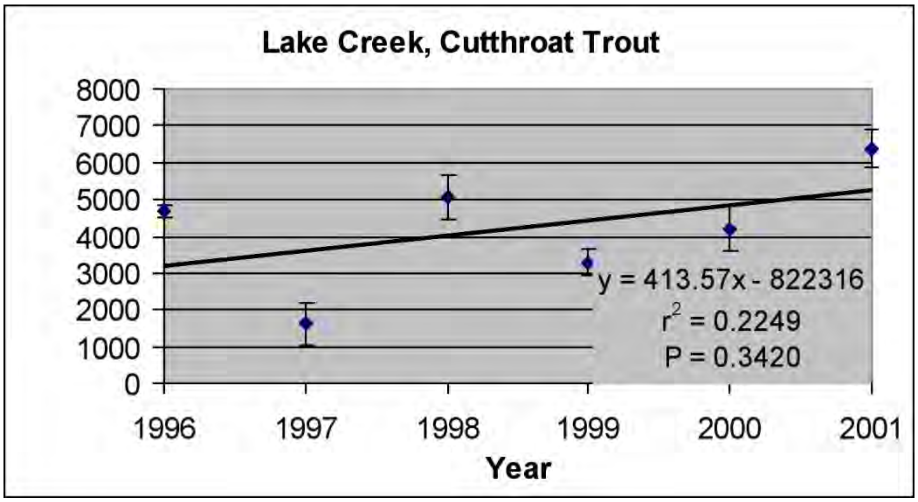


Table 5.3.5.5 Lake Creek Cutthroat Populations. Total estimated number of cutthroat trout (N) in the Lake Creek watershed, 1999–2001. Error bars indicate 95% confidence intervals for annual population estimates.

During recent years, 1996-2001, total estimated numbers of cutthroat in the watershed have shown an increasing trend although this trend is not statistically significant. This trend is thought to be a positive response to fishing regulations that closed the cutthroat trout fishery beginning in 1993. Restoration and enhancement efforts that have been underway since 1996 have the potential to improve local habitat and water quality conditions, but it may take another generation (7–8 years) to provide measurable benefits to fish populations.

Plummer Creek Plummer Creek flows into Chatcolet Lake, and has been heavily impacted by land and other resource uses. Major factors limiting trout production in the stream are: lack of quality spawning, rearing, and overwintering habitats. The system is degraded with low base flows, high water temperatures, high silt loads, and passage (barrier) problems.

In 1991, electrofishing surveys indicated the fish community was dominated by dace (81.3%). Of the 833 fish captured, only 4 (0.5%) were cutthroat and 5 (0.6%) were eastern brook trout. The remaining 147 fish consisted of sculpin, redside shiners, longnose suckers and northern pikeminnow. Anecdotal reports claim harvest of large adult cutthroat trout in both Plummer and Little Plummer Creek as recently as the late 1970's (Matt 1998). Tribal biologists concluded that Plummer Creek receives little utilization by salmonids as a consequence of the poor habitat conditions. They stated that appreciable improvements in upland erosion, riparian vegetation, and water quality would need to take place before salmonid utilization can be expected (Krueger 1998c).

Benewah Creek Benewah Creek is a fourth order stream that drains into Benewah Lake. It has been studied by Lillengreen *et al*. (1996) who reported that the major limiting factors for salmonids were: lack of riparian vegetation, low base flows, unstable stream banks, high water temperatures, and high siltation rates. These impacts further translated to channel instability, low pool quality, low habitat diversity, and reduced channel capacity.

Fish population surveys (Lillengreen, *et al.* 1996) conducted in 1993 and 1994 revealed that the fish community consisted of (Table 5.3.5.6):

Table 5.3.5.6 Benewah Creek Fish Populations.

Species	*1993 (%)*	*1994 (%)*
Cutthroat Trout	11	2.8
Eastern Brook Trout	0.1	—
Rainbow Trout	0.3	—
Sculpin species	7	11.2
Largemouth Bass	0.3	—
Longnose Sucker	18.3	13.7
Longnose Dace	10.4	—
Speckled Dace	5.1	1.8
Brown Bullhead	0.3	—
Redside Shiner	45.9	72.2
Northern Pikeminnow	1.1	0.2

The cutthroat trout stock includes adfluvial as well as resident life history types.

Sampling of macroinvertebrates in Benewah Creek showed that diversity was the highest among the tributaries studied on the Reservation, and densities were comparable to similar streams in north Idaho.

The mean annual densities of cutthroat and brook trout have ranged from 2.5-3.5 fish/100 square meters and 0.2-0.8 fish/100 square meters, respectively. The population estimates calculated from annual sample efforts reveal the consistent higher density of westslope cutthroat trout in tributary reaches compared to mainstem reaches (Table 5.3.5.7). This is thought to be primarily a function of high water temperatures in these mainstem reaches.

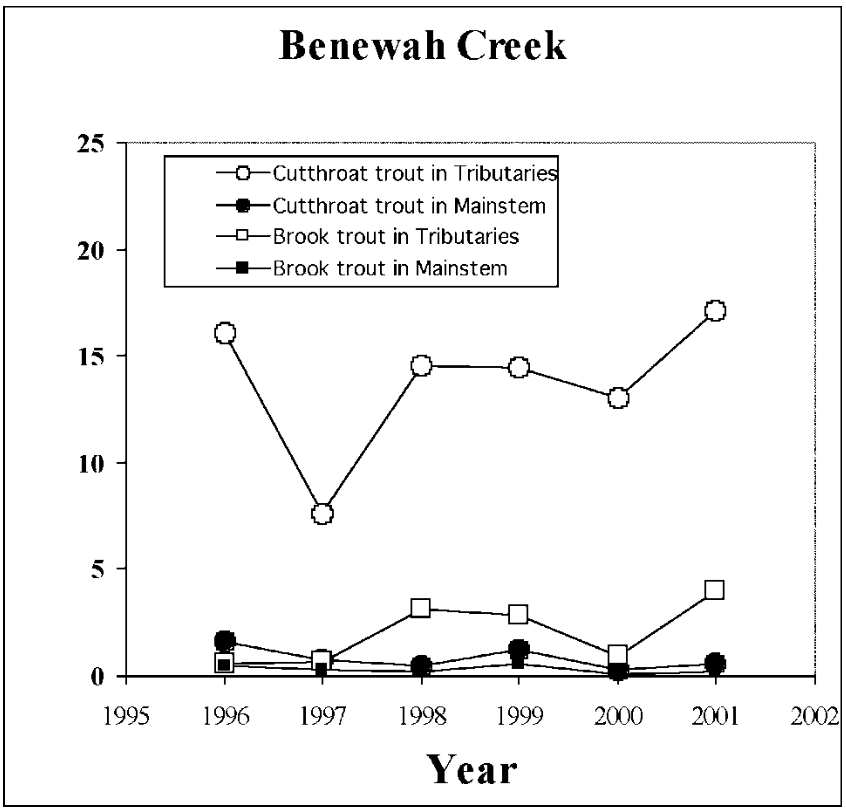


Table 5.3.5.7 Comparison of Eastern brook trout and westslope cutthroat trout densities in Benewah Creek.

During recent years, 2002-2008, estimated abundances across most of the sampled sites in the upper Benewah watershed were typically greater than the 5-6 year average and displayed strong positive trends over the last four years.

This trend is thought to be, in part, a positive response to fishing regulations that closed the cutthroat trout fishery beginning in 1993. Also restoration and enhancement efforts that have been underway since 1996 have improved local habitat and water quality conditions that have been linked to the suitability of salmonid rearing habitat. Though a numerical response of cutthroat trout in mainstem reaches to restoration has not been observed, tributary trends over the past three years may suggest an indirect response to mainstem habitat improvements and there is some evidence that juvenile fish are beginning to redistribute downriver from upriver tributary sources.

Alder Creek Alder Creek is a fourth order tributary to the St. Maries River. The St. Maries River is a principal tributary of the St. Joe River which discharges into Coeur d'Alene Lake. Again, Alder Creek has been studied extensively by Tribal scientists (Lillengreen, *et al.* 1996; and Peters, *et al.* 1998). Alder Creek has been subjected to land uses and adverse effects similar to the other study watersheds. Cumulative impacts have taken their toll. Consequently, the stream displays similar habitat conditions of: low pool frequency and quality; low canopy cover; low levels of large woody debris; sub-optimal habitat type diversity; and high substrate sediment.

Fish population studies revealed that the composition of cutthroat trout in the catch did not vary substantially during the spring, summer, and fall sampling periods, at 24.2%, 20.8%, and 25.4% respectively. Non-native brook trout were present in higher numbers and composition, at 42.4%, 48.8%, and 34.7% respectively. Sculpins and longnose suckers made up the remainder of the community.

The brook trout population is significantly larger than the cutthroat trout population in Alder Creek and there is a significant trend of increasing brook trout abundance and decreasing cutthroat abundance in recent years. The pattern of distribution in Alder Creek indicates that cutthroat trout are not utilizing the optimal habitat found in tributaries, yet brook trout are found in these same habitats at densities that typically exceed 15 fish/100 square meters (Table 5.3.5.8).

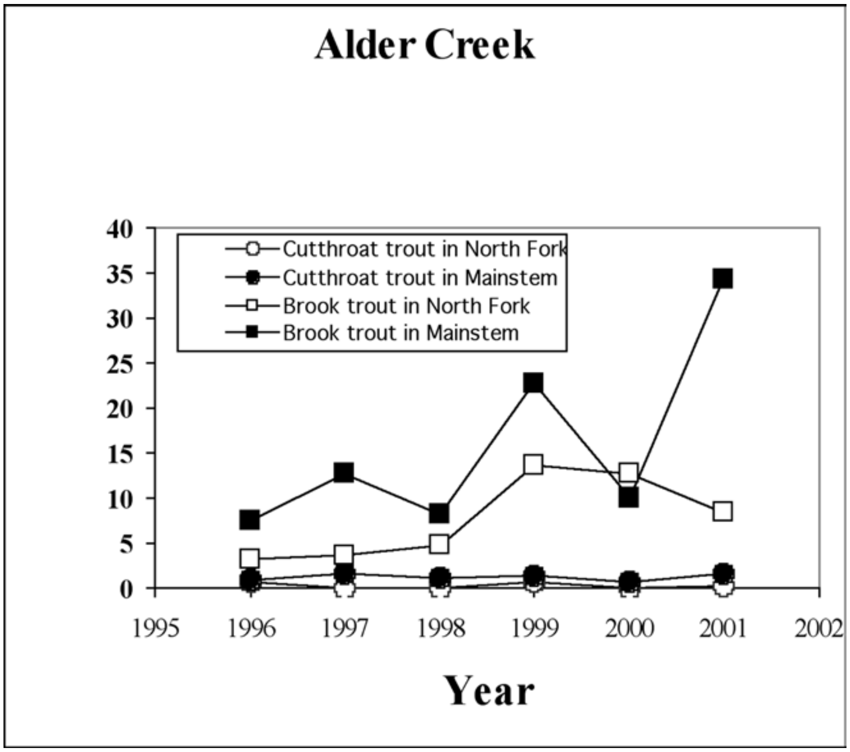


Table 5.3.5.8 Comparison of Eastern brook trout and westslope cutthroat trout density in Alder Creek.

Macroinvertebrate densities and indices of diversity were generally comparable to the other target tributaries (Lillingreen, *et al.* 1996).

Evans Creek Evans Creek deserves special reference. Among the target tributaries studied by the Tribe, Evans Creek displayed the highest overall densities of cutthroat trout (Lillingreen, *et al.* 1996). Density estimates reported by Lillengreen *et al*. (1993) ranged from 9.0 to 24.1 fish/100 square meters. A mean density of 8.2 fish/100 square meters is considered comparable to other Idaho streams in optimum condition (Lillengreen *et al.* 1996). There has been a general trend of increasing numbers of cutthroat in the watershed since 1996 (Table 5.3.5.9). The cutthroat trout in the watershed are believed to be primarily a resident fish stock.

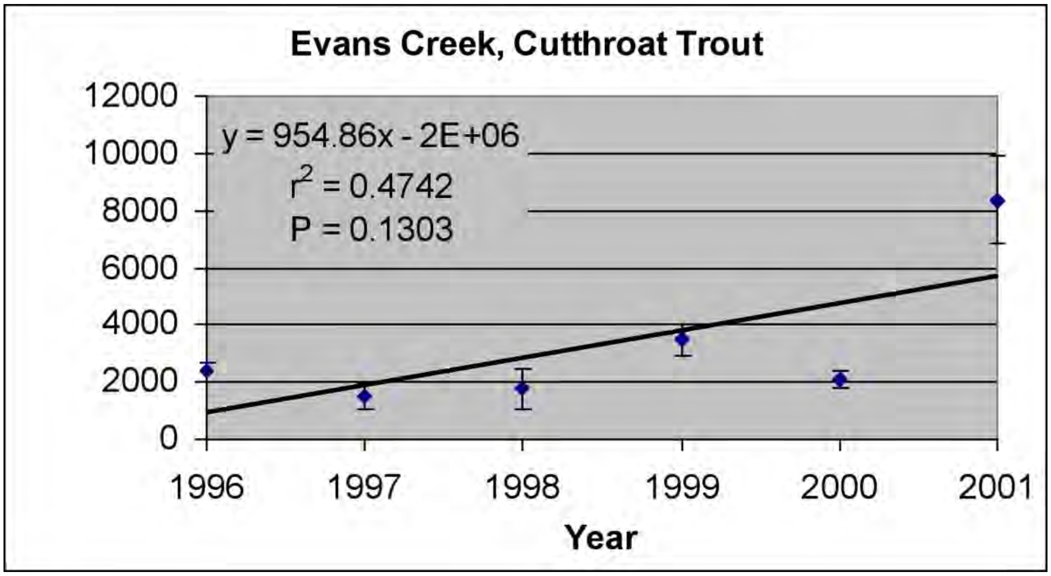


Table 5.3.5.9 Total estimated cutthroat trout numbers in the Evans Creek watershed, 1999–2001. Error bars indicate 95% confidence intervals for annual population estimates.

With the exception of the lower reach, Evans Creek has not been subjected to the severe cumulative land use impacts that the other tributaries have. Livestock grazing in the lower reach has degraded spawning and rearing habitats in Evans Creek.

Coeur d'Alene Lake Peters, *et al.* (1998) have studied the lake and some of its key tributaries for cutthroat trout suitability. They sampled the fish populations and investigated a number of habitat and water quality parameters. Their estimates of relative abundance derived from electrofishing in the lake showed that 61.9% of the catch consisted of introduced species, with yellow perch and largemouth bass being the most abundant. Native fish comprised only 38.1% of the catch with largescale suckers being the most abundant. Cutthroat trout made-up only 0.83% of the catch from 1994-97 (Peters, *et al.* 1998). Gillnet sampling essentially corroborated the results obtained via electrofishing. The data show that nine species of fish were more abundant than cutthroat trout lake-wide.

Peters, *et al.* (1998) concluded that, on the basis of their data and habitat modeling, the upper 10 meters of the water column in the lake is generally not suitable habitat for cutthroat trout during the warmest part of the year. They attribute this to sub-optimal (high) water temperatures in this zone. Results from their water quality modeling indicate that there is suitable habitat for cutthroat in the lake; however, the quantity of the suitable habitat decreases as water temperatures increase during the year. While this condition does not directly exclude the cutthroat trout from the shallow areas (littoral zones), unsuitable habitat may exert additional stress when cutthroat make foraging runs in this zone (Peters, *et al.* 1998). The investigators concluded that water quality is still having a detrimental effect on habitat suitability for cutthroat trout despite recent improvements in the lake.

Introduced non-native fishes pose a major threat to native species in Coeur d'Alene Lake. Several recent studies of predator diets substantiate these claims (Rich 1992; Coeur d'Alene Tribe 2003). Northern pike are clearly substantial predators of cutthroat trout in Coeur d'Alene Lake. Pike are consuming a wide range of sizes of cutthroat, implying that they probably eat cutthroat throughout the year rather than just young fish shortly after they first enter the lake habitat. The presence of cutthroat trout as a major prey item in these ambush predators is an indication that cutthroat tend to be present in moderately shallow shoreline areas of Coeur d'Alene Lake. Only a single pike was collected from the pelagic zone in the Tribe's study. Chinook salmon are also a substantial predator of cutthroat trout. However, the available data indicate they prey only on those smaller cutthroats that have recently entered the lake habitat. The data from these studies provide a clear indication the largemouth bass, smallmouth bass, and northern pikeminnow are not substantial predators of cutthroat trout in Coeur d'Alene Lake. The sample sizes examined for these species are sufficiently large to support a firm conclusion.

Peters, *et al.* (1998) felt that cutthroat trout experience the highest rates of predation in the littoral zone habitat where densities of northern pike and other introduced species is highest. It is in the littoral zones that problems with temperature and inter-specific interactions are maximized. There is some relief from temperature stress in the open water, deeper areas (limnetic) of the lake, but not from the presence of other species that may compete with or prey on the cutthroat.

Hangman Creek According to historical accounts, Hangman Creek "was a clear stream, frequented by anadromous salmon (Marion 1952)." Chinook salmon and Steelhead were native to the Hangman Creek system, including the Reservation portion, but have been locally extirpated. Bull trout may have also used habitats of Hangman Creek; there is some mention of bull trout in the headwater areas; however, no known collections have been made to date (Spokane County Conservation District and Washington Department of Ecology 1994).

Hangman Creek is a fourth order stream of the Spokane River drainage and sustained anadromous fish prior to the construction of dams on the Columbia River system. This watershed has suffered severe cumulative impacts from land management practices, primarily agriculture and forestry. Fish biologists who have studied the watershed concluded that the system currently has little potential for sustaining salmonid fishes and other cold water biota. Low base flows and high water temperatures critically restrict cold water fauna and their designated beneficial uses. Some potential does exist in the upper reaches (headwaters) of the system. Data from 1994 shows the fish community to be dominated by bullhead, redside shiners, and dace. Other species found in the watershed are: tench; sculpins (spp.); suckers (spp.); yellow perch; chiselmouth; northern pikeminnow; brown, brook, and rainbow trout (Spokane County Conservation District and Washington Department of Ecology 1994). Brown and brook trout are exotic species which are aggressive competitors with, and predators of, native trout species.

As part of a three-year bioassessment on Hangman Creek, results in 2003 reveal that rainbow trout reside in the upper reaches and tributaries of Hangman Creek. Very little is known about the migratory habits of these fish or their genetic origin. Rainbows in Indian Creek exhibit many of the phenotypic (physical) characteristics of Redband trout *(Oncorhynchus mykiss gairdneri)*, the native subspecies of rainbow. A healthy population of cutthroat trout *(Oncorhynchus clarki lewisi)* also resides in the forested areas of Nehchen Creek. Residents planted these fish from Benewah Creek stocks during the 1980's. More information on the genetic origin and migration patterns will become available after DNA analysis reports and migrant trapping data become available. Specked Dace *(Rhinicthys osculus)* and Redside shiners *(Richardsonius balteatus)* dominated stream reaches within agricultural areas. Other fish sampled include Longnose suckers *(Catostomas catostomas)* and sculpin (*Cottus* spp.).

5.3.6 Forest

As stated earlier in the Fire section 5.3.4, nearly all of the Coeur d'Alene Reservation was originally forested. Approximately 114,411 acres of forest, shrub and grasslands were converted to agriculture and other non-forest uses and no longer support their native forest, shrub and grassland vegetation. Most of the remaining forest land on the Reservation has been impacted by forestry practices, exclusion of fire, and introduction of exotic species. Nearly all of the remaining western lowland forest has been logged at least once, and in some instances three and four times since establishment of the Reservation.

White pine blister rust, Western larch casebearer, introduced noxious weeds, and other introduced plants are present and permanently established at varying frequencies throughout all of the forests within and near the Reservation. White pine blister rust has impacted all areas supporting this species, including the 1,647 acres of the Grassy Mountain Reserve.

Blister rust has eliminated much of the naturally regenerated white pine from the forests of the Reservation, and surrounding areas. There are still many individual trees that either escaped infection or are genetically resistant to the disease. The main result of the loss of white pine was a shift in the conifer species composition to a predominance of Douglas-fir and grand fir where white pine had been a major stand component. Blister rust has also indirectly contributed to the widespread occurrence of active root diseases in Douglas-fir and grand fir. This is due to the reduction of white pine, which is less susceptible to root rot, and, hence, allowing substantial increases in these two more susceptible species.

Currently, the impacts of the Western larch casebearer are small. The introduced parasitic wasp is keeping the casebearer populations in check, but defoliation of western larch by the casebearer continues.

Grazing impacts on areas still forested are extremely variable and dependent on the number of animals, type of animals, and season of use.

The severity of effects on the forest environment by introduced plant species is not fully known. The presence of the non-native species in the forest, however, indicates that native vegetation has been displaced to one degree or another. In some areas all of the native vegetation has been replaced by meadow hawkweed (St. Amand 1998). The same is true for spotted knapweed on dry ponderosa pine sites. Abundance of some native forest plant species, and the wildlife associated with them, may be permanently reduced by the presence of these and other non-native plants.

The *Coeur d'Alene Forest Management Plan 2003-2017* (Coeur d'Alene Tribe 2002b), the *Forest Management Plan Environmental Assessment* (Coeur d'Alene Tribe 2002a), the *Inventory Analysis of the 1997–98 Continuous Forest Inventory* (Coeur d'Alene Tribe 1998a) and the *The Forests of the Coeur d'Alene 1855-1991* (Babcock and Schuttler 1991) are available at the Coeur d'Alene Tribe's Forestry Program for additional information about the forest Table 5.3.6.1 contains a list of the forested habitat types on the Coeur d'Alene Reservation.

Table 5.3.6.1 Forested Habitat Types Identified on the Coeur d'Alene Reservation (Cooper, *et al.* 1991).

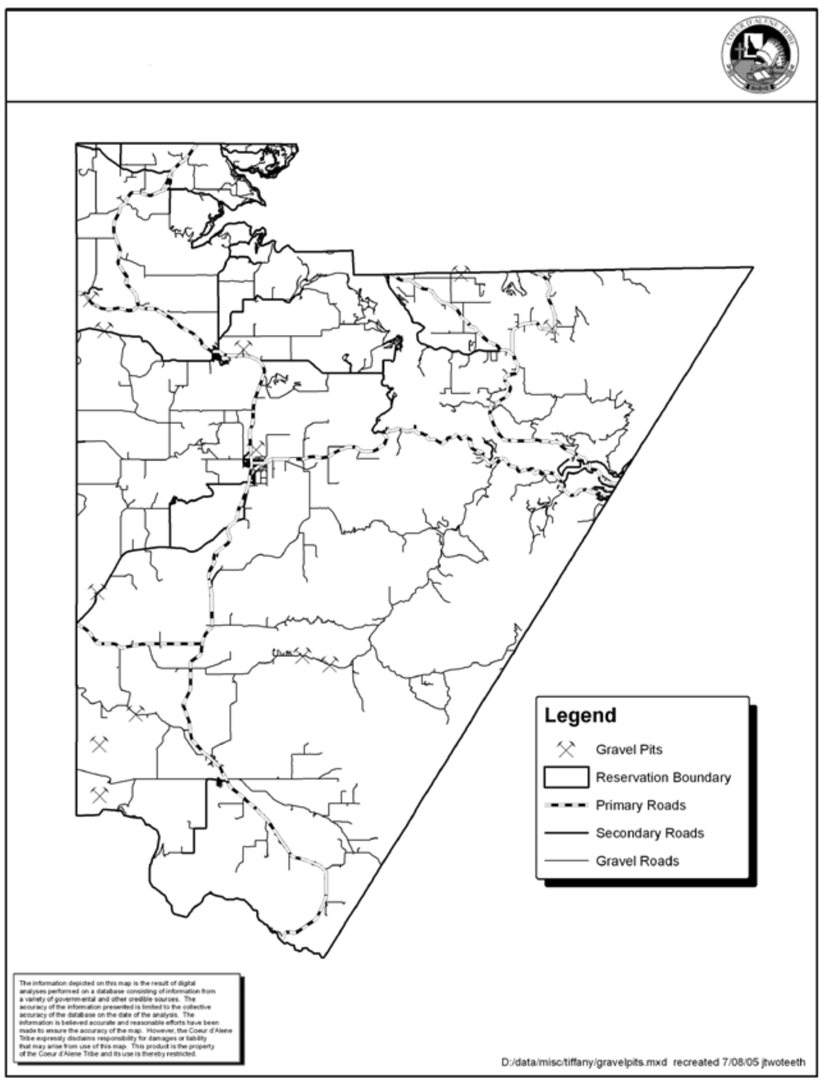
Grand Fir/ninebark	Western Hemlock/queencup beadlily
Grand Fir/beargrass	Western Hemlock/wild ginger
Grand Fir/queencup beadlily	Western Hemlock/menziesia
Western red cedar/lady-fern	Grand Fir/twinflower
Western red cedar/ wild ginger	Subalpine fir/queencup beadlily
Western red cedar/devils club	Mountain Hemlock/menziesia
Western red cedar/maidenhair fern	Subalpine fir/beargrass
Western red cedar/queencup beadlily	Mountain Hemlock/beargrass
Douglas-fir/ninebark	Douglas-fir/pinegrass
Douglas-fir/common snowberry	Ponderosa pine/ninebark
Douglas-fir/white spiraea	Ponderosa pine/common snowberry

Larry LaSarte planting trees (photo by Kurt Mettler).

5.3.7 Minerals

The IRMP does not assess the impact of historic mining and/or milling activities on or near the Coeur d'Alene Reservation or the Coeur d'Alene River. The Natural Resource Damage Assessment being undertaken by the Tribe and the United States is addressing mining- and/or milling- related resource impacts independent of the IRMP.

A map of existing aggregate mining sites (gravel pits) is included below (Figure 5.3.7.1, Gravel Pits).



5.3.8 Riparian Areas

The riparian zones on the Reservation support some of the most productive and diverse plant and animal communities due to the abundance of water, forage and cover. They also serve as transitional areas between aquatic and upland areas that connect different habitats. Riparian habitats have been altered from historic conditions by deforestation, grazing and flood control. These impacts have shifted the vegetation to an early successional stage, and have allowed the colonization of exotic plant species in many cases. Native plant species that are found in riparian zones range from cottonwood, willow, aspen and alder in the overstory, to red-osier dogwood, willow and douglas spirea in the shrub layer.

Six lakes lie within the Coeur d'Alene Reservation. Coeur d'Alene Lake is the largest lake in the study area, and the second largest in Idaho. Coeur d'Alene Lake drains an area of approximately 3670 square miles (Lillengreen, *et al.* 1993). It lies in a naturally constricted river valley with the outflow seasonally controlled by the Post Falls Dam. The St. Joe and the Coeur d'Alene Rivers are the two main drainage basins emptying into Coeur d'Alene Lake (collectively 91% of the Lake's drainage area). The remaining 9% of the drainage basin consists of creeks flowing into Wolf Lodge Bay on the east side of the lake, and Windy, Rockford, Mica and Cougar bays on the west side of the lake (Lillengreen, *et al.* 1993).

Hidden, Round, Chatcolet, Benewah and Hepton Lakes are all located at the Southern end of Coeur d'Alene Lake. These lake levels remain high throughout the summer and fall due to the Post Falls Dam (Peters, *et al.* 1998). Half of Black Lake, which is part of the Coeur d'Alene River flood plain, is also within the Reservation. All of these lake complexes have varying compositions of riparian vegetation and attributes.

The Coeur d'Alene Reservation has a variety of different river and stream systems within its boundaries. Two main drainage basins exist on the Reservation; the Hangman Creek watershed, which drains off of the Reservation and into the Spokane River, and the Coeur d'Alene Lake drainage. Below is a description of the watersheds on the Reservation and the corresponding riparian areas (Figure 5.3.8.1).

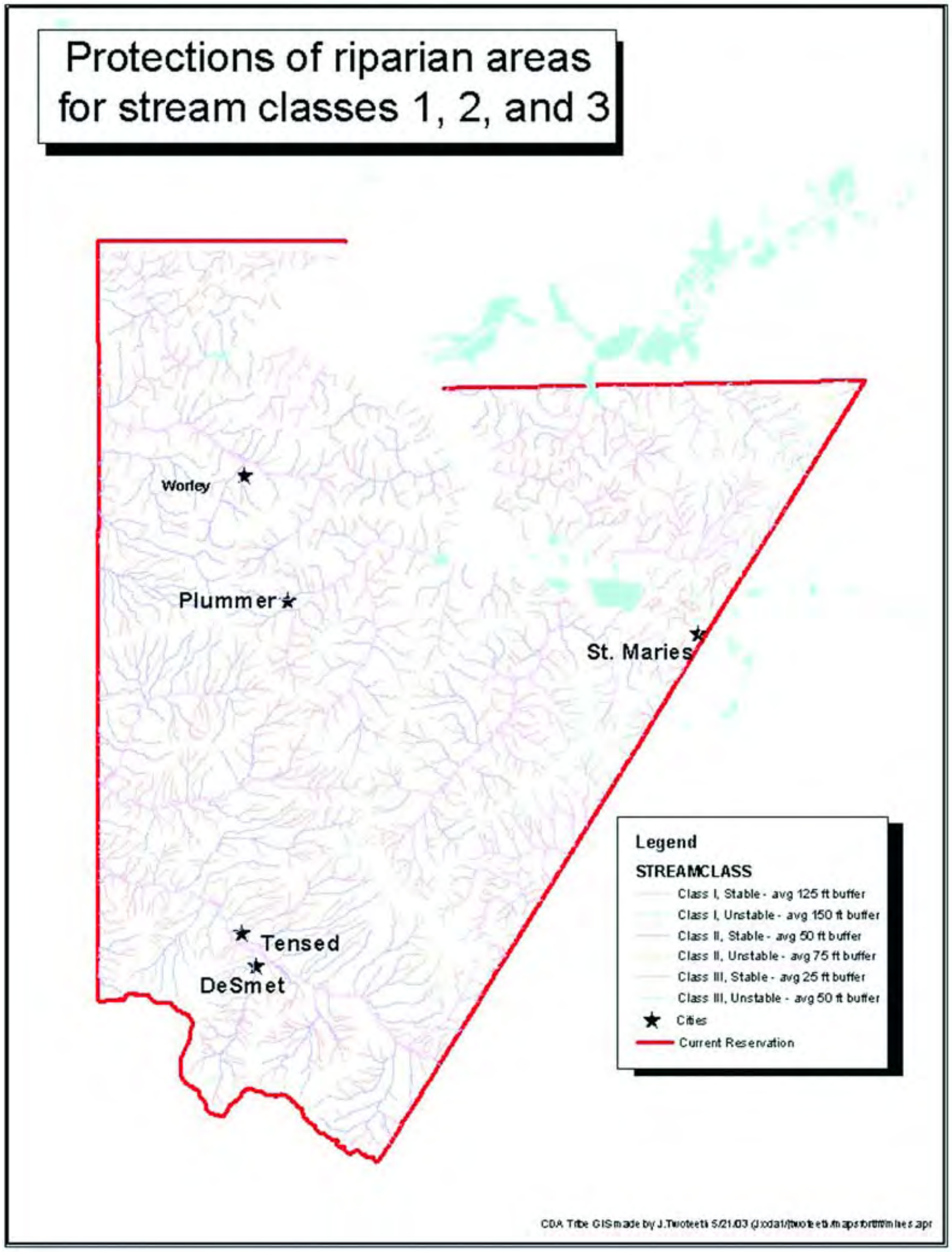


Figure 5.3.8.1 is a map of Class I, II and III streams on the Reservation, including recommended riparian protection buffers (refer to Appendix E for details on riparian recommendations).

Lake Creek Includes the Lake Creek watershed, that is a tributary to Coeur d'Alene Lake, and drains an area of 23,117 acres in Washington State, Idaho and the Coeur d'Alene Reservation (Bauer 1998). Forests cover 60% of the total area in this watershed and are generally found in the upper elevations and on steep banks near the lake. Just under 36% of the watershed is cropland with an additional 4% in pasture land.

Plummer Creek Includes the Plummer Creek watershed, that drains an area of 27,732 acres and empties into Chatcolet Lake approximately five miles east of Plummer, Idaho (Krueger 1998c). This watershed lies entirely within the Coeur d'Alene Reservation boundaries. Land use types are as follows in the Plummer Creek watershed; 22% agricultural, 8% pasture and hay land, 63% forest land and 1.5% urban development (Krueger 1998c). The remaining land is either grassland or newly planted coniferous trees. Portions of both U.S. Route 95 and State Route 5 pass through the watershed. This watershed also includes Little Plummer Creek and Peedee Creek tributaries.

Benewah Creek Includes the Benewah Creek watershed that drains approximately 37,447 acres and includes 136 miles of perennial and intermittent tributaries. The watershed lies completely on the Coeur d'Alene Reservation (Cd'A Tribal GIS 1998). The creek discharges into Benewah Lake which is located at the southern portion of Coeur d'Alene Lake. Vegetation coverage consists of young and regenerating forest (31%), mature forest (53%), grass and forbs (9%), and shrub (7%).

St. Maries/St. Joe Rivers Includes a portion of the St. Joe and St. Maries Rivers, that drain approximately 1,888 square miles. This group includes Alder Creek, Cherry Creek, John Creek, Little John Creek, Hells Gulch Creek and all other tributaries which drain into the St. Maries or St. Joe Rivers.

Coeur d'Alene Lake tributaries Include several other smaller creeks and perennial streams that drain directly into Coeur d'Alene Lake, or the Coeur d'Alene River. This group includes Fighting, Bellgrove, Cave Bay, Unnamed Cave Bay, Aberdeen Bay, Cotton Bay, O'Gara Bay, Shingle Bay, Black, Willow, and Evans Creeks.

Hangman Creek This group includes Hangman Creek proper, Little Hangman and Rock Creeks. The headwaters of Hangman Creek Watershed begin approximately 10 miles southeast of Tensed, Idaho. The creek flows in a northwesterly direction, entering the state of Washington seven miles northwest of Tensed. The watershed features a classic dendritic pattern which includes three major subwatersheds: Mission Creek, Nehchen Creek, and Lolo Creek. These subwatersheds total approximately 87,000 acres, only part of which are on the Reservation.

Noxious weeds on Freeze Out Mountain (photo by John Hartman).

5.3.9 Soil

Soil is a basic element of the environment upon which plant and animal life depend. Soil productivity is a value-based condition of a site and ordinarily reflects a yield or potential yield of some vegetative commodity such as bushels of wheat, tons of forage, or volume of timber. The inherent yield capacity of the soils found on the Reservation is extremely variable, depending on the soil type and location. For instance, wheat yield can range from 30 bushels per acre on a Worley silt loam on Allotment #407 to 90 bushels per acre on a Palouse silt loam on Allotment #43 (Krueger 1998b).

Changes or impacts to soil quality characteristics may be evaluated by changes in land use rather than attempting to describe the effects on potential yields. Soil quality characteristics are erosion potential, chemical fertility, organic matter content, soil-dwelling organisms, and structure, porosity, and bulk density.

Erosion is the physical movement of soil from one place to another. Erosion occurs as a result of the action of wind, water, or machinery on the surface of the soil (Table 5.3.9.1). The loss of surface soil causes a loss of nutrients and organic matter, reduced effective rooting depth of the remaining soil, breakdown in soil structure, and reduction in plant growth (NRCS 1996a).

Table 5.3.9.1 Erosion Rates

In Tons/acre/year	*Good Conservation*	*Minimal Conservation*	*No Conservation*
Highly Erodible Land (HEL)	3–7	5–15	15–35
HEL with bluegrass on it	1	Negligible	Negligible
Non-HEL ground	0 - 5	No data	No data

The chemical fertility of the soil is the relative abundance of mineral nutrients available for plant growth. Major nutrients include nitrogen, phosphorus, potassium, and sulfur. Minor nutrients include, among others, calcium, magnesium, manganese, zinc, and boron. Chemistry of soils can change based on the types of use.

Soil organic matter is that fraction of the soil comprised of anything that once lived that is in various stages of decomposition. Organic matter provides a carbon source for soil microbes, aids in storing water in the soil, aids in the retention of nutrients (particularly nitrogen), helps maintain low bulk densities, and reduces the negative impacts of pesticides and other pollutants (NRCS 1996b).

Soil-dwelling organisms can include burrowing mammals (e.g. moles, voles), insects, mites, spiders, worms, nematodes, fungi, bacteria, and protozoa. The larger organisms generally shred larger plant material and mix the soil through burrowing activities. Small organisms feed on the by-products of the large organisms in a decomposing process which cycles nutrients and organic matter. The burrowing of the larger animals also provides channels for water infiltration. Fungal hyphae and slime from bacteria bind soil particles together forming water-stable aggregates that are more resistant to erosion than the unincorporated particles. Formation of particle aggregates also creates large pore spaces in the soil, which aids root penetration and infiltration of water and air (NRCS 1998).

Structure is the general make-up of a soil and includes (among others) texture, porosity, bulk density, type and degree of soil aggregation, and the type and degree of horizonation (layering). Structure is directly related to the minerals from which the soil was formed. Most soils in the western portion of the Reservation were formed from deep layers of wind-deposited silts and clays. Soils in the eastern portion of the Reservation formed from sedimentary, metasedimentary, and basaltic rock. All soils on the Reservation have or had a cap of light-textured volcanic ash deposited after eruptions of volcanoes in the Cascade Range of Oregon and Washington (Harvey, *et al.* 1989).

Porosity refers to the size and distribution of pores (spaces) in a soil and is directly related to root penetration and the infiltration of water and air. Bulk density refers to the weight of a soil for a given volume and is used as a direct measure of porosity and an indirect measure of organic matter content. Increased bulk density is associated with low porosity and low organic matter. Bulk density decreases as porosity and organic matter increases. As a result, the lower the bulk density (higher porosity), the greater the root penetration and water/air infiltration.

By design, all farming practices used to produce commodity crops affect soils. Plowing and cultivation expose bare soil to erosion from wind and water. Repeated downhill plowing and out-field plowing are both types of mechanical erosion that move soil one direction over time. Plowing and cultivation also alter soil structure and habitat for soil-dwelling organisms by physical alteration. Repeated plowing in soils heavy with clays can produce a nearly impervious “plow pan” at the plowing depth that prevents or inhibits water infiltration.

Crop rotation, divided slope cropping, no-till farming, and use of perennial crops such as hay and bluegrass reduce the amount of erosion caused by agricultural practices. Summer fallowing and annual cropping using conventional tillage expose soils to accelerated rates of erosion (Sutherland 1989; U.S. Department of Agriculture Soil Conservation Service).

When soils are tilled, organic matter is decomposed faster because of changes in water, aeration, and temperature conditions. Most organic matter is lost within the first 10 years after clearing of wooded areas or tilling native grasslands (NRCS 1996b). Loss of nutrients generally accompanies loss of organic matter. Organic matter can be increased in tilled soils by reducing the amount of tillage, applying animal manure or other carbon-rich waste, or using no-till or mulch-till practices. Nutrients can be replaced by applying chemical or natural fertilizers.

Grazing impacts to soils are associated with very long-term or intense short-term usage. Soil structure and abundance of soil organisms are impacted by compaction of the soil by the animals’ hooves, especially if grazing occurs when the soil is wet. Dominant Soils on the Reservation include:

- Ardenvoir—Huckleberry
- Huckleberry Silt Loam
- McCrosket—Ardenvoir Association
- Santa Silt Loam
- Taney Silt Loam

5.3.10 Water

5.3.10.1: Ground Water

Ground water includes any sub-surface flow ranging from the deepest confined aquifer to shallow sub-surface flow. Ground water is susceptible to contamination by a number of pollutants that might be present in the soil. Ground water that percolates deep into the earth has a lesser impact on terrestrial and aquatic species than shallow sub-surface flow. Microorganisms clean deeper ground water, as it filters through the soil, to become relatively isolated from local terrestrial communities. However, even deep ground water can resurface in springs, wetlands or other areas where an aquifer meets the surface.

Pollution of shallow sub-surface flow has a greater impact on the natural environment because it has a tendency to re-enter surface run-off. This makes clean ground water not only important to humans but also fish, wildlife, aquatic macrophytes, macroinvertibrates, riparian plants, and wetland species. The degree to which contaminated ground water may affect these organisms is dependent on the concentration of the pollutant and that species' resistance to it.

The quality of ground water in Idaho's aquifers is influenced by both natural factors and by human activities. Natural factors affecting ground water quality include; the chemistry of precipitation; the dissolution of organic and mineral substances as the water percolates through earth materials; and the length of contact of the ground water with soil and rocks of the aquifer (Ground Water Quality Council 1996). Human activities that impact ground water quality are water withdrawal from the system, and contamination with biological or chemical substances.

Potential sources of ground water contamination on the Reservation include such point sources as surface spills, leaking underground tanks, and landfills. These types of contamination tend to be concentrated in urban areas, but can occur in rural areas on the Reservation. Potential non-point sources of contamination on the Reservation include field application of fertilizers and other agricultural chemicals and urban runoff. Although these sources are usually individually diffuse, the cumulative effect of a high density of non-point sources results in ground water contamination.

According to 1998 Underground Storage Tank (UST) inventory information provided by the Tribe, a total of 97 tanks existed on the Reservation, 68 of which have been closed or removed, leaving 29 USTs which have not been closed or removed (Coeur d'Alene Tribe 2000b). Based on EPA information as of 2009, one UST in Plummer was on the leaking underground storage tank (LUST) list (U.S. EPA 2011a).

Most Reservation residents receive their drinking water through public supply systems or small private wells. Other than the City of St. Maries water supply, which lies outside of the Reservation, nearly all drinking water is derived from ground water sources. The EAP Assessment focused on recorded public and private systems. However, there may be private wells or surface water withdrawals that are not recorded and where no information was available (Coeur d'Alene Tribe 2000b).

Drinking water quality and contamination appeared to be a potential health concern for many of the individuals interviewed. Several individuals mentioned that they had lost confidence in their local water supply and had elected to buy and drink bottled water. The number of drinking water "boil orders" in the recent past, and an occasional objectionable taste and odor, including a noticeable chlorine taste were cited as the primary reasons for switching to alternative drinking water sources. Some anecdotal information regarding the contamination of shallow, dug wells and the presence of nitrate in ground water was provided by the interviewees (Coeur d'Alene Tribe 2000b).

Nearly all of the monitoring data obtained regarding drinking water quality and contamination were related to systems using ground water sources. While no data were obtained for the St. Maries public water supply system, monitoring data are available through the Idaho Division of Environmental Quality and the EPA Region 10. Based on a conversation with one health official from St. Maries, there have been no obvious health problems associated with drinking water in that area.

Water tower in DeSmet, ID (photo by John Hartman).

Public supply systems for which data were obtained include DeSmet, Tensed, Plummer, Worley, the Coeur d'Alene Tribe's Sub-Agency in Plummer, and the Coeur d'Alene Tribal Casino Resort Hotel. Data were also obtained for about 25 individual wells across the Reservation. Records for most wells on the Reservation were obtained through the Idaho Department of Water Resources and the Indian Health Service. The following are the major findings of this section:

- The vast majority of public and private wells on the Reservation are between 250 and 400 feet deep. Because of the depth of most wells, and because of the presence of relatively impermeable layers of clay or metamorphic rock between the surface and most drinking water sources, drinking water sources in most areas appear to be well protected from potential sources of contamination.
- Available monitoring data and other information indicate that most drinking water quality violations are likely the result of contamination in the delivery system, either from water delivery pipes or home plumbing.
- Drinking water violations for lead and copper on the Reservation were very infrequent and, in some cases, samples appear to have been taken from water taps that were not normally used for drinking water consumption. These violations appear to result from the corrosion of pipes or other plumbing fixtures. Drinking water violations for total coliform were the most common and were most frequently observed in the City of Plummer water supply system.
- Total coliform bacteria is the most widely used indicator organism for drinking water, and the presence of these bacteria may indicate possible contamination by a number of other bacteria that may cause illness. They have been most frequently present in systems when there are leaks in water mains or when a system is otherwise "open" for repairs, construction, or maintenance. Data do not indicate the presence of fecal coliform in association with total coliform in any of the public supply systems.
- Iron and manganese drinking water violations in nine private wells were for exceedance of secondary drinking water standards. These

metals are believed to have only aesthetic effects, such as taste, color, or odor.

- In wells for which monitoring data are available, no agricultural chemicals or Volatile Organic Compounds (VOCs) were detected.
- Historical information indicates that in the late 1970s there were shallow wells and poorly constructed deep wells that were a health hazard due to seepage from septic tanks. This problem was believed to be most serious in the Tensed area. It is not known if the same conditions exist today.
- Water quality, condition, and vulnerability of most private wells appear to be largely unknown.
- Infants and children are exposed to more waterborne contaminants relative to their size than are adults. One-year-olds drink more than twice as much water relative to their size as do adults.

Based on the available information, drinking water supplies that appear to be most vulnerable to contamination are:

- shallow wells, if they are near potential contamination sources
- poorly constructed or poorly maintained wells
- supply systems that are frequently “open” due to breaks or construction
- public or private systems using highly corrosive water, especially older systems (Coeur d’Alene Tribe 2000b)

The ground water monitoring that is done on the Coeur d’Alene Reservation by the Idaho Department of Water Resources is included as part of a network of approximately 1,600 wells and springs used to evaluate ground water quality throughout Idaho. Twenty-three sites were sampled on the Coeur d’Alene Reservation during 1997. Wells are sampled yearly for the following parameters: temperatue, pH, specific conductance, alkalinity, fecal coliform bacteria, common ions, nutrients, selected trace elements, radioactivity, volatile organic compounds, and pesticides.

The Idaho Department of Water Resources classifies the aquifer underneath the Reservation as an unconsolidated alluvium, which is made up of sand, gravel and some clay (Idaho Department of Water Resources 1998). Due to the geology and associated aquifer substrates, high levels of iron, manganese, and zinc are found naturally in the ground water. Data from the IDWR 1991-93 and 1997, Ground Water Quality Monitoring Programs reveal elevated concentrations of these minerals at many of the wells on the Reservation in Plummer, and the second near Little Hangman Creek. The Plummer well is surrounded by pasture and agricultural land, with the town lying just down gradient. A concentration of 9.7 mg Nitrate/l was detected in this water. Contamination at this well was believed to be a result of fertilizer leaching into the ground water from the agricultural land above. The well was not used for domestic purposes, but rather as a water source for stock animals. The second impacted well had a Nitrate concentration of 5.1 mg/l. Although not as high as the first well, this elevated amount indicates some sort of contamination. Due to the location of this well, the elevated Nitrate concentrations were most likely a result of leaching fertilizers from the adjacent farmland.

Although grazing can contribute fecal bacteria to surface runoff, it appears to have little effect on bacterial concentrations in ground water (Mosley, *et al.* 1998). This is due to the fact that most fecal bacteria are readily filtered by the soil. Studies with *Escherichia coli* have shown that 92 to 97% of the bacteria filter out in the top four-tenths of an inch of soil (Mosley, *et al.* 1998).

Changes in hydrology are really changes in environmental conditions or processes. Thus, for purposes of this plan, the concern over hydrologic changes was treated as an environmental element.

5.3.10.2: Surface Water

<u>Hydrologic Changes</u>

Hydrologic changes are those changes related to the quantity and timing of surface water runoff. Specific parameters include peak flows, low flows, annual water yield, and channel conditions (i.e., bank and channel stability). Those general categories of sources of environmental change that are currently associated with the Reservation affecting these hydrologic parameters include:

- Agricultural Practices
- Transportation Systems
- Forestry Practices

- Water Systems
- Human Habitation

Perhaps the greatest effect agriculture can have on stream hydrology is through the conversion of forest and native grasslands to croplands. Reductions in forest cover can lead to increases in peak flow, can increase annual yields, and can create lower flows during the summer months. Associated with this impact is the conversion of wetlands to croplands. Loss of wetlands reduces the watershed's water holding capacity. In addition, extensive dike and drainage systems have been constructed to drain land for agriculture on the lower St. Joe River, and various places in the Hangman Creek Watershed.

The primary concern about forestry practices is the loss of forest canopy which increases evapotranspiration. Trees increase the amount of water which can infiltrate into the soil. Trees intercept and then regulate the snow melt over a protracted period, increasing infiltration. By increasing infiltration (especially in the winter and spring), summer base flows are increased. Logging systems, especially tractors or rubber tire skidders, can cause soil compaction, and rutting. This will reduce infiltration and increase surface flow. Slash burning can create hydrophobic soils, reducing infiltration. This is especially true for large slash piles. Current Tribal Forest Plan Management Standards and Guidelines address ways of reducing these impacts throughout the Reservation lands.

With increases in human population throughout the Reservation and the Tribe's aboriginal territory, a greater demand for roads, new construction, and other development will add impervious surfaces to the area, changing stream hydrology (Maguire 1997). Urbanization will alter the hydrology of storm water runoff in a number of ways:

- Increased magnitude/frequency of severe floods
- Increased frequency of erosive bankfull and sub-bankfull floods
- Reduced ground water recharge
- Higher flow velocities during storm events

Reservoirs, surface water diversions, and wells have the potential to affect water quantity. Wells, which reduce ground water levels, could have a cumulative effect on surface water flow, depending on water table slope and drainage pattern. There is no site-specific data for the Reservation on present day or historical ground water elevations. Below is information by watershed or LMA for the Reservation.

Lake Creek Removal of forest canopy cover, due to both clearing for agricultural purposes and forest harvest activities, has increased peak flows since settlement. Peak discharge modeling indicates that peak discharges have increased from 55% to 83% for 5 year to 100-year events respectively, from pre-settlement period to current conditions (Coeur d'Alene Tribe 1998b). It is likely that these potential increases in peak flows have resulted in increased flooding and channel instability.

Land clearing for agricultural purposes, grazing and timber harvest have caused damage to riparian vegetation and function. This has resulted in highly erodible stream banks, unstable stream channels, and braided stream reaches (Graves et al 1990; Lillengren, *et al.* 1993).

Plummer Creek Removal of forest canopy cover, due to both clearing for agricultural purposes and timber harvest activities, has increased peak flows since settlement. Peak discharge modeling indicates that peak discharges have increased from 62% to 83% for 5-year to 100-year events, respectively, from pre-settlement period to current conditions (Krueger 1998c). A watershed assessment, modeling and management plan development project completed in 2009 (Coeur d'Alene Tribe Lake Management Department 2009 and TerraGraphics 2009) identified areas within the Plummer and Little Plummer creek watersheds where nutrient and sediment loading was highest. This project also addressed, in a cursory way, areas where stream bank erosion was occurring and likely contributing to the sediment and nutrient loads which make their way into Chatcolet Lake.

Benewah Creek Little information is available about changes in peak flow, low flow or annual yield in the Benewah Creek watershed. However, based on land use patterns it is likely that changes have occurred. Graves, *et al.* described the stream channel and banks of the creek as stable in 1990.

Measured base flows are typically less than 25 percent of average annual flow. Furthermore, more than 50 percent of the stream channel inventoried in 1993-1994 indicated poor to fair stability (Lillengreen et.al. 1996). Continuous bank cutting in some stream reaches is a result of reduced vegetative bank cover, simplification of stream channels, and increased peak flows.

St. Joe/St. Maries Information on peak flow was not available for this watershed. However, it might be expected that increases have occurred, based on land use patterns. For example, construction of dikes, draining of wetlands and conversion to agricultural land would alter the hydrology of the river by converting its flood storage capabilities. Although hydrographs do not exist for the river, this change could be expected to increase the peak flow of the system.

Channel conditions appear to vary considerably within this watershed group. In Hell's Gulch, clearing of lands for agricultural purposes and grazing have left little riparian vegetation, particularly in the lower reaches. This has led to highly erodible stream banks, unstable stream channels, and braided stream reaches (Graves, *et al.* 1990). Conversely, Alder Creek is described as having stable banks and channel (Graves, *et al.* 1990; Lillengreen, *et al.* 1993).

Coeur d'Alene Lake Tributaries Information on peak flow increases in tributaries of the lake was not available, however, it might be expected that increases have occurred, based on the results found for the Lake Creek and Plummer Creek watersheds.

Channel conditions appear to be variable over the watershed. In Bellgrove, Fighting, Nehchen, and Willow Creeks, clearing of lands for agricultural purposes, grazing practices, and logging adjacent to streams have caused damage to riparian zones, resulting in erodible stream banks, unstable stream banks and channels, and braided stream reaches (Graves, *et al.* 1990). Conversely, Black and Evans Creeks are described as having stable channels (Graves, *et al.* 1990; Lillengreen, *et al.* 1993).

Hangman Creek Changes from forest land to crop, pasture, and urban uses has impacted hydrology in the Hangman Creek watershed. Reduced low flows restrict aquatic resources (U.S. Department of Agriculture 1994). Wetlands adjacent to the stream have been drained to support farming (U.S. Department of Agriculture 1994).

Lower reaches of the drainage have been channelized to accommodate roads, and meanders have been cut off, with subsequent increases in channel gradient. As a result, these activities have influenced stream bank stability in the lower reaches, resulting in flood damage, excessive stream bank erosion, and low mid-summer flows (U.S. Department of Agriculture 1994).

Tribal Water Quality Standards

The Tribe has had Tribal water quality standards for all surface waters of the Coeur d'Alene Reservation in place since 1999. In 2005 the Tribe sought and was granted approval for interim partial treatment as in a similar manner as a state (TAS) status for those waters of the lower 1/3 of Coeur d'Alene Lake and the St. Joe River within the exterior boundaries of the Reservation. The Tribe developed and adopted specific standards to these "TAS approved waters" and submitted them for EPA review and approval in 2010. An additional application seeking TAS status for the entire Reservation is still on file with EPA. These two versions of Tribal standards (1999a, 2010) have been adopted pursuant to Sections 303 and 518 of the Clean Water Act and Chapter 42 of the Coeur d'Alene Tribal Code. These standards serve to protect the public health and welfare, enhance the quality of waters of the Coeur d'Alene Tribe, and serve the purposes of the Clean Water Act.

Total Maximum Daily Load

A Total Maximum Daily Load (TMDL) specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and allocates pollutant loadings among point and nonpoint pollutant sources (U.S. EPA 2011b). By law, EPA (Environmental Protection Agency) must approve or disapprove 303 (d) lists and TMDL's established by States, Territories, and authorized Tribes. If a State, Territory or authorized Tribe submission is inadequate, EPA must establish the 303 (d) list or the TMDL (U.S. EPA 2011b).

A TMDL can be broken down further based on sources of pollutants. These pollutants fall into two categories: point sources which receive wasteload allocations and nonpoint sources, which receive a load allocation. This also includes natural background. A TMDL also must include a margin of safety to allow for any uncertainties in the scientific methods used to derive the TMDL.
TMDL= Wasteload Allocation (point sources) + Load Allocation (nonpoint sources and natural background) + Margin of Safety.

TMDL's are currently being completed for the following streams, which lie wholly or partially within the Reservation (please go on to following page):

Table 5.3.10.2.1 Coeur d'Alene Reservation TMDLStreams

Stream name	*target date for completion*	*pollutant(s) of concern*
Lake Creek	Completed	Sediments
Fighting Creek	In Draft	Sediments, Nutrients, and Habitat Alteration
Willow Creek	2014	Sediments
Black Lake	2011	Nutrients
Benewah Creek	2015	Sediments, Nutrients, Dissolved Oxygen and Habitat Alteration
Hangman Creek	2016	Sediments, Nutrients, and Bacteria
Little Hangman Creek	2017	Nutrients
Alder Creek	2018	Sediments

5.3.11 Wetlands

A functional wetland is defined as one that a) provides sediment and nutrient filtration such that waters entering Reservation streams do not carry excess pollutants, and b) provides habitat for the full assortment of native fish and wildlife that use wetland habitats.

An estimated 23,129 acres of Palustrine Wetland vegetation has been converted to agricultural cropland and other human development, which represents an approximately 82% loss of estimated original wetlands on the Reservation (Coeur d'Alene Tribal G.I.S. 2011). An estimated 114,411 acres of combined forest, grassland (including native bunchgrass prairie), and shrub types have been converted to cropland and pasture.

Wetlands are found on the Reservation in all of the watersheds or LMAs, associated with all of the rivers, streams and creeks and interspersed within agricultural and forest land.

Littoral wetlands (those associated with shallow lake areas) are defined as those of a Lacustrine system that extends from shore to a depth of 2 meters (or 6.6 feet) below low water or to the maximum extent of nonpersistent emergent plants (Mitsch 1993). These types of wetlands are found on the Reservation in association with Coeur d'Alene, Black, Benewah, Chatcolet, Hidden and Round Lakes. For the purposes of this plan the Tribe will not be considering deep-water habitats in the discussion of wetlands on the Reservation.

Palustrine Wetlands are also common on the Coeur d'Alene Reservation and exist in association with lakes, the flood plains of rivers and streams, and as isolated wetlands located in low areas, or depressions. Palustrine wetlands are scattered throughout the Coeur d'Alene Reservation in the forests, the flood plains of all of the rivers and streams, in and around agricultural fields, and around the boundaries of lakes. Estimates taken from a soil survey map reveal that historically there may have been as many as 28,073 acres of Palustrine wetlands on the Reservation (Coeur d'Alene Tribal GIS 2011). A National Wetland Inventory estimated there to be 4,944 acres of wetland on the Reservation in 1999 (U.S. Fish and Wildlife Service 1987), which would amount to an 82% loss.

Of particular interest and cultural value to the Coeur d'Alene People is the wetland associated with the floodplain of the St. Joe River and Hangman Creek.

This ecosystem is unique to the Reservation for its value to wildlife, waterfowl, fisheries, and culturally important plants. Particularly, camas and water potatoes, as well as other Tribal culturally important species, are associated with healthy wetlands.

The following wetland areas and quantities are estimates derived from U.S. Fish & Wildlife Service's National Wetland Inventory (U.S. Fish and Wildlife Service 1987) and hydric soils maps analyzed by the Coeur d'Alene Tribe's G.I.S. Program. Wetland areas are quantified per watershed utilizing hydric soils to estimate historic wetlands and NWI to estimate current wetlands. It is important to note that NWI has difficulty identifying and delineating wetlands less than 10 acres in size and wetlands with relatively dense overstory. One of the most widely accepted classification systems and definitions of wetlands including acceptance from the U.S. Fish & Wildlife Service, defines wetlands as:

> "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes (water-loving plants); (2) the substrate is predominantly undrained hydric (wet) soil, and (3) the substrate is non-soil and is saturated with water or covered by

shallow water at some time during the growing season of the year (Cowardin, *et al.* 1979)."

Lake Creek Based upon hydric soils, the Lake Creek watershed is estimated to historically have had 653 acres of wetlands. The quantity of wetlands in the watershed is currently estimated to be 281 acres based upon NWI. Therefore, it is estimated that wetlands in the watershed have been reduced by 57%.

Plummer Creek Based upon hydric soils, Plummer Creek watershed is estimated to historically have had 643 acres of wetlands. The quantity of wetlands in the watershed is currently estimated at 279 acres based upon NWI. Therefore, it is estimated that wetlands in the watershed have been reduced by 57%.

Benewah Creek Based upon hydric soils, Benewah Creek watershed is estimated to historically have had 604 acres of wetlands. The quantity of wetlands in the watershed is currently estimated at 392 acres based upon NWI. Therefore, it is estimated that wetlands in the watershed have been reduced by 35%.

St. Maries/St. Joe Rivers Based upon hydric soils, the St. Maries/St. Joe Rivers watershed is estimated to historically have had 4,235 acres of wetlands. The quantity of wetlands in the watershed is currently estimated at 1,098 acres based upon NWI. Therefore, it is estimated that wetlands in the watershed have been reduced by 74%.

Coeur d'Alene Lake Tributaries Based upon hydric soils, the Coeur d'Alene Lake watershed is estimated to historically have had 2,922 acres of wetlands. Currently, the quantity of wetlands in the watershed is estimated to be 1,280 acres based upon NWI. Therefore, it is estimated that wetlands in the watershed have been reduced by 56%.

Hangman Creek Based upon hydric soils, the Hangman Creek watershed is estimated to historically have had 19,016 acres of wetlands. The quantity of wetlands is currently estimated to be 1,615 acres. Therefore, it is estimated that wetlands in the watershed have been reduced by 92%.

5.3.12: Wildlife

"Before the coming of Human Peoples the world was inhabited by powerful Animal Peoples, also known as the 'First People' "
(Frey and the Schitsu'umsh 2000).

Sustainable, naturally reproducing populations of native wildlife that support both subsistence and limited sport harvest will likely be reached by maintaining the functions and attributes of healthy portions of the ecosystem, and working with modified aspects of the ecosystem to either restore lost ecological components or replace them with other components that produce desirable outputs.

Native plants and animals are important elements of the ecosystem on the Reservation. Specific plants and animals could occur entirely on the Reservation, as a local population, or could occur both on and off of the Reservation. This is quite often the case for wildlife species which migrate or have large home ranges (*e.g.*waterfowl and big game).

Wetlands in the Winter months in Cheney, WA (photo by John Hartman).

Ungulate populations of moose, elk and deer are considered a high priority on the Reservation. These species are important for the subsistence of many Tribal members and are also some of the most visible wildlife species present on the Reservation. They rely heavily on the lower elevation forests to take advantage of the cover, forage and milder climatic conditions during the winter. Unfortunately, critical winter range habitat has declined due to development and deforestation.

Much of the habitat within and surrounding the Reservation has been altered from historical conditions. Impacts from agriculture are pervasive on the western side of the Reservation, which encompasses the eastern edge of the Palouse Prairie. These impacts include the conversion of Palouse Prairie and forests to agricultural land and the modification of streams to create more room for farming practices. There has also been a decline in the early seral forest species such as ponderosa pine, western white pine and western larch, and a shift to late seral species such as douglas-fir, grand fir and western hemlock. Large diameter trees, snags and down woody material have also decreased and been replaced with younger, smaller stands of dense, mixed species. This has mixed results for wildlife, benefiting species that use younger stands, and causing a decline in species that favor old growth conditions. There are virtually no stands on the Reservation that could be characterized as old growth with large diameter trees, relatively low stocking densities and an abundance of snags and downed woody material.

The key parameters associated with evaluating impacts to these ecosystem elements are the population of a given species, and the diversity of species present. Population reflects the abundance, or number, of each particular species, which occurs at least seasonally on the Reservation. Diversity, as used in this document, refers to the number of species present, at least seasonally, on the Reservation.

Appendix E has a list of species with a habitat description that can be found on the Reservation. Impacts to wildlife will be measured based on loss of habitat, fragmentation, and loss of migration corridors.

5.3.13: Threatened and Endangered Species

The U. S. Fish and Wildlife Service has identified six threatened species that may occur within the vicinity of the Coeur d'Alene Reservation. Some information exists that can be used to characterize the distribution and status of most of these species within the Reservation (Coeur d'Alene Tribe Wildlife Program 2011). A brief discussion of each of these species is presented below.

Gray wolf (Canis lupus) Wolves within the Reservation boundaries are currently considered endangered by the U.S. Fish and Wildlife Service. Suitable wolf habitat does exist on the Reservation, with the biggest patches occurring along the eastern boundary. The Tribe has documented wolf activity on the Reservation and implements annual tracking surveys each winter. The closest documented packs occur just east of the Reservation boundary, near the towns of St. Maries and Emida. Wolf populations may continue to expand until constrained by human imposed limitations, so it is possible that a pack could become established in the future.

Bald eagle (Haliaeetus leucocephalus) Bald eagles use lands on the Reservation largely as wintering areas, although they can be seen year round. The number of bald eagles using the Reservation varies from year to yea, but concentrations can become quite high in the winter. Common food sources for eagles on the Reservation include carrion, waterfowl, fish, and small mammals. Wintering eagles congregate along the shores of Coeur d'Alene Lake to feed on fish, but are also observed feeding on carrion and roadkills throughout the Reservation. There are a few known eagle nests on the Reservation located near Coeur d'Alene Lake and the St. Joe River. It is likely that this nesting will continue into the future.

Canada lynx (Lynx Canadensis) The US Fish and Wildlife Service listed the lynx as a threatened species on March 24, 2000. Lynx occur in mesic (moderately moist) coniferous forests typically at higher elevations that have cold, snowy winters. In northern Idaho, lynx habitat generally occurs above 4,000 feet. Characteristics of foraging habitat include a dense, multi-layered understory that provides cover and browse at ground level and at varying snow depths throughout the winter. Habitats that support their primary prey of snowshoe hare include early successional stages resulting from natural disturbance and timber harvest. Older forests with a substantial understory of conifers or small patches of shrubs and young trees also provide lynx foraging habitat.

Den sites are also an important component of quality lynx habitat. Den sites may be located within older regenerating stands or in mature conifer stands that both include large woody debris. For denning habitat to be functional it must be in or adjacent to foraging habitat. Changes in forest structure, human disturbance and access may affect lynx and lynx habitat.

The Tribe has conducted lynx surveys on and in close proximity to the Reservation in the past. Lynx have not been found within the Reservation boundaries, but have been found to the east up the St. Joe River and to the north in the Coeur d'Alene Mountains. It is possible that an occasional lynx could travel through the Reservation, but it would be unlikely that resident individuals occur due to the lack of suitable habitat.

Bull trout (Salvelinus confluentus) Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Habitat characteristics including water temperature, stream size, substrate composition, cover and hydraulic complexity have been associated with their distribution and abundance (Dambacher *et al.* 1997; Jakober 1995).

Stream temperature and substrate composition may be particularly important characteristics of suitable habitats. Bull trout have repeatedly been associated with the coldest stream reaches within basins. The lower limits of bull trout distributions mapped by Lee *et al.* (1997) correspond to a mean annual air temperature of about 4°C. Temperature may be strongly influenced by land management and climate change and both may play an important role in the persistence of bull trout.

Bull trout are more strongly tied to the stream bottom and substrate than other salmonids (Pratt 1992). Substrate composition has repeatedly been correlated with the occurrence and abundance of juvenile bull trout and spawning site selection by adults (Dambacher *et al.* 1997, Rieman and McIntyre 1993, Graham *et al.* 1981, McPhail and Murray 1979). Fine sediments can influence incubation survival and emergence success, but might also limit access to substrate interstices that are important cover during rearing and overwintering (Weaver and White 1985, Goetz 1994, Jakober 1995).

Bull Trout (photo by Angelo Vitale).

Bull trout can currently be found in the Coeur d'Alene Lake basin. Population surveys conducted within the lake over a three-year period suggest that a small number of adfluvial bull trout rear in the lake and juvenile, sub-adult and adult life stages are likely present much of the time. No young-of-year bull trout have been identified. The entirety of Coeur d'Alene Lake is considered part of the critical habitat designation for bull trout in the basin.

Bull trout are not currently known to spawn in any of the Reservation streams entering Coeur d'Alene Lake. Annual population surveys conducted within several tributaries over a fifteen-year period suggest no spawning activity by bull trout, as no young-of-year bull trout have been identified. These same surveys, however, have indicated at least temporary use by adult and sub-adults in the Lake, Benewah and Fighting creek watersheds. In each case, fish were captured during late-summer with individuals likely entering tributaries seeking thermal refuge prior to or during migratory runs to spawning grounds. Temporary, seasonal use such as this may occur in the lower reaches of other similar tributaries.

On September 26, 2005, the U.S. Fish and Wildlife Service published the Designation of Critical Habitat for the Bull Trout; Final Rule in the Federal Register (Vol. 70, No. 185). Critical habitat for bull trout is designated on the following water bodies in the Coeur d'Alene Basin: Beaver Creek, Coeur d'Alene Lake, Coeur d'Alene River, Eagle Creek, Fly Creek, North Fork Coeur d'Alene River, Prichard Creek, Ruby Creek, St. Joe River, Steamboat Creek and Timber Creek. Bull trout critical habitat is located on the Reservation in Tribal waters of Coeur d'Alene Lake and the St. Joe River. For exact locations of bull trout critical habitat, consult the Final Rule in the Federal Register.

Ute ladies'-tresses (Spiranthes diluvialis) This species is primarily restricted to wetland and riparian areas, including spring habitats, wet meadows and river meanders. It occurs between 4,300 and 7,000 feet in the central Rockies and adjacent plains. Habitat consists of alluvial substrates along perennial stream and rivers that flood in the spring. Soil must be moist to the surface throughout the growing season. It has been found in Idaho along the South

Fork of the Snake River. It is commonly known in the *Elaeagnus commutata* (silverberry) community type within the Snake River floodplain. The species may be adversely affected by modification of wetland and riparian habitats resulting from livestock grazing, vegetation removal, excavation, construction, stream channelization, hydroelectric development and operation, and other actions that alter hydrology. There have been no known occurrences on the Reservation but potential habitat is suspected to occur.

Water howellia (Howellia aquatilis) This species is known to occur only in Washington, Idaho and Montana. It is a strictly aquatic species which roots in the sediment of ponds, river oxbows and sloughs and grows mostly submerged. The two main population centers for the plant occur near Spokane, Washington and the Swan River drainage of northwestern Montana. Surveys were conducted on the Coeur d'Alene Reservation in 2009 for the plant and was found on the southern end of the Reservation in the Hangman Creek watershed. Another known Idaho population occurs in Latah County, south of the Reservation.

5.4 Human Environment

"After the Gobbler Monster had swallowed most of the Animal Peoples, Coyote tricked the Monster into swallowing him as well. Once inside the monster's stomach, Coyote was able to free the other Animal Peoples and kill the monster. From the parts of the Gobbler Monster the various Human Peoples, including the Schitsu'umsh or Coeur d'Alene, were created and placed on their respective lands" (Frey and the Schitsu'umsh 2000).

5.4.1 Agriculture

The Coeur d'Alene Tribe depended on the homeland, inundated with gifts from the Creator supplied by Animal Peoples that would provide a yearly subsistence cycle in which roots and berries, fish (salmon), and game meat each contributed about a third to the total diet of the Coeur d'Alene. With the establishment of the Jesuit mission in 1848 came the introduction to a new form of prayer, the "reduction system", and self-sufficient farming communities. A considerable amount of land within the Reservation has been converted from either forested or grassland to agricultural land since the turn of the century. In 1998 it was estimated that 135,828 acres of land within the Reservation were used for agriculture (Coeur d'Alene Tribal G.I.S. 1998). Blue grass, wheat and legumes are the three main crops produced on the Reservation.

Approximately 114,411 acres of forested lands have been cleared for agricultural and other uses. These areas no longer support the native forest, shrub and grassland vegetation which once existed there. Conversion not only removes the trees, but the subsequent and repeated plowing also removes the other native vegetation. This can isolate the remaining forested areas from one another and interrupt the biological and chemical interactions associated with the forests on these lands. The presence of large areas of crop and pasture lands can also affect natural fire regimes, by preventing fires from spreading to forest stands (See Fire Section). Grazing in some of these areas by cattle and sheep has compacted soils, eliminated palatable native vegetation, and decreased conifer regeneration (Krueger 1998a).

Agricultural practices on these lands such as applications of herbicides and pesticides cause off-site drifts, which kill or damage trees, shrubs, or herbaceous plants, both native and non-native. Drift of pesticides also potentially kills beneficial insects, soil-dwelling arthropods, or other wildlife. Heat scorch or escaped fire from burning adjacent fields damage or kill trees and provide conditions conducive to tree-damaging insects or diseases.

Agricultural field burning is practiced on the Reservation and surrounding lands in northern Idaho, primarily for the burning of blue grass to increase grass seed production and wheat fields to reduce residue load for the following year's planting. The acreage burned varies from year to year depending on market prices and crop rotation. Approximately 23,000 acres of blue grass has been burned each year with 10-15,000 acres of wheat stubble burned in the 2009-2010 season. The main drawback of burning blue grass fields is the impact on air quality, and subsequent potential health effects, for the month or two that burning occurs each year. The benefits of burning blue grass fields are economic, allowing for more marketable crops of blue grass. Blue grass has done better economically than wheat and other crops in recent years. Blue grass is a perennial crop and it has greatly lessened soil erosion in agricultural fields, especially in areas with Highly Erodible Land (HEL).

Escapes of crop and weed species and transport of noxious weeds or other non-native plants is also a problem in these agricultural areas. Appendix E contains a list of noxious weeds present on the Reservation.

5.4.2 Development (Commercial and Industrial)

Nearly all-environmental concerns affecting human health are directly tied to population growth and development patterns on or adjacent to the Reservation. Population growth affects the sources of contamination, through increased rural, urban, commercial, and industrial development, as well as the number of people exposed to those contaminants. Population growth and development can dramatically affect the availability of traditional foods and medicines and other natural resources, and can potentially affect mental well-being by eliminating open spaces and natural resources that provide Tribal cultural, spiritual, and recreational opportunities.

The current Reservation population is estimated to be 6,943 (U.S. Census Bureau 2011). The Reservation population was 6,451 in the 2000 Census, 5,575 according to the 1990 Census and 4,911 in the 1980 Census. Increasing population and development on the Reservation may increase the number and magnitude of pollution sources, and may increase the population potentially exposed to environmental pollutants. Effects may include:

- Increased vehicle traffic, leading to increased air pollution and increased safety hazards.
- Increased use of synthetic building materials leading to increased indoor air pollution.
- Increased demand on drinking water supply systems leading to increased stress on the delivery system and potential contamination.
- Increased stormwater runoff from construction and urbanization.
- Increased waste generation and disposal.
- Increased sewage disposal.
- Increased land development, resulting in decreased availability of Tribal cultural foods and medicines.

Expansion of development may place a larger population in proximity to areas where agricultural chemicals are used and increasing development of tourism facilities, including restaurants, could increase the population potentially exposed to food contamination or drinking water contamination.

It is estimated that the Reservation population will increase by 15 percent over the next 10 years, with the most significant rate of population growth continuing to occur within the rural area of Kootenai County.

5.4.3 Energy

The Stimson Lumber Company (formerly Rayonier and then Plummer Forest Products) wood burning co-generation plant, built in 1982, is the only energy production facility located on the Reservation. Electricity produced by the facility is sold to Avista Corporation (formerly Washington Water Power). Enough power is produced to run the Stimson Lumber Company mill. The co-generation plant operates 24 hours a day, 7 days a week and produces about 5 Megawatts of power every hour. One Megawatt of power is enough to run

600-800 homes, depending upon the energy efficiency of the homes. Several other energy facilities located outside the Reservation boundaries have affected ecosystems on the Reservation.

Avista Corporation, Kootenai Electric Cooperative (KEC) and Clearwater Power are the three main suppliers of electricity to the Reservation. Avista generates much of its own power from six hydroelectric power stations on the Spokane River in Washington and Idaho and from two facilities on the Clark Fork River in Idaho and Montana. Avista also purchases additional power from other sources from non-hydroelectric plants to meet a substantial portion of the demand.. Avista sells surplus power to other companies, but they are a net importer of electricity due to purchasing electricity from more efficient producers at a lower cost.. Avista provides electricity to Northern Idaho's urban areas on and off the Reservation, including St. Maries. Discussion of impacts associated with Avista's generation of energy is not included in this document.

Kootenai Electric Cooperative is a power distributor only, buying their power exclusively from the Bonneville Power grid (Ward 1998), which includes electricity generated from hydroelectric dams throughout the Northwest, and some nuclear reactors. KEC distributes to most of the rural communities on the Reservation including the Plummer, Worley, and Harrison Flats areas. Clearwater Power supplies power to the southern end of the Reservation.

5.4.4 Environmental Health

The goals of the Tribal Environmental Health program are to ensure that the health and safety of Coeur d'Alene Tribal members and residents of the Coeur d'Alene Reservation are optimized and protected by managing the environmental factors affecting human health and safety.

Prior to 1999, limited environmental health services were provided to the Coeur d'Alene Tribe by a mixture of agencies. In November 1999, the Tribe hired its first Environmental Health Specialist (EHS) and directed the specialist to develop a comprehensive environmental health plan that would address existing and future environmental health risks facing the Tribe.

Environmental health risks are a subset of the larger universe of public health risks. The environmental health plan developed by the Tribe addresses these risks through nine core program areas, traditionally included in most environmental health programs, and two core areas that are specific for the Coeur d'Alene Reservation. Following consultation with the Benewah Medical Center Health Board and Tribal managers, the core areas were ranked for implementation according to available funding and Tribal priorities. The environmental health core program areas are presented below.

Food Protection

The food protection program consists of routine inspections of all food service facilities including restaurants, food stands, grocery stores, food distribution centers, celebrations, temporary events where foods are prepared, schools, day care centers, and food manufacturing operations. Generally, the food program consists of twice per year inspections of all permanent food establishments and single inspections for seasonal or temporary facilities. Additional inspections are made for celebrations, fund-raisers, and community events. Total inspections are approximately 80 per year. Other important components of this core program include plan review for all new construction or extensive remodels of food service establishments, consultation with operators, investigation of food-borne illness outbreaks, public health education for the community, and mandatory training for all food handlers.

Water Quality (also refer to section 5.3.10 Water)

The assurance of safe drinking water for human consumption is a primary environmental health concern. Traditionally, environmental health deals with the chemical and bacteriological quality of drinking water, delivery system construction, aquifer protection, and prevention of water-borne illness. When fully implemented, the program will consist of consultations, public health education, public and private water system inspections, bacteriological screening, water-borne illness investigations and disinfections of private water wells.

If funding were available, it would be possible for the Tribe to operate its own EPA certified water laboratory to carry out federally required bacterial tests for all Tribal public drinking water supplies.

The Tribal Environmental Programs Office has completed two Environmental Protection Agency grant projects under the Water Quality core program. The first project was completion of a Source Water Assessment in

2005. The second project was to develop both a Drinking Water Protection Plan for the Tribe's public water supplies and an Emergency Response Plan that would protect the drinking water supplies in the event of natural or man-caused disasters. Both projects were finished in 2007.

Institutional Sanitation

Institutional sanitation consists of routine health and safety inspections of Tribal public facilities such as schools, daycare centers, senior programs, detention centers, and community buildings. Other types of facilities like the Tribal Casino Resort Hotel, the Circling Raven Golf Course and the Wellness Center are also included. Plan review and consultation services are included in this program.

Solid Waste (also refer to section 5.4.9)

The main objective of this core program is the protection of human health and environmental quality by ensuring proper storage, collection, transportation, and disposal of solid wastes. When mishandled, solid wastes have the potential to adversely impact human health through contamination of soils, drinking water, surface waters, and air quality. Aesthetics and the potential for spread of disease by way of vectors are other issues that must be considered.

During 2002, the Tribe completed a preliminary assessment of how solid wastes are handled on the Reservation. The assessment revealed some problem areas including several open dumpsites, abandoned landfills, a lack of recycling capability, and a lack of a solid waste management plan.

Using additional Environmental Protection Agency funding, a Phase II assessment of solid waste handling on the Reservation was completed in 2004. The Phase II assessment picked up where the Phase I assessment left off and gave further information with which to evaluate solid waste management and also made recommendations for future improvements.

With information gained from the Phase I and II assessments, the Environmental Programs Office applied for, and was granted, EPA funding for developing an Integrated Solid Waste Management Plan. The Plan was completed and was approved by the Tribal Council in 2007.

Tribal Environmental Programs received other grant funding from the Environmental Protection Agency, U.S. Department of Agriculture, and Coca-Cola/National Recycling Coalition that was used to carry out a household hazardous waste clean-up event, Green Practices/Composting project, and recycling for plastic and aluminum containers, respectively.

The solid waste core program was originally proposed in the Comprehensive Environmental Health Plan because many solid waste activities are traditionally included under the umbrella of "environmental health." At the time the Environmental Health Plan was written, there was no single Tribal program with total responsibility for handling solid waste matters; however, in 2008 the Tribe formed a Public Works Department that included the responsibility for managing solid wastes on the Reservation. Environmental Programs/Environmental Health is available to assist the Public Works Department, should solid waste issues arise that affect public health and safety.

Liquid Wastes

Protection of human health, water supplies, and the environment by sanitary disposal of sewage is the main goal of this program.

Activities generally center upon small, single family, septic systems. The Tribal Environmental Health Specialist provides consultative services and responds to general complaints regarding sewage disposal.

Vector Control

Vector-borne diseases have been major causes of human morbidity and mortality throughout history. The majority of vector-borne diseases are spread by arthropods (insects, ticks, spiders, mites, millipedes, and centipedes), however mammals spread diseases such as rabies and Hantavirus.

The objectives of this program are protection of human health and safety and limiting or preventing the spread of vector-borne illnesses through control of vectors and their environment, and by public education. Presently, surveillance and public consultation regarding vector-borne illnesses are the main activities.

Environmental Health Technician Training

When implemented, this program will provide instruction and on-the-job experience, at the technician level, for Coeur d'Alene Tribal members interested in pursuing careers in environmental health. As in all other core program areas, adequate funding must be obtained before implementation can take place.

Water Recreation (refer also to section 5.4.8 Recreation)

The central goal for the water recreation program is protection of human health and safety by ensuring proper design, construction, and operation of Tribal public water recreation facilities. Water recreation facilities include swimming pools, hydrotherapy pools, wading pools, spas, water slides, spray pools, and bathing beaches. There are presently six Tribally owned pools on the Reservation. The environmental health specialist is responsible for inspecting all facilities twice per year to ensure that all water quality and safety standards are being met. Additional activities for this program are plan review for new facilities and epidemiological investigation of any outbreaks of waterborne illness.

Chemical and Physical Hazards

Chemical and physical hazards is a comprehensive program intended to address a wide range of threats to human health and safety. Chemical hazards include, but are not limited to, industrial chemicals, pesticides, environmental tobacco smoke, household chemicals, and materials such as asbestos, radon, or lead-based paint.

Physical hazards include dangerous buildings, abandoned wells, unsafe homes, plumbing and electrical hazards, biological contaminants, and preventable accidents.

When chemical or physical hazards are observed during routine inspections of public buildings, schools, day cares, and food service facilities, they are documented and brought to the attention of the person-in-charge. At this time, possible corrective measures are discussed including time schedules for making the corrections. Other important aspects of the program are public education, complaint investigation, and consultation.

Air Quality (refer also to section 5.3.1 Air Quality)

The Coeur d’Alene Tribe has an existing Air Quality program that operates out of the Tribal Natural Resource Department. The program deals with both indoor and outdoor air quality issues and the role of the Tribe’s Environmental

Health Specialist is to serve as support for the program. Complaint investigation and consultation are the main environmental health activities.

Hanford Health Effects

During the course of its operations, the Hanford Nuclear Site in southeast Washington released tremendous quantities of hazardous chemicals and radioactive materials into the environment. The Federal Government designated the Coeur d'Alene Tribe and eight other northwest tribes downwind from Hanford as being "affected" by hazardous materials releases. Representatives from the nine affected tribes joined to form the Intertribal Council on Hanford Health Projects (ICHHP) to deal with adverse human health effects that may have resulted from Hanford releases. ICHHP met twice per year in conjunction with meetings of the Hanford Health Effects Federal Subcommittee.

From 1996 to 2004, the Coeur d'Alene Tribe received funding through cooperative agreements with the Agency for Toxic Substances and Disease Registry (ATSDR) to develop environmental health capacity to deal with Hanford health effects. The cooperative agreements were, at that time, one of the main sources of funding for the Coeur d'Alene Tribe's Environmental Health Specialist.

The environmental health specialist was the Coeur d'Alene Tribe's representative to ICHHP and also served as a non-voting liaison to the Hanford Health Effects Federal Subcommittee.

The main goals for the program were to advise the Coeur d'Alene Tribe concerning Hanford issues and to continue to develop general environmental health capacity in accordance with the cooperative agreement with ATSDR.

Work in the Hanford Health Effects Federal Subcommittee (and consequently ICHHP) was ended by ATSDR in 2004.

Smoke in the air from burning fields at sunrise (photo by Jess Marratt).

5.4.5 Housing

The Coeur d'Alene Tribe's Housing Authority and Public Works Department are committed to providing the opportunity for safe, comfortable, high-quality homes for all Tribal member and Native American families. The days of barrel stoves, outhouses, and buckets of spring water are at an end. The days of ice forming on interior walls, doors that will not lock or even close, and roofs that leak like sieves will not be tolerated.

The Tribe has provided diverse opportunities for family housing, including unique variations on the Housing and Urban Development (HUD) model, access to private financing, and low-density development. The Tribe will continue to expand these opportunities until every housing need is met. In 1999, there were currently 238 families on the Tribal Housing Authority waiting list (Coeur d'Alene Tribe 1999b).

The 2000 U.S. Census Bureau indicates that there are 4,015 housing units within the Reservation. Of these, 2,486 units are occupied and 1,529 units are vacant. Of the vacant units, 1,308 are listed as seasonal, recreational or occasional use. Of the 2,486 occupied units, 1,963 are owner occupied and 523 are renter occupied. Only 388 or 9.7% of the 4,015 housing units within the Reservation are owned by American Indian and Alaska natives, according to the Census Bureau.

HUD homes have been the primary source of housing for Tribal members. The cost of housing in this region makes it difficult to obtain suitable housing for the low to very low-income families. In addition, there is an acute shortage of housing to meet the needs of the elderly, handicapped and young families. The housing market is limited and available housing lacks affordability or is in need of rehabilitative work (Coeur d'Alene Tribe 2003a).

5.4.6 Infrastructure: Power/Telecommunications/Transportation

The Tribe and local government are working to expand infrastructure capacities throughout the Reservation. From fire protection to waste water, leaders understand that the current period of growth and development is limited not so much by the size of dreams or number of opportunities, but the capacity of domestic water system and number of emergency responders. Awareness of existing infrastructure is included in every plan and development undertaken by the Tribe. An inter-governmental committee is working to address emergency services; the Tribe and agencies such as Indian Health Service are evaluating wet (water, sewer) utility capacities and a transportation planner is on Tribal staff. Private industries such as Kootenai Electric Cooperative, Avista and Clearwater Power Cooperative supply 'dry' (electric) utilities within the Reservation. Verizon supplies telephone service and Elk River supplies cable service on the Reservation.

The Tribe has secured its own telephone service for Tribal government offices and also provides broadband transmission service on the Reservation. The Tribe is currently expanding the number of households served by the Red Spectrum broadband transmission service through a multi-million dollar fiber optic cable project.

Environmental considerations associated with infrastructure include poor percolation of some area soils, the detrimental impacts of storm water run-off, overuse of ground water resources, pollution from sewer systems and septic systems, health concerns associated with overhead power lines and electrocution of raptors by power lines.

5.4.6.1: Roads/Transportation

Prior to settlement in this area by non-Indians, the Coeur d'Alene people relied on a trail network for foot and horse travel. Since the 1850's, an extensive network of roads has slowly been constructed on the Reservation. Coeur d'Alene Tribal G.I.S. (2003) estimates that today there are a total of 1379 miles of road on the Reservation (2003). U.S. Route 95, and State Routes 3, 5, 97, 58, and 60 are the primary highways on the Reservation. These highways make up a large portion of the 235 miles of paved road. Non-paved roads cover another 1154 miles of surface on the Reservation.

Road mileage is increasing on the Reservation. For example, Lake Creek and Plummer Creek watersheds combined have had 76 miles of forest road constructed from 1974 to 1995 (Coeur d'Alene Tribe 1998b; Krueger 1998c). U.S. Route 95 was recently expanded from a 2-lane highway to a 4-lane highway from Fighting Creek to Worley on the Reservation (Table 5.4.6.1 contains a summary of current roads data from the Tribe's G.I.S. Program as of 2011).

Road construction on Highway 95 (photo by John Hartman).

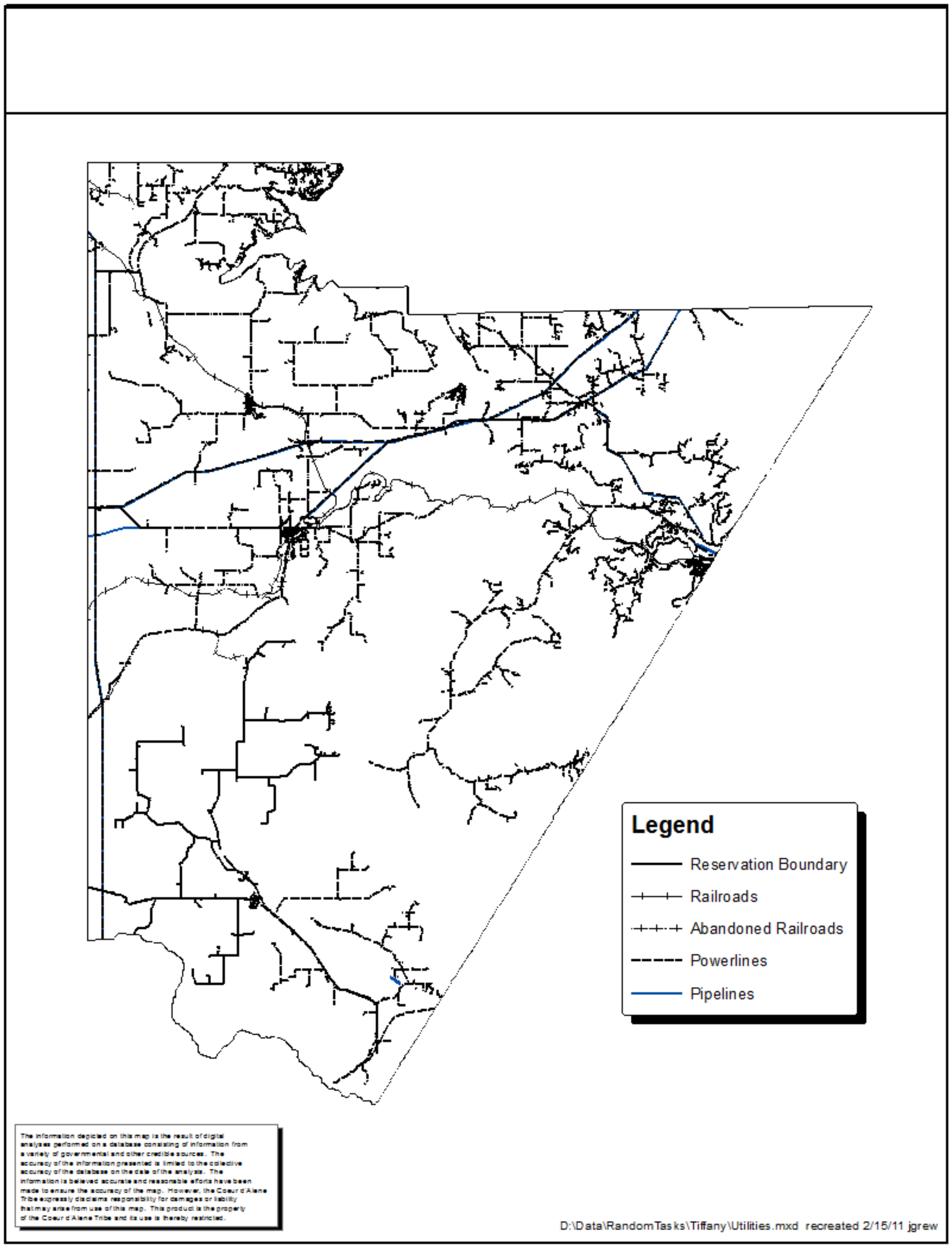
Table 5.4.6.1 Road Miles by Watershed

	Primary	*Secondary*	*Gravel*	*4wd Roads*	*Total Road miles by WS*	*Sq Miles by WS*	*Road Density in miles/ square mile*
Hangman Creek	58.54	129.87	193.18	362.90	744.49	309.05	2.4
Lake Creek	4.97	12.85	19.63	57.62	95.07	33.65	2.8
Plummer Creek	8.08	16.51	42.16	51.67	118.42	43.57	2.7
Benewah Creek	1.13	0.37	45.31	145.09	191.90	53.71	3.6
St. Maries/St. Joe	19.50	40.06	109.25	336.23	505.05	164.97	3.1
CDA Lake	50.15	63.67	199.95	66.00	379.76	231.99	1.6
Total	142.37	263.33	609.48	1019.52	2034.70	837.84	2.4

****These numbers are just estimates and not approximate values, so numbers will not add up in some cases due to human error and spatial extent of the data.

Some forest roads have been decommissioned, but more roads are being built than are being obliterated. Current construction practices tend to reduce sediment delivery, on a per mile basis. However, increased road building will offset any gain made by improved construction. Road densities for each of the Land Management Areas are listed above (note: road miles are calculated by watersheds and include areas both on and off of the Reservation).

The Tribe has incomplete data on railroads, gas, electrical and other utility corridors on the Reservation. What is known is contained in Figure 5.4.6.1.



Legend
Reservation Boundary
Railroads
Abandoned Railroads
Powerlines
Pipelines
The information depicted on this map is the result of digital analyses performed on a database consisting of information from a variety of governmental and other credible sources. The accuracy of the information presented is limited to the collective accuracy of the database on the date of the analysis. The information is believed accurate and reasonable efforts have been made to ensure the accuracy of the map. However, the Coeur d'Alene Tribe expressly disclaims responsibility for damages or liability that may arise from use of this map. This product is the property of the Coeur d'Alene Tribe and its use is thereby restricted.
D:\Data\RandomTasks\Tiffany\Utilities.mxd recreated 2/15/11 jgrew

Figure 5.4.6.1

5.4.7 Pesticides

Agricultural chemicals, including herbicides, pesticides, and fertilizers are widely used across the Reservation. Approximately 28 percent of the lands on the Reservation are used for agricultural production (U.S. EPA 1997). A number of chemicals, including pesticides, herbicides, and fertilizers, are used on agricultural lands.

Chemicals are also used in forest management activities, to control vegetation along transportation and utility corridors, and for indoor and outdoor residential use.

Most commercial agricultural chemicals currently used on the Reservation are classified as slightly to moderately toxic, and most break down quickly in the environment, normally in hours to weeks.

Health effects resulting from exposure to these chemicals are generally short-term and reversible, and may include skin, eye, or respiratory irritation. However, long-term repeated exposure to some chemicals may potentially result in chronic health effects such as chronic dermatitis (skin rashes or increased sun sensitivity), kidney or liver effects, or reproductive effects. Two chemicals, Bronate and Weedar, are suspected carcinogens. Both these chemicals are primarily used on wheat crops, primarily in the fall.

Potential health effects for a number of the chemicals listed in Table 5.4.7.1 include:

Bronate and Buctril Overexposure may cause nausea, vomiting, abdominal pains, weakness, dizziness, and unsteadiness; breathing of vapors may aggravate asthma or pulmonary diseases (MSDS; Integrated Risk Information System [IRIS]).

Chiptox Very high acute exposures may cause slurred speech, twitching, jerking and spasms, low blood pressure, and unconsciousness (EXTOXNET).

Far-Go Acute effects may include eye irritation. Overexposure may produce central nervous system depression and the possibility of headache, dizziness, uncoordination, nausea, and loss of appetite and unconsciousness (MSDS).

Roundup Acute exposure may cause temporary eye irritation, conjuctivitis, and gastrointestinal discomfort. Ingestion of large quantities may cause hypotension and pulmonary edema. Chronic exposure may cause skin irritation (MSDS).

Weedar Weedar is considered a possible carcinogen (MSDS). Acute and chronic effects may include irreversible eye damage. Repeated overexposure may cause liver, kidney, gastrointestinal, and muscular effects. Inhalation of vapor, dusts, or sprays may aggravate asthma or pulmonary diseases (MSDS).

Table 5.4.7.1 Selected agricultural pesticides commonly used on the Coeur d'Alene Reservation.

Chemical[1]	*Use*[1]	*Crops*[2]	*Toxicity*[1]
Bronate	Herbicide	Wheat	Moderately toxic/Probable carcinogen
Buctril	Herbicide	Barley, Bluegrass, Wheat	Moderately toxic/Non-carcinogenic*
Chiptox	Pesticide	Oats, Barley, Wheat	Slightly toxic/Non-carcinogenic*
Curtail	Herbicide	Bluegrass, Lentils	Non-carcinogenic*/ Inconclusive**
Dimethoate	Insecticide	Lentils, Wheat	Moderately toxic/ Inconclusive***
Far-Go	Herbicide	Lentils, Barley, Wheat	Slightly toxic/Non-carcinogenic*
Harmony Extra	Pesticide	Wheat	Slightly toxic/Non-carcinogenic*
Hoelon	Herbicide	Wheat	No carcinogenicity information available
Pursuit	Herbicide	Lentils	Slightly toxic/Non-carcinogenic*
Roundup	Herbicide	Bluegrass, Wheat, Lentils, Fallow	Moderately toxic/Non-carcinogenic*
Weedar	Herbicide	Wheat	Slightly toxic (orally)/highly toxic (eye exposure)/Probable carcinogen

1 Chemical information from Material Safety Data Sheets and EXTOXNET Pesticide Information Profiles.

2 Crop information from Reservation crop reports.

* Non-carcinogenic indicates the chemical is not a known or suspected carcinogen.

** Epidemiology studies have been both positive and negative, the majority being negative.

*** Carcinogenic effects are unlikely.

Based on exposure information from Washington State pesticide incident tracking surveys and case-by-case analysis by the Idaho Department of Agriculture, pesticide exposure is most likely to occur as a result of:

- mixing and loading of chemicals
- inappropriate application or disposal (including aerial drift)
- contact with contaminated media such as surface water, ground water, or foods

For the majority of Reservation residents, the greatest risks from commercial agricultural pesticide contamination may be from exposure to residual contamination from historically-used banned chemicals, such as DDT, which persist in the environment.

In a US Geological Survey water quality assessment conducted in the Palouse region between 1993 and 1995, none of the pesticides commonly used for dryland farming of wheat and small grains in the Palouse region were detected in ground water, but 10 were detected in surface water. A number of these pesticides, including Far-Go, Bucktril, 2,4-D-based, and MCPA-based pesticides are also used on the Reservation under similar conditions and using similar agricultural practices (Coeur d'Alene Tribe 2000b).

5.4.8 Recreation

Northern Idaho, particularly the Coeur d'Alene Lake area, is one of the region's major attractions for tourism. Out of state boaters account for about one-fourth of the 20,000 boats registered in Kootenai County (Coeur d'Alene Tribe, *et al.* 1996). Visitors are drawn to the area for its unique geographical characteristics and the recreation opportunities that they provide. Visitors come from Washington, Montana, Oregon, and Canada, as well as Idaho. Table 5.4.8.1, Recreation Sites, lists some of the recreation available in and near the Reservation.

Table 5.4.8.1, Selected Recreation Sites

Recreation Sites	*Pumpout*	*Campgrounds*	*Public Dock*	*Boat Launch*	*Restrooms*	*Picnic Area*	*Parking*	*Hiking/Trailhead*	*Water Access Only*	*Use Level (Seasonal)*
Windy Bay (BLM)		x	x	x	x	x			x	HIGH
Sun Up Bay			x	x	x		x			HIGH
Rockford Bay (Black Rock Marina)	x		x	x	x		x			HIGH
Chatcolet, day use			x	x		x	x			MODERATE
Plummer Point			x	x	x	x	x			MODERATE
Harlow Point			x	x						MODERATE
Spokane Point			x	x	x					MODERATE
Fuller Landing			x	x						HIGH
Black Lake			x					x		MODERATE
Mowry State Park		x	x		x	x	x	x		HIGH
Conklin Park Marina	x			x			x			HIGH
Mary Minerva McCroskey State Park		x			x	x	x	x		MODERATE
Trail of the Coeur d'Alenes					x	x	x	x		MODERATE
Heyburn State Park	x	x	x	x	x	x	x	x		HIGH

Recreation Activities

The area's recreational activities are mostly associated with the lakes, rivers, and waterways. Camping, fishing, boating (all types of water vehicles), hunting, off road vehicle use, day use, and hiking are the most popular recreation activities on the Reservation. Currently, only at the peak of the season (July-August) are there any crowding, conflicts, and user dissatisfaction.

Recreational use and development contribute to the loss of habitat and affect the natural environment. Recreation around the lakes and waterways is expected to increase due to population growth in the region. Coordination and cooperation are necessary, in addition to long-term planning, to maintain appropriate recreational activities and retention of the natural environment.

5.4.9 Solid and Hazardous Waste

5.4.9.1: Solid Waste

The amount of solid waste and the collection methods for the Reservation are tied together such that this data cannot be separated by type of source (such as residential versus non-residential) without a significantly more intensive effort. For instance, the amount of waste collected from the rural drop boxes in the northern part of the Reservation can be estimated, but these amounts cannot be characterized by specific source (such as residential or commercial). See Table 5.4.9.1 for Reservation dumpster sites and map coordinates (Coeur d'Alene Tribe 2007a). Likewise, there are some drop boxes that are used by off-Reservation sources, even out-of-state sources, but there is no hard data available to adjust for this amount.

Table 5.4.9.1 Reservation PUBLIC Dumpster Sites and Map Coordinates

	GIS/Map Coordinates	
Dumpster Location	*X Coordinate*	*Y Coordinate*
Rockford Bay	507645.719	5261520.500
Sunup Bay Road	503055.584	5260136.500
Worley	506336.281	5250083.500
Heyburn State Park (Chatcolet)	518031.094	5246554.000
Heyburn State Park (Rocky Point)	518988.219	5244402.500
Parkline (Benewah Lake)	524035.000	5242412.000
Harrison Junction	525642.063	5249365.000
North Benewah Creek Road	524466.688	5242006.500
Plummer	513557.063	5242725.000
Windfall Pass Road	507454.781	5231548.500
Hangman Creek Road	500389.375	5226300.000
Sanders	516190.250	5216678.000
Moses Mountain Road	513131.219	5219067.500
Sheep Creek Road	509654.406	5218003.000
South Benewah Creek Road (Lolo Pass Rd)	505453.156	5228733.000

An estimate of the total waste generated on the Coeur d'Alene Reservation ranges from 3,070–5,700 tons per year (Coeur d'Alene Tribe 2002). A more detailed study would need to be completed in order to narrow down the range of the estimate (refer to Table 5.4.9.2 on next page).

Table 5.4.9.2 Estimate of Current Waste Quantities, Coeur d'Alene Reservation

Location or Source	*Collection Capacity or Amount, cubic yards per year*	*Estimated Average Percent of Fullness for Rural Dumpsters*	*Estimated Density, pounds per cubic yds.*	*Estimated Amount, tons per year*
Benewah County, rural dumpsters	28,080	80%	100	1,123
Benewah County, additional dumpsters	4,030	80%	100	161
Benewah County, commercial collections	1,768	80%	120	85
Kootenai County, rural dumpsters	—	—	—	1,946
City of Plummer	1,612	—	500	403
City of Worley	364	—	500	91
City of St. Maries	936	—	500	237
Casino	5,250	—	130	341

Total Waste Generated = 4,387 tons per year
Waste Generation Rate = 0.68 tons (1,360 pounds) per person per year [1]
1360/365 = 3.72 or 3.7 pounds when rounded or 3.7 pounds per person per day
Potential Range of Waste Amount (± 30%) = 3,070 - 5,700 tons per year

Notes:
[1] The Waste Generation Rate was calculated using the current population figure of 6,451 people.
cy = cubic yards.

Currently, there are few opportunities for recycling on the Coeur d'Alene Reservation. This is typical of much of the surrounding areas and is also typical of rural areas in general, but clearly more could be done locally. Recycling is an activity that benefits significantly from "economies of scale" that result from handling large volumes of material, and this is true for the waste generators (commercial and residential) as well as the companies that collect recyclable materials. This factor has handicapped previous efforts and, unfortunately, this also means that any new recycling programs are limited to those efforts that would target larger volumes of materials in order for these programs to be cost-effective.

For the alternatives that were evaluated, curbside recycling (for households) and mandatory programs appear unfeasible. Commercial programs and possibly a limited drop-off program could be feasible.

The Tribe conducted assessments of selected solid waste sites on and adjacent to the Coeur d'Alene Reservation. Site visits to selected locations occurred in August and November 2001. Table 5.4.9.3 lists the name, location, and assessment status of the sites within the project scope of work.

Table 5.4.9.3 Abandoned Landfill Assessment Sites

Site Name	*Location*	*Comments*
DeSmet Road Dump Site*	503854.875 5222082.000	Additional assessment recommended.
Old DeSmet Town Landfill*	503738.250 5221751.500	Monitor environmental condition.
Sanders Auto Crushing Site*	514723.281 5216444.500	Additional assessment recommended.
Zurcher Mountain Auto Wrecking	502352.531 5240147.000	Additional assessment recommended.
Little Plummer Creek Dump Sites*	512761.625 5242248.000	Monitor environmental condition.
Benewah Co./St. Maries Landfill*	538476.938 5237192.000	Monitor environmental condition.
Old Plummer Town Landfill*	507283.625 5237434.000	Monitor environmental condition.
Old Tensed Town Dump	502994.094 5224663.000	Monitor environmental condition.
Old Worley West Town Dump	501593.188 5247924.000	Additional assessment recommended.
Old Worley Town Dump on Indian Cemetery Road*	506946.781 5250460.000	Additional assessment recommended.
Old Sanders Town Dump	517108.406 5218176.000	Monitor environmental condition.
Wilbur Ellis Ag-Chem at Tensed	504775.906 5223846.000	Additional assessment recommended.
Haeg Road at Mowry Road Dump	501484.188 5239147.000	Drive by. Only minor debris visible from Haeg Road.
Borrow Pit Dump North of Plummer	Map: NW1/4 SW1/4 Sec 8 T46N, R4W	No assessment attempted.

Site Name	*Location*	*Comments*
King Valley Post & Pole	Map: N1/2 Sec 35 T44N R5W	Assessment attempted but was not able to locate site.
Auto Wrecking North of Lolo Creek	Map: NE1/4 NW1/4 Sec 25 T45N R5W	No assessment attempted.
Sheep Creek Dump Site	Map: NW1/4 NW1/4 Sec 5 T43N R4W	No assessment attempted.
Conkling Road Gravel Pit Dump Site	Map: SW1/4 SE1/4 Sec 21 T47N R4W	No assessment attempted.
Windfall Pass Dump Site	Map: SE1/4 SE1/4 Sec 16 T45N R4W	No assessment attempted.
Brown Hill Dump Site	Map: NE1/4 SE1/4 Sec 14 T46N R3W	No assessment attempted.
Old Harrison Dump	Map: E1/2 NE1/4 Sec 14 T47N R3W	No assessment attempted. Kootenai Co. Plng Dept: #C-1059–01

* Designates a site included within the six sites originally selected for assessment.

For the following sites, the Tribe concluded risk to human health and the environment was relatively low. Until and unless adverse environmental conditions become apparent on Reservation land in a downgradient direction from these sites, no further investigation is warranted.

- Little Plummer Creek Dump sites
- Benewah Co./St. Maries Landfill
- Old Plummer Landfill
- Old Tensed Town Dump
- Old Sanders Town Dump

Suggested follow-up at several sites is administrative in nature. At the following sites, we concluded risk to human health and the environment was relatively low. However, recent site activity demonstrated that inappropriate site use was still occurring.

- Old Worley West Town Dump
- Old Worley Town Dump on Indian Cemetery Road

For the following sites, we concluded that risk of a release to waters of the Reservation was high or potentially high. For these sites, there is a present and significant need for additional assessment to determine the extent of potential adverse impact.

- DeSmet Road Dump Site (cleaned up by the Coeur d'Alene Tribe in 2005)
- Old DeSmet Landfill
- Sanders Auto Crushing Site
- Zurcher Mountain Auto Wrecking
- Wilbur Ellis Ag-Chem Warehouse

5.4.9.2: Hazardous Waste

Hazardous waste is typically defined as waste material that is ignitable (i.e., burns readily), corrosive, or reactive (e.g., explosive) and may be solid, semi-solid, or liquid. Known or suspected hazardous waste sites are regulated by the Resource Conservation and Recovery Act (active sites), or the Comprehensive Environmental Response, Compensation, and Liability Act, also known as "Superfund" (inactive or abandoned sites). Hazardous wastes related to mining activities in the Coeur d'Alene Basin are not discussed in this report.

The number of identified hazardous waste generators on the Reservation is fairly small. The federal database for tracking active hazardous waste sites includes twenty-one facilities on the Reservation that may be generators, transporters, treaters, storers, or disposers of hazardous waste. Three facilities are located in Worley, six facilities in Plummer, two facilities in Tensed and ten facilities in St. Maries. Most facilities are maintenance, repair, salvage, agricultural, lumber businesses, or railway-related businesses (U.S. Environmental Protection Agency 2011c). However, one of the facilities located in St. Maries was a log yard and has been identified as a source of hazardous wastes from wood treatment activities which may be migrating into surface or ground water (Coeur d'Alene Tribe 2000b).

5.4.10 Land Use

For the Coeur d'Alene Tribe, historic land use consisted of areas for hunting, fishing, gathering and spiritual uses. Villages were located along the shores of Coeur d'Alene Lake, Spokane River, and the St. Joe River. Trails systems throughout the Tribe's aboriginal territory were travel routes to the salmon fishing areas, the buffalo hunting areas, and routes to established areas for trading with the Kootenai, Palus, and Nez Perce (Frey and the Schitsu'umsh 2000).

Today, land use on the approximately 345,000 acre Coeur d'Alene Reservation includes hunting, fishing, gathering, Tribal spiritual uses, residential, commercial, agriculture, forestry, recreation, utility distribution, and transportation. Tribal hunting, fishing, gathering and spiritual uses of the land are increasingly limited and threatened by other uses of the land such as residential, commercial, agriculture, forestry, recreation, utilities and transportation. The Reservation boundaries overlap with Kootenai and Benewah County boundaries.

According to Tribal GIS, current land use consists of 176,021 acres of forest land, 141,671 acres of agricultural land, 2,466 acres of brush land, 2,245 acres of developed land (associated with towns on the Reservation), 608 acres of wetlands, 372 acres of grassland, and 11,088 acres of barren or unclassified lands (not including Tribal submerged lands).

5.4.11 Social and Economic Considerations

Historically, the Coeur d'Alene social organization consisted of three bands corresponding to the winter village sites. Each band comprised several extended families each functioning on their own or in alliance with each other. There were no hereditary clans, class structure, or slavery. Leadership consisted of the elected chiefs and subchiefs with no coercive or punitive powers (Frey and the Schitsu'umsh 2000).

The economics of the Tribe consisted of the accumulation of subsistence items. However, with the coming of the horse, Coeur d'Alene families regularly traveled with members from other tribes to distant hunting and fishing grounds establishing and renewing trading partnerships.

It has been estimated that the pre-settlement population of the Coeur d'Alene Tribe was approximately 5,000 (Frey and the Schitsu'umsh 2000).

This population was sustained by the natural resources from a much larger land base (over 5 million acres of what is now parts of Idaho, Washington and Montana). Disease, war and other factors brought about by European settlement resulted in a precipitous decline in the native population. At its lowest, the population of the Coeur d'Alene Tribe was down to 500 people. It has currently rebounded to approximately 2299 enrolled Tribal members (Coeur d'Alene Tribe 2011).

Populations of European descendants have increased substantially. At the larger scale, the total human population in Benewah and Kootenai counties is 117,856. This represents an increase of around 112,000 people within a portion of the land area once occupied by Coeur d'Alene people. Not only has the number of people increased, but also modern lifestyles create much greater, and long-term impacts to the environment.

The Coeur d'Alene Tribe continues to be self-governing, with a Tribal Council that answers to a constituency of Tribal members in its effort to meet their needs and perform the duties of elected office. The Coeur d'Alene Tribe and their elected Tribal Council are committed to providing for the health and welfare of Tribal members and Reservation residents, and careful and progressive planning to sustain the Tribe's self-determination and restore its self-sufficiency.

5.4.11.1: Existing Social Conditions

The goal of the Quality of Life Sub-Group in the Tribe's EAP Assessment report was to assess and describe the impacts of twenty-five environmental concerns on the community's quality of life. During this assessment these criteria became known as the "Categories for Quality of Life*.*" As these five categories are typically interdependent, no one category was understood as primary to or more important than the others, which is evident in the "circle diagrams" developed for each topic. The categories are:

- Economic and Subsistence
- Spiritual/Moral
- Aesthetics
- Community Well-being
- Personal Well-being

The last two categories were incorporated into the definition of quality of life to acknowledge the distinction between “community” and “personal” well-being, and that some individuals may express their “economic/subsistence,” “spiritual/moral,” and “aesthetic” quality of life concerns along a continuum from “community well-being” at one end to “personal well-being” at the other end. Other criteria evaluated included impacts on Tribal culture, degree of uncertainty, trends, seasonal differences in severity of impacts, impacts on future generations and fairness/equity of impacts.

Given the general lack of documented research on the community’s quality of life, the sub-group elected to pursue its own primary research. Aware of the need to gauge both the “subjective” meanings often associated with the phrase “quality of life,” as well as the “objective” interplay of “natural and environmental resources and economics,” the sub-group sought methodologies that were both qualitative and quantitative in nature. The EAP Assessment approach relied primarily on the use of a focus group (qualitative in nature) and an economic analysis (quantitative in nature). In addition, interviewing a limited sample of community members and conducting public opinion surveys supplemented the information obtained in the focus group sessions.

5.4.11.2: Existing Economic Conditions

The Economy of the Coeur d’Alene Reservation

1. Socioeconomic Characteristics of the Entire Population of the Coeur d’Alene Reservation in the Year 2000

This section begins by describing the socioeconomic characteristics of the entire population residing on the Coeur d’Alene Reservation, combining both the 81 percent non-Indians with the 19 percent Native Americans. The 2000 Census is the source of this information.

- Between 1990 and 2000 the population of the Coeur d’Alene Reservation grew by 13.4 percent. This was a slightly slower rate of population growth than Benewah County (15.5 percent) and much slower than Kootenai County (55.7 percent). *Almost two-thirds of the Reservation population growth was associated with the more rapid growth of the Native American population. While the Native*

American population grew by 65 percent, the non-Indian population grew by only 5.5 percent.[1] By comparison, the population of Idaho increased by 28.5 percent and the nation by 13.1 percent.

- Census data indicates that employment on the Reservation grew by 18 percent between 1990 and 2000. *The employment of Native American residents almost doubled while that of non-Indians grew by only 10 percent over that ten-year period.*
- With the impact of inflation removed, income per person and median family income both rose by about 20 percent between 1990 and 2000 on the Reservation. *The rate of increase for Native American households was much higher than for non-Indians. Native American income per person rose over 50 percent faster, median household income twice as fast, and median family income three times as fast as it did for non-Indians.* Despite this improvement, per capita income and median household income on the Reservation were only about 92 percent of the overall Idaho level. Despite the faster rate of growth of real income among the Native American residents of the Reservation, significant income gaps remain between Native American and non-Indian residents. Depending on the income measure used, Native American residents had incomes 7 to 39 percent below non-Indians.
- The poverty rate on the Reservation declined somewhat between 1990 and 2000 from 16.3 to 15.6 percent. *The poverty rate among Native American residents declined much more rapidly, by almost 30 percent, while poverty among non-Indian residents was largely unchanged.* The poverty rate on the Reservation, however, remained above the Idaho level of 11.8 percent. Poverty rates among Native American residents were significantly higher; in general twice as high.

[1] It is possible that some of the growth indicated by comparing the 1990 and 2000 Census figures is tied to a significant under-count in 1990 and a more accurate count in 2000.

- The largest source of employment for Reservation residents was professional services (health, education, social services), which employed 542 residents. Trade was the source of 360 jobs. Travel and entertainment-related jobs totaled 321. In contrast, all of manufacturing, including wood products, provided 268 jobs, while agriculture, forestry, and mining provided employment for 266. Government (public administration) employed 260. See Table 5.4.11.1.

Table 5.4.11.1

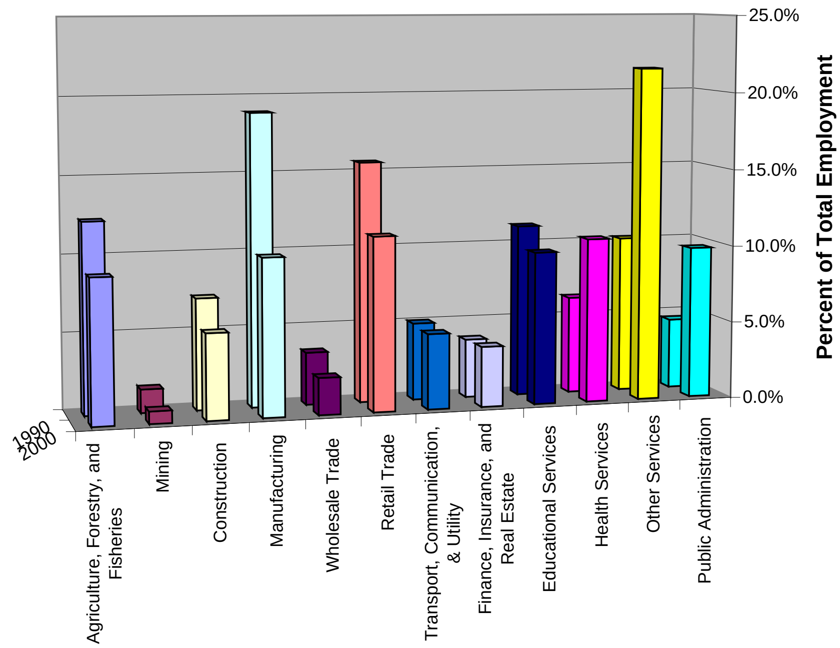
Industry of Employment, Coeur d'Alene Reservation 2000		
Industry	Number of Workers	% of All Workers
Educational, health and social services	542	20.5
Arts, entertainment, recreation, accommodation and food services	321	12.1
Retail trade	297	11.2
Manufacturing	268	10.1
Agriculture,Forestry & Mining	266	10.1
Public administration	260	9.8
Construction	146	5.5
Transportation and warehousing, and utilities	129	4.9
Professional, scientific, management, & administrative services	121	4.6
Other services (except public administration)	106	4
Finance, insurance, real estate, and rental and leasing	103	3.9
Wholesale trade	63	2.4
Information	23	0.9
Total	2645	100

Sources: 2000 Census

This structure of Reservation employment represented a significant change from 1990 when manufacturing, forestry, and agricultural activities were much more important, and services and government much less important as sources of employment. See Figure 5.4.11.1.

Figure 5.4.11.1

ange in the Industrial Structure of Employment
on the Coeur d'Alene Reservation, 1990-2000



The age structure of the Reservation population was older than that found in either the nation or Idaho. The median age on the Reservation was 38.2, five years older than in Idaho and three years older than in the nation. That older age structure is entirely due to the non-Indian population that had a median age of almost 42. *The Native American population on the Reservation is unusually young, with a median age of only 23.5; almost 10 years younger than Idaho and 12 years younger than the national population.* While 42 percent of the Native American population is under 18 on the Reservation, only 26 percent of the national population is that young, a figure close to that of the non-Indian portion of the Reservation population. Similarly, while only about 6 percent of the Native American population is 65 or over, 12.4 percent of the national population is that old, but significantly more of the non-Indian Reservation residents, 15.1 percent, are senior citizens. See Table 5.4.11.2.

Table 5.4.11.2

Age Structure of the Population, 2000 Coeur d'Alene Reservation			
Age Group	All Resdidents	Native American	Non-Indian
% under 5	7.0%	13.0%	5.6%
% under 18	28.3%	41.8%	25.2%
%under 24	35.1%	52.1%	31.1%
% 24-64	51.6%	42.0%	53.8%
% 65 and over	13.3%	5.8%	15.1%
Median Age	38.2	23.5	41.7

Source: 2000 Census

2. Socioeconomic Characteristics of the Native American Population of the Coeur d'Alene Reservation

a. Employment

The number of Native American residents of the Reservation who reported themselves to be employed at the time of the 2000 Census was twice that reported in the 1990 Census. A larger number of Native American residents reported being employed during 1999 and that number was also significantly larger than what was reported for 1989: 55 percent larger. The number of Native American residents reporting that they usually worked 35 or more hours per week during 1999 also increased dramatically over 1989: by 74 percent.

Despite these employment gains, Native Americans are still under-represented in the Reservation workforce. Although 19.1 percent of the population of the Reservation is Native American, only 15.2 percent of the Reservation workforce is Native American. This is due to several demographic and economic circumstances: Because the Native American population has a larger percentage of children, a small percentage of the population is working age. In addition, fewer working-age Native Americans are actually working due to a much higher unemployment rate.

While 82.7 percent of the non-Indian population is 16 years or older, only 63.1 percent of the Native American population is. Thus the "working-age" segment of the Native American population is significantly smaller. Put the other way around, the percentage of the Native American population that are young dependents is significantly larger. We would expect this to depress the percentage of the population working.

Of those Native American residents who are 16 and older, a slightly smaller percentage are employed, 50.9 percent versus 53.6 percent for non-Indians. This is entirely due to a higher unemployment rate among Native Americans who seek employment but cannot find it: 18.8 percent versus 11.6 percent for non-Indians. A larger percentage of working-age Native Americans actually seeks work than do Reservation non-Indians: 62.7 versus 60.8 percent. This is largely due to a higher labor force participation rate among Native American women than among non-Indian women: 60 versus 56 percent. See Table 5.4.11.3.

Table 5.4.11.3

Unemployment on the Coeur d'Alene Reservation, 2000

	Native American			Non-Indian		
	Working-age not working	Seeking work not finding it*	Working-age not seeking work	Working-age not working	Seeking work not finding it*	Working-age not seeking work
	%	%	%	%	%	%
Male	49.9%	23.6%	34.4%	45.5%	16.5%	34.7%
Female	48.5%	14.7%	39.7%	47.3%	5.7%	44.0%
Total	49.1%	18.8%	37.3%	46.4%	11.6%	39.2%

*The "unemployment rate."

Source: 2000 Census. Non-Indian approximated by "white."

Not only do a larger percentage of working-aged Native American residents seek work, but those Native American residents who find it are also more likely than non-Indians to work full-time, year-round. 54 percent of Native American workers fell into this category while only 47 percent of non-Indians did. This is entirely due to the fact that 65 percent of female Native American workers worked full-time, year-round, while only 37 percent of female non-Indian workers were in this category. If the seasonal character of many jobs is ignored and we only focus on whether, when working, workers usually worked 35 or more hours a week, significantly more Native American workers fell into this category than did non-Indian workers. See Table 5.4.11.4.

Table 5.4.11.4

Full-Time Workers, Coeur d'Alene Reservation, 2000		
	Native American	Non-Indian
Worked In 1999	520	2,784
Usually Worked 35+ hr/week	460	2,147
Worked Full-Time, Year Round	282	1,270
% Usually Worked 35+hr/week	88.5%	77.1%
%Full-Time, Year Round	54.2%	45.6%

Source: 2000 Census

The 2000 Census data released through June 2003 did not provide data on the distribution of Native American employment on the Reservation among industries and occupations. So nothing current can be said about *where* Native American residents worked or what types of jobs they held.

Income

Median household income for Native American residents of the Reservation was about 7 percent below that for all Reservation residents. Income per Native American person, however, was almost 40 percent below the average across the entire Reservation population. These two divergent measures of Reservation income allows one to argue either that Native Americans are more or less doing as well as other residents or to argue the opposite, that Native Americans face a staggering income deficit compared to other Reservation residents. See Table 5.4.11.5.

Table 5.4.11.5

Income Levels on the Coeur d'Alene Reservation 1999			
Measure of Income	All	Nat.Amer.	NatAmer/All
Median Household Income	$ 34,988	$ 32,619	93.2%
Average Household Income	$ 43,223	$ 35,389	81.9%
Median Family Income	$ 40,267	$ 36,563	90.8%
Per Capita Income	$ 16,421	$ 10,023	61.0%

Source: 2000 Census

One important explanation of the divergence between these two income measures was discussed above. Many more of the Native American residents are children who are not of working age. When income per person is calculated, income is spread across all residents, whether they are children or retired elderly residents. When household income is calculated, the size of the household is ignored. As a result, the presence of dependents does not reduce the average or median but the presence of more than one worker can boost both measures.

Native American households were almost 30 percent larger than the average for all Reservation households in 2000: 3.4 v. 2.6 persons per household. Those additional household members are likely to be children. Native American households are much more likely to have children under 18 years old present. 71 percent of Native American families on the Reservation fell into this category while only 47 percent of all Reservation families had children present. See Table 5.4.11.6.

Table 5.4.11.6

Types of Households on the Coeur d'Alene Reservation, 2000		
Family Type	% of All Families	% of Native American Families
Families with related children <18 yr	46.9%	70.1%
Married-Couple Family	81.4%	54.0%
Single-Parent Family	18.6%	41.8%
Female householder w/o husband	10.9%	31.2%
Household Type	% of All Households	% of Native American Households
Family Household	73.9%	80.2%
Non-Family Household	26.1%	19.8%
Single person household	21.3%	17.0%
Multi-person non-family household	4.8%	2.8%

Source: 2000 Census

This larger Native American household size by itself explains 21 percentage points of the 39 percentage point gap in per capita income: Average income per Native American *household* is 82 percent of the Reservation average while average income per Native American *person* is 61 percent of the Reservation average.

The remainder (about half) of the 39 percentage point gap in per capita income between Native American residents and the overall Reservation population was due to Native American households receiving fewer dollars of income. A significant part of this gap may be explained by the greater prevalence of single-parent families, especially female-headed households, among the Native American residents. The percentage of female-headed

Native American households was almost three times as large as for the Reservation as a whole. See Table 5.4.11.6. This is likely to reduce family income for two reasons: First, in such households there are fewer workers and, second, women, in general, get paid less than men.

In fact, in 2000 on the Reservation, married couples with children under 18 had a median family income of $47,284. Female-headed households who had children under 18 present had a median family income of $17,143, almost two-thirds lower.

The lower income for Native American households is partly tied to the fact that male full-time Native American workers have a median pay that is only 75% of what non-Indian workers get paid. On the other hand, female Native American workers actually earn 10 percent more than non-Indian women workers. For those Native Americans who work part-time or seasonally, both male and female pay is well below that of non-Indians (72% and 58% of non-Indian levels, respectively).

In addition, fewer male Native American workers work full-time year-round (41% v. 53%) but many more female Native American workers work full-time, year-round (almost twice as many, 65% v. 36%). See Table 5.4.11.7.

Table 5.4.11.7

Coeur d'Alene Reservation
Median Earnings by Work Status, 1999

	Non-Indian	Native American	NatAmer/ Non-Ind
Worked full-time, year-round in 1999 –			
Total	$30,719	$25,294	82.3%
Male	$35,369	$26,591	75.2%
Female	$21,906	$24,063	109.8%
% Male workers full-time, all year	53%	41%	78.5%
%Female workers full-time, all year	36%	65%	179.7%
Worked part-time or seasonal in 1999			
Total	$9,877	$7,935	80.3%
Male	$13,750	$9,926	72.2%
Female	$7,912	$4,609	58.3%

Source: 2000 Census. "Non-Indian" approximated by "white."

The lower Native American household income is also tied to the fact that a slightly larger percentage of the Native American potential workforce (those 16 and older) are *not* working 49.1% v. 46.4% for non-Indians. This is entirely due to the higher unemployment rate among Native American residents who are seeking work, 18.8% v. 11.6% for non-Indians. A larger percentage of the working-age Native American residents actually seek work, 62.7% v. 60.7% for non-Indians. While the labor force participation rate of male Native American residents is about equal to that of non-Indians, that of female Native American residents is significantly higher than non-Indians, 60.3% v. 55.9% for non-Indians.

Using median incomes instead of average incomes also tells a somewhat different picture. The *median* household income for Native American households is 93 percent of the median for all Reservation households, but the *average* Native American household income is only 82 percent of the Reservation average. This is largely due to the fact that while the median and average are close to one another for Native American households, the *average* household income for all residents is 24 percent higher than the *median* for all households. This suggests that a disproportionate share of aggregate income goes to upper income non-Indian households on the Reservation while income is distributed more evenly among Native American households.

The biggest differences in the distribution of income among Native American and non-Indian households are at the upper and lower ends of the distribution. The percentage of Native American households with incomes less than $10,000 was 72 percent higher than for non-Indian households. At the upper end of the distribution, the share of Native American households with incomes in excess of $70,000 was only about half the share of non-Indian households. See Table 5.4.11.8.

Table 5.4.11.8

Distribution of Household Income on the Coeur d'Alene Reservation, 1999			
Income Category	Percent of all **Native Amer** Households	Percent of all **Non-Indian** Households	Ratio Native Amer. to Non-Indian
<$10K	16.2%	9.4%	1.72
$10-20K	17.0%	16.5%	1.03
$20-30K	14.4%	15.9%	0.91
$30-40K	17.3%	13.7%	1.26
$40-50K	9.7%	11.9%	0.82
$50-60	11.3%	10.9%	1.03
$60-75	6.3%	7.7%	0.81
$70-100	4.7%	7.4%	0.64
$100+	3.1%	6.7%	0.47

Source: 2000 Census

Poverty rates on the Reservation were twice as high among Native Americans as among non-Indians for all age groups except for those under 5 and over 75[2]. As a result, while making up only 19 percent of the total population, Native Americans make up 34 percent of those living in poverty. See Table 5.4.11.9.

Table 5.4.11.9

Poverty Rates by Age Group: Coeur d'Alene Reservation, 1999				
Age Group	Native Amer.	Non-Indian	All	NatAmer/Non-Indian
All Ages	28.5%	12.7%	15.6%	2.2
Under 5 years	41.9%	25.5%	31.3%	1.6
5 years	13.3%	25.5%	22.6%	0.5
6 to 11 years	33.3%	16.6%	19.9%	2.0
12 to 17 years	29.9%	14.7%	18.7%	2.0
18 to 64 years	27.2%	11.5%	14.2%	2.4
65 to 74 years	10.8%	4.1%	4.8%	2.6
75 years and over	0.0%	16.2%	14.9%	0.0

2000 Census

The educational attainments of Native Americans on the Reservation are more "polar" than that of non-Indians: A smaller percentage of Native Americans have graduated from high school but a larger percentage have some college education (but fewer actually have a bachelors degree or better). See Table 5.4.11.10.

Educational Attainment on the Coeur d'Alene Reservation		
Educational Level	% of Age 25+	
	Native Amer.	Non-Indian
Not a High School Graduate	26.3%	13.9%
High School Graduate	25.1%	37.0%
Some College	42.9%	31.6%
Bachelor's degree or better	5.7%	17.5%

Source: 2000 Census

2 The lower reported poverty rates for these groups may be due to errors in the data.

The Native American population of the Reservation showed more mobility between 1995-2000 than the non-Indian residents. While a third (32.6%) of Native Americans had moved their residence across county lines, only about a fifth (21.5%) of non-Indians had. Of these, 19 percent of Native Americans had moved to the Reservation from a different state while 14.7 percent of non-Indians had moved across state lines.

c. The Economic Role of The Coeur d'Alene Tribal Government[1]

The Coeur d'Alene Tribal Government plays a very important role in the Reservation's economy. Tribal employment associated with managing the Reservation's natural resources and the flow of lease payments from agricultural and forest lands to the Tribe and Tribal members is a major source of employment and income.

Between 1995 and 1997 timber stumpage, agricultural leases, and crop sales brought an average of $1.3 million into the Tribal general fund, providing the funds for a fifth to a quarter of the general fund expenditures. The Tribe also receives numerous contracts and grants to manage the Reservation's natural resources. Between 1995 and 1997 these averaged $1.9 million, representing almost 30 percent of the Tribe's Special Fund. The sum of these two types of natural resource-related incomes to the Tribe was $3.2 million annually.

The employment directly associated with these budgets is significant. The Natural Resource Department employed 64 people in 1998. The natural resource income flowing into the general fund supports other jobs. If a quarter of the Tribal administration jobs outside of natural resources are supported by natural resource funds, another 24 jobs can be attributed to these funds for a total of 88 jobs. The Coeur d'Alene Tribal Government estimates that two-thirds of Tribal administrative employment is held by Native Americans and 45 percent by Coeur d'Alene Tribal members.[2] These percentages would suggest that natural resource income is responsible for 60 jobs for Native Americans and 27 jobs for Tribal members. Clearly this economic connection

[1] This section is taken from a report prepared by Dr. Thomas Power in 1999 for the Coeur d'Alene Tribe's Environmental Action Plan Project entitled "The Importance of Natural and Environmental Resources in the Economy of the Coeur d'Alene Reservation."

[2] Confidential employment information.

with the Reservation's natural resource base is more important than the direct employment in mills and on farms.

In addition to this economic connection through Tribal employment, individual Tribal members also receive agricultural lease and timber stumpage payments from their individual allotments that are held in trust. In 1997 almost $5 million in crops were produced on allotted lands.[3] A third of this or about $1.7 million flows directly to individual Tribal members or members of other tribes who have shares in allotments on the Coeur d'Alene Reservation. In addition, another $775,000 in stumpage payments on timber sold from allotted lands is paid to individual Tribal members each year.[4] In addition per capita payments to Tribal members are supported by revenues from the Tribal business operations. Those include both the Tribal casino and revenues flowing from the sale of Tribally-owned natural resources.[5] All of these payments to Tribal members do not, of course, flow only to those living on the Reservation. The Coeur d'Alene Tribe estimates that approximately 47 percent of Tribal members reside off of the Reservation. Approximately 875 out of 1,875 Tribal members live off of the Reservation and approximately 1000 live on the Reservation.[6]

It is important to note that not all of the revenues flowing to the Tribe as a result of its management of the Reservation's natural resources are tied to the harvest or extraction of commercial resources. Many of the grants received by the Natural Resource Department are associated with managing non-commercial, environmental resources such as wildlife, wetlands, water quality, recreation, and other aspects of environmental quality. With the U.S. Supreme Court's recent official acknowledgment of Tribal ownership and responsibility for the management of the lower third of Coeur d'Alene Lake and parts of the St. Joe River, these environmental management responsi-

[3] The Tribal Farm is not included in these totals. It is assumed that income from that enterprise flows directly into the general fund or is reported as part of the revenue of the enterprise itself.
[4] This is the average over the 1992-1998 period and is based on 90 percent of the timber sold from allotted lands. During 1998 it was much higher, $1.4 million. In 1993 it was only about $45,000. The data is from the Tribal Forestry Department.
[5] In 1994, for instance, it was natural resource revenues rather than gaming revenues that supported the per capita payments.
[6] Coeur d'Alene Tribe Enrollment Office 2003; personal communication with Richard Mullen of the Tribal Enrollment Office 2003.

bilities of the Tribal government will only expand. In addition, those Tribal departments responsible for the management of trust lands are not focused exclusively on the flow of commodities. The forestry program, for instance, is not focused solely on the harvest of trees and the maximization of revenue from trust lands. Its overall purpose is the long-term protection and management of the forestlands for the whole set of values associated with the forests. The management of the agricultural lands also has an environmental component.

The importance of Tribal government as a source of employment for Native Americans on the Reservation was confirmed by the 1990 Census which estimated that 40 percent of Native American employment on the Reservation was in professional services and public administration. Only 25 percent of Other American employment was in these fields; only 24 percent of total employment in Benewah County was in these fields.

The draft 1998 Comprehensive Plan's estimates of employment on the Reservation also confirm the importance of employment related to Tribal government activities. It estimated the total employment created by the Tribe, directly and indirectly, to be over 500. With the growth in Casino employment to 438 in 1998, the total employment directly created by the Tribe was over 700. That represented 40 percent of the total employment on the Reservation. Over 60 percent of these Tribal-generated positions were estimated to be filled by Native Americans.[7]

The importance of Tribal government programs as a source of skilled employment is also reflected in the occupational structure of Reservation employment. Table 5.4.11.11 below summarizes the occupational data reported in the 1990 Census for the Coeur d'Alene Reservation, which is used here in the absence of similar 2000 Census data.

[7] Tables II, III, and IV of the Employment and Labor Force Characteristics chapter of the 1998 Draft Comprehensive Plan adjusted to use the most recent tribal employment data: an additional 229 tribal employees (438 Casino employees rather than 245 and 64 Natural Resource employees rather than 28).

Table 5.4.11.11

Occupations of Coeur d'Alene Reservation Workers, 1990 Census	Coeur d'Alene Reservation Native American	Coeur d'Alene Reservation Other American	Benewah Co. Total	Kootenai Co. Total
Executive, Admin, Manager, Professional, Technical	18.5%	19.3%	17.9%	38.4%
Sales, Administrative Support, Clerical, Protective & Other Services	50.0%	31.0%	32.0%	41.4%
Farming and Forestry	8.0%	13.1%	10.8%	3.7%
Craft, Repair, Operators, Assemblers, Transportation & Moving	18.5%	30.5%	31.9%	24.2%
Handlers, Cleaners, Laborers	5.0%	5.6%	6.5%	3.9%

Note that Native Americans on the Reservation were reported to be about as numerous in the executive, administrative, managerial, professional, and technical categories as others on the Reservation. In addition, the Native American representation in these higher skilled categories was above that for Benewah County as a whole. The greater shift towards higher-level services in the Coeur d'Alene area is clear in the much higher percentage of its workforce in these categories. The other differences in the Native American occupational structure on the Reservation are also likely to be tied to the importance of Tribal government programs. Native Americans on the Reservation are much more likely to be in the "white collar" jobs of administrative support, clerical, sales, protective and other service jobs than other Reservation workers. Similarly, Native Americans on the Reservation are less likely to be in the blue collar, farming, and forestry jobs.

The relative importance of Tribal government as a source of employment for Native Americans on the Reservation may be looked upon by some as unbalanced and insupportable over the long run because government employment is looked upon as, in some sense, less "real" or less economic. That view, however, ignores the role of Tribal government in managing the Reservation's landscape, natural resources, environmental, and social quality on which the entire population of the Reservation relies. Native Americans make up only about 19 percent of the total Reservation population.[8] The Tribal government can be seen as providing services that are important to a total

[8] 2000 Census.

population that is five times the Native American population. In that perspective, the size of Tribal government programs and the employment they provide to Native Americans do not appear to be disproportionately large.

In a study by University of Idaho Professor Dr. Steven Peterson, completed in 2010 for 2008-2009, Tribal government alone, without including Tribal gaming or Tribal enterprises, contributed to the regional economy a total of $78.7 million in sales, $41.4 million in wage and salary earnings, employment of 1,025, and additional government revenues of $1.5 million from indirect business taxes (Coeur d'Alene Tribe 2010b).

d. Changes in Economic Conditions on the Reservation: 1990-2000 Table 5.4.11.12 shows the changes that have taken place in various measures of the economic conditions on the Coeur d'Alene Reservation between 1990 and 2000.

Table 5.4.11.12

Changes in Economic Conditions on the Coeur d'Alene Reservation, 1990-2000

Economic Measure	Native American 1990	Native American 2000	Non-Indian* 1990	Non-Indian* 2000	Nat Amer/Non-Indian 1990	Nat Amer/Non-Indian 2000	Percent Change 1990-2000 Nat Amer	Percent Change 1990-2000 Non-Indian*
Income Measures ($ values in constant 2000 $s)								
Per Capita Income	$7,597	$10,023	$13,900	$16,421	0.55	0.61	31.9%	18.1%
Average Household Income	$30,903	$33,778		$43,187		0.78	9.3%	
Median Household Income	$23,280	$32,610	$28,907	$34,988	0.81	0.93	40.1%	21.0%
Median Family Income	$22,947	$36,563	$33,100	$40,267	0.69	0.91	59.3%	21.7%
Poverty Rate	40.0%	28.5%	12.7%	12.7%	3.16	2.24	-28.8%	0.2%
Educational Attainment, age 25+								
% High School Graduate	26.1%	25.1%	36.7%	37.0%	0.71	0.68	-3.8%	0.8%
% Some College	39.1%	42.9%	30.7%	31.6%	1.27	1.36	9.7%	2.9%
% Bachelor Degree or higher	5.2%	5.7%	12.5%	17.5%	0.42	0.33	9.6%	40.0%
Employmnet Measures								
Number employed at time of Census	200	402	2,035	2,243	0.10	0.18	101.0%	10.2%
Number employed during previous year	335	520	2,617	2,797	0.13	0.19	55.2%	6.9%
Usually worked 35+ hours/week	264	460	1,948	2,147	0.14	0.21	74.2%	10.2%
Population Measures								
Number of Residents	755	1251	5023	5300	0.15	0.24	65.7%	5.5%

*The average and median income figures are for all residents, not just non-Indians.
Sources: 1990 and 2000 Census

In general these data show substantial improvement in the economic conditions faced by all residents but especially by Native American residents over the last ten years. Some of those improvements are listed below:

- After adjusting for inflation, per capita income grew by almost a third for Native American residents, closing the gap relative to non-Indians modestly from 45 to 39 percent. Median family income grew even faster, by almost 60 percent, closing the income gap from 31 to 9 percent.

- The poverty rate for Native American households declined from 40 to 29 percent. Instead of the rate being over three times that for non-Indians, it declined to about twice the rate for non-Indians.
- Educational attainment of Native American residents improved by about 10 percent for both those with some college and for college graduates. Non-Indians with bachelor and advanced degrees, however, surged ahead of Native American residents.
- Employment for Native American residents doubled and those working 35 hours or more a week increased by almost 75 percent. As a result, instead of Native American residents representing about an eleventh of the workers on the Reservation, they now represent about a sixth of all workers.
- The Native American population grew by two-thirds while the non-Indian population grew by only about 5 percent. As a result, Native American residents went from being about one in eight of Reservation residents to being about one in five.

Chapter Six:

Implementation, Monitoring and Amendment Process

Implementation and Monitoring

Many different Tribal Departments, Programs and Committees will be working to achieve the 100–Year Desired Future Conditions and 20–Year Goals contained in the IRMP. The implementation and monitoring plan below includes which Tribal program and/or department is responsible for implementing and monitoring each goal contained in the IRMP. An annual progress report on implementation and monitoring of the Plan will be collated by the Environmental Programs Office in the Natural Resource Department and delivered by the Natural Resource Director to the Tribal Council. This report will consist of information from each program or department that is responsible for goal implementation and will be as quantitative as possible. It will be the responsibility of each Tribal program and department to be aware of the goals in the IRMP and to monitor specific resource or development activities for consistency with the IRMP. Refer to Chapter 7 for an outline of a conceptual decision-making process for decisions that may affect natural, environmental or Tribal cultural resources (all ground-disturbing activities or plans that will lead to ground disturbance).

Amendment Process

The Integrated Resource Management Plan will guide management of Tribal natural, environmental and Tribal cultural resources for the next 20 years. However, there may be a need to make small or large changes to the Plan prior to its revision in 20 years. Amendments may be made at any time by the Coeur d’Alene Tribal Council. If the proposed amendments are sufficiently large enough to change the overall direction of the Tribe's management or if the issue is controversial, then the Environmental Programs Office in the Natural Resource Department may propose holding one or more public meetings to obtain input from Tribal members and other interested public. The Tribal Council will approve holding public meetings as appropriate or as mandated by applicable law.

Implementation and Monitoring for 100-Year Desired Future Conditions and 20-Year Goals

Resource Category: Landscape

Desired Future Conditions or Goals:

- Increase Tribal involvement on all land use changes and development projects in the aboriginal territory and on the Reservation.
- Increase tribal staffing to consult on proposed developments throughout the aboriginal territory and on the Reservation.
- Work with other entitles to establish biodiversity corridors through already developed areas that are linked with adjacent natural areas.

Indicators of Whether Goal was Met:

- Habitat loss,
- Fragmentation, and
- Native species decline.

Lead Departments and/or Programs:

Natural Resource Department, Public Works Department, Lake Management Department and Culture Department.

Resource Category: Culture

Desired Future Conditions or Goals:

- Preserve, protect, manage and enhance Tribal culture.

- Aggressively work with private, local, and federal entities to protect and manage traditional cultural resources and sites.
  Increase awareness regarding the significance of these resources.
- Provide for education of traditional practices and Tribal history to non-native people.
- Protect sacred and culturally significant sites and properties through the *hndesnet* Tribal Culture Department.
- Build a Tribal Interpretive Center.

Indicators of Whether Goal was Met:

- The alteration of resource conditions related to the Tribe's traditional subsistence activities, cultural practices and beliefs.
- Changes in land use, expansion of development, and loss of structure or place.
- Compliance with the National Historic Preservation Act.

Lead Departments and/or Programs:

hndesnet Culture Department, Culture Committee, Natural Resource Department, Public Works Department and Lake Management Department.

Natural Environment

Resource Category: Air

Desired Future Conditions or Goals:

- Work to improve air quality to protect human health and ecology.
- Continue to address point sources of air pollution.
- Reassess guidelines for air pollutants on a continuing basis.
- Continue to collect/monitor air quality and meteorological (weather) data on Reservation and have it available for public awareness.
- Continue working relationships with federal, state and local entities to expand resource directories for pollution sources.
- Increase education/outreach and mitigation for indoor air quality health concerns.
- At a minimum, maintain air quality at U.S. EPA status of Class II Airshed (good air quality but not pristine).

Indicators of Whether Goal was Met:

- Compliance with the Clean Air Act.

Lead Departments and/or Programs:

Natural Resource Department: Air Quality Program.

Resource Category: Biodiversity

Desired Future Conditions or Goals:

- Develop and implement management plans to control non-native species of plants, fish and wildlife by the year 2015.
- Develop and implement management plans to control noxious weeds by the year 2014.
- Continue to offer outreach programs for area residents and youth to share information about biodiversity.
- Involve Tribal elders in passing on knowledge of natural resources.
- Initiate an educational curriculum for area schools to raise student awareness of ecological processes, environmental potentials and plant and animal diversity.
- Coordinate with the local, state, federal, and private entities for the restoration and maintenance of species and habitats.
- Encourage community involvement in caring for the natural biodiversity on the Reservation.

Indicators of Whether Goal was Met:

- Loss of habitat,
- Habitat fragmentation, and
- Migration corridor loss of connectivity from forestry, recreation, agriculture, human population growth, roads and other human impacts.

Lead Departments and/or Programs:

Natural Resource Department, particularly Fisheries and Wildlife Programs, Lake Management Department, with assistance from the IT Department's Geographic Information Systems Program.

Resource Category: Coeur d’Alene Lake

Desired Future Conditions or Goals:

- Coordinate the development of a shoreline management plan.
- Continue to implement and enforce the Tribe’s encroachment program.
- Monitor Lake conditions on an ongoing basis.
- Create more opportunities for Tribal members to conduct subsistence activities in Coeur d’Alene Lake.
- Manage commercial and recreational activities on Coeur d’Alene Lake.
- Continue to regulate all proposed encroachments within Tribal waters to provide safe recreational access, maintain shoreline beauty and protect biodiversity.
- Minimize pollution caused by watercraft.
- Promote active management and protection for native fishes in Coeur d’Alene Lake.
- Implement programs to reduce non-point source and nutrient pollution in Coeur d’Alene Lake to improve and maintain water quality

Indicators of Whether Goal was Met:

- Changes in quality of habitat for native species,
- Changes in water quality parameters,
- Number of encroachments on Tribal waters,
- Trends in recreational use of the Lake, and
- Ability to conduct traditional cultural and subsistence activities on the Lake.

Lead Departments and/or Programs:

Lake Management Department (with assistance from other Tribal departments and programs as desired).

Resource Category: Fire

Desired Future Conditions or Goals:

- Use fire for ecological restoration activities.
- Work cooperatively to protect all structures on the Reservation from fire damage.

- Develop fuel breaks in wildland urban interface and wildland areas to protect resource values and lives.
- Develop a multi-year fire plan for prescribed burns and let burn activities for ecosystem maintenance, thereby reducing risks to wildland urban interface areas. Draft the plan in coordination with other Tribal resource managers and with other entities' fire plans.
- As areas are restored to pre-settlement fire regimes, fire will be used to maintain these conditions.

Indicators of Whether Goal was Met:

- Changes or loss of habitat from fire and fire suppression,
- Changes in agricultural lands from continued burning,
- No large acreage wildfires and no structures lost due to wildfire, and
- Increased percentage of lands classified as Fire Condition Class I.

Lead Departments and/or Programs:

Natural Resource Department's Forestry/Fire/Fuels Program.

Resource Category: Fish

Desired Future Conditions or Goals:

- Protect, restore, and enhance existing terrestrial and aquatic fisheries habitat resources to meet increased demands (i.e. traditional cultural, subsistence, and recreational) on these resources.
- Restore bull trout populations to a level where adult escapement is well distributed, and at least six of the St. Joe River spawning tributaries support healthy spawning populations at any one time, and spawning is occurring in the Coeur d'Alene River portion of the basin. Harvest 1,000 fish annually from the Coeur d'Alene subbasin by the year 2020.
- Protect and restore remaining stocks of genetically pure westslope cutthroat trout to ensure their continued existence in the basin. Maintain catch rates of over 1.0 fish per hour in the St. Joe, Coeur d'Alene and St. Maries Rivers. Produce an annual catch of over 1,000 fish in Coeur d'Alene Lake and an annual catch of 11,000 fish from Lake, Benewah, Evans and Alder Creeks. Achieve good fish population distribution throughout the tributaries to the basin.
- Protect and enhance any remaining stocks of Redband trout or other salmonids present in the Hangman watershed. Specifically, achieve

good spawning populations in Mission Creek, Sheep Creek, Nehchen Creek and Indian Creek. Achieve good rearing habitat in the mainstem of Hangman Creek to allow migration of trout from the Spokane River.

- Provide both short and long-term harvest opportunities that support Tribal subsistence activities and a sport-angler harvest. Maintain fisheries for introduced species to include an annual harvest of greater than 500,000 kokanee, greater than 5,000 chinook salmon, greater than 10,000 rainbow trout in Tribal catchout ponds, and an average catch rate of greater than 0.5 fish per hour for largemouth bass.
- Implement Tribal Fisheries Management Plans to achieve 20–Year goals and 100–Year DFCs.
- Restore, protect, expand and reestablish fish populations in select areas to sustainable levels to provide harvest opportunities.
- Encourage community involvement in caring for native fish populations and habitats.
- Develop cooperative agreements, design habitat restoration projects and pursue funding to accomplish fisheries goals.

Indicators of Whether Goal was Met:

- Loss of naturally producing populations of native fish.
- Change (increase or decrease) in abundance and distribution of native fish.
- Watershed road density.
- Riparian road index.
- Percent altered riparian vegetation.
- Equivalent clearcut area.

Lead Departments and/or Programs:

Natural Resource Department, Fisheries Program.

Resource Category: Forest

Desired Future Conditions or Goals:

- Manage for the long-term health of forests by continuing to implement the Tribal Forest Management Plan on Tribal and allotted lands in order to develop, maintain and enhance forest land in a perpetually productive state utilizing the principles of sustained yield.

- Maintain areas designated for a single or multi-story well stocked forest, providing goods and resources to the community without seriously conflicting with other natural resource elements. Enhance multiple use goals and practices on allotments and Tribal trust lands.
- Encourage forest restoration in identified areas where forested lands have been converted to agricultural areas.
- Encourage private landowners on the Reservation to coordinate their forest practices with Tribal forest management to provide consistent management.
- Maintain the Continuous Forest Inventory (CFI) system in order to provide growth and mortality information.

Indicators of Whether Goal was Met:

- Forest diversity in terms of structure, density and distribution.
- Loss of old growth and age class distribution of the forested areas.
- Sustainable yield in forested areas.
- Forest growth greater than mortality.

Lead Departments and/or Programs:

Natural Resource Department, Forestry/Fire Program.

Resource Category: Minerals

Desired Future Conditions or Goals:

- Formulate an interdisciplinary team and implement a program to review all proposed mining activities and assess potential impacts based on submitted work plans by the year 2014.
- Develop a GIS database to track locations of all mining activities, including rock quarries and material sites.
- Review the federal mining code, research developing a Tribal Mining Code and, if warranted, write a Tribal Mining Code.
- Develop up to three additional Tribal aggregate mining sites (less than 5 acres each) when not in conflict with ecologically and culturally sensitive areas.
- Any mining conducted on the Reservation should be done in a manner which does not negatively affect surrounding lands, waters, biotic or cultural resources.

Indicators of Whether Goal was Met:
- Number of new mining sites (aggregate) on the Reservation.

Lead Departments and/or Programs:
Natural Resource Department, Forestry/Fire Program.

Resource Category: Riparian Areas

Desired Future Conditions or Goals:
- Inventory current riparian conditions in key watersheds to identify areas that are in need of restoration and to identify areas that currently function properly and need protection by the year 2014 (key watersheds are Evans, Alder, Benewah, Lake and Hangman).
- Prepare and implement general and specific restoration plans in key watersheds.
- Develop a cost efficient means of replanting native vegetation and to stabilize streams in key watersheds.
- Acquire riparian habitat for maintenance and/or restoration in key watersheds.
- Work with landowners and agencies to provide cost share and incentives for riparian protection and restoration.
- Protect, restore and enhance riparian areas.
- Encourage use of Tribal recommendations for minimum buffers on all Reservation streams (Appendix D).
- Encourage community involvement in caring for riparian resources.

Indicators of Whether Goal was Met:
- Loss of riparian habitats and shoreline areas.

Lead Departments and/or Programs:
Natural Resource Department, particularly the Fisheries and Wildlife Programs, and Lake Management Department.

Resource Category: Soil

Desired Future Conditions or Goals:
- Reestablish trees or permanent cover on acreage with marginal soil classes.

- Encourage more minimum till and/or no-till farming techniques.
- Improve soil fertility through the use and monitoring of Best Management Practices (BMPs).
- Improve soil permeability through the use and monitoring of BMPs.

Indicators of Whether Goal was Met:

- Erosion potential and rates.
- Loss of chemical fertility, organic matter, and microorganisms.

Lead Departments and/or Programs:

Natural Resource Department, Land Services, Fisheries, Wildlife, Forestry Programs, and Lake Management Department.

Resource Category: Water

Desired Future Conditions or Goals:

- Expand the Tribal Water Resource Program to bring Reservation streams and lakes into compliance with the Tribe's Water Quality Standards by the year 2024. Protect these streams and lakes from anthropogenic (human-caused) pollution.
- Coordinate with other entities and the public to restore Reservation water bodies to Tribal water quality standards.
- Coordinate with other entities and the public to bring the 303(d)-listed water bodies into compliance with water quality standards through the implementation of Total Maximum Daily Loads (TMDLs) and Tribal water quality standards.
- Encourage implementation of water quality-based BMPs on all Reservation streams.

Indicators of Whether Goal was Met:

- Impacts on water quality and quantity from agricultural practices, transportation systems, forestry practices, water systems, human habitation and other human impacts.

Lead Departments and/or Programs:

Lake Management Department, Water Resources Program.

Resource Category: Wetlands

Desired Future Conditions or Goals:

- Restore proper functioning conditions to a minimum of 30 percent (estimated at 6,425 acres) of the native riparian/wetland habitats to support vertebrate species that use these habitats by the year 2024.
- Coordinate with other entities and the public to restore and maintain wetlands.

Indicators of Whether Goal was Met:

- Loss of wetlands from agriculture, forestry, transportation, grazing, human habitation and other human impacts.

Lead Departments and/or Programs:

Natural Resource Department, Fisheries and Wildlife Programs, and Lake Management Department.

Resource Category: Wildlife

Desired Future Conditions or Goals:

- Reintroduce as many of the native extirpated (locally extinct) wildlife species within the Reservation as possible.
- Control populations of non-native wildlife species within the Reservation, especially those that adversely affect native populations.
- Establish and implement annual population monitoring of culturally important species.
- Establish designated travel corridors that provide refuge for wildlife species.
- Quantify the effects of predators on game species, particularly big game.
- Establish a process of monitoring calving success on all big game species.
- Designate summer and winter range for big game on the Reservation and manage fires and forest harvest to maximize forage availability on summer ranges.
- Adjust road closures as necessary to ensure protection of wildlife populations during critical periods.
- Protect and restore a minimum of 1000 acres of Palouse Steppe.

- Designate 1000 acres of moist coniferous forest for development of old growth conditions.
- Designate 2500 acres of low elevation dry forest habitat for development of old growth open woodland conditions.
- Coordinate with other entities and the public to restore and maintain wildlife habitats and species across the Reservation, including Threatened and Endangered Species (TES).
- Provide short and long term harvest opportunities that support both subsistence activities and limited sport harvest.
- Continue to pursue and acquire funding to protect and/or restore key pieces of wildlife habitat such as wetlands, riparian areas and big game winter range.
- Encourage community involvement in caring for wildlife populations and habitats on the Reservation.

Indicators of Whether Goal was Met:

- Impacts on native wildlife species and native wildlife species' habitat from agricultural practices, forestry practices, transportation systems, recreation practices, and human habitation.

Lead Departments and/or Programs:

Natural Resource Department, Wildlife Program.

Resource Category: Threatened & Endangered Species

Desired Future Conditions or Goals:

This is only a separate resource category in Chapter 5 and therefore has an indicator but no specific DFCs or goals.

Indicators of Whether Goal was Met:

- Loss of species or species habitat.

Lead Departments and/or Programs:

Natural Resource Department, Fisheries and Wildlife Programs.

Human Environment

Resource Category: Agriculture

Desired Future Conditions or Goals:

- Retain existing farmland for future generations, restore marginal farmlands to forest lands. Continue to grow wheat, barley, lentils, peas and grass seed.
- Reduce agricultural-related erosion by 25 percent by the year 2024.
- Reduce the application of chemicals by 50 percent on agricultural lands by the year 2024.
- Evaluate Tribal agricultural lands for productivity and determine the suitability of other resource values by the year 2014.
- Work with other entities and the public to evaluate private, non-Trust agricultural lands for productivity and to develop management recommendations.
- Reduce soil erosion through implementation of agricultural Best Management Practices (BMPs).
- Encourage planting of perennial crops and utilizing no-till farming practices to reduce soil erosion.
- Continue to research alternatives to agricultural field burning.
- If feasible alternatives to agricultural field burning are developed, then implement them to reduce emissions.
- Develop a botanical garden and a youth garden.

Indicators of Whether Goal was Met:

- Changes in acreage of agricultural lands within the Reservation.

Lead Departments and/or Programs:

Natural Resource Department, Land Services, Wildlife, Fisheries and Forestry Programs, and Lake Management Department.

Resource Category: Development

Desired Future Conditions or Goals:

- Encourage well thought out development projects in designated areas through sound planning.

- Develop visually pleasing buildings that are complimentary to the natural and cultural setting in environmentally suited areas.
- Provide for a Tribal culturally specific built environment.
- Coordinate land use and development patterns (planning and implementation) between the Tribe, other entities and the public.

Indicators of Whether Goal was Met:

- Loss of natural environment to development.

Lead Departments and/or Programs:

Public Works Department (with assistance from other Tribal departments and programs such as the Housing Authority).

Resource Category: Energy

Desired Future Conditions or Goals:

- Research, develop, and promote the use of alternative energy and fuel sources such as wind, solar, hydrogen, and others.
- Promote the research and use of alternative technology to conserve energy and other resources.
- Regulate the use and transport of nuclear materials on or through the Reservation consistent with federal law.

Indicators of Whether Goal was Met:

- Number of acres in use for alternative energy transmission or development.

Lead Departments and/or Programs:

Public Works Department (with assistance from other Tribal departments and programs).

Resource Category: Environmental Health

Desired Future Conditions or Goals:

- Assist in the proper design, construction and operation of schools, day cares, private water and septic systems, food service facilities and community buildings for optimal public health and safety.

- Strengthen the collaboration between Tribal Environmental Health, Benewah Medical Center and the State of Idaho’s Panhandle Health District.
- Work to eliminate the installation and operation of sub-standard water and sewer systems.
- Eliminate vector-borne illnesses on the Reservation through the use of integrated programs for pest control, habitat management, and public education.
- Develop programs to deal with chemical and physical hazards, including hazardous chemical spills, household hazardous chemicals, and preventable injuries.
- Assist in the process to design, construct, and operate public water recreation facilities (including swimming pools, spas, waterslides, spray pools, and bathing beaches) to meet or exceed all applicable standards for sanitation and safety. Reduce or eliminate waterborne illnesses associated with these types of facilities.
- Clearly define and expand the role of the Tribal Environmental Health Program.
- Collect data on potential contaminants and, if found, eliminate or mitigate.
- Continue State/Tribal cooperation with Idaho State inspections.
- Develop Tribal primacy where desirable and feasible.

Indicators of Whether Goal was Met:

- Continuation and expansion of the Tribal Environmental Health Program.
- Improvement in Reservation morbidity and mortality statistics affected by on-going environmental health programs.
- Sustained improvement in mean inspection scores for all types of facilities undergoing routine environmental health and safety inspections.
- Development of baseline statistical data for all environmental health core program areas. Reduction in preventable injuries attributable to chemical and/or physical hazards. Improvement in chemical and bacteriological water quality for individual water systems.
- Clean up of existing open dumpsites and monitoring of potentially hazardous abandoned landfill sites.
- Increased public/environmental health awareness resulting from health education and community outreach activities.

Lead Departments and/or Programs:
Natural Resource Department, Environmental Programs Office.

Resource Category: Housing

Desired Future Conditions or Goals:

- Work with other entities and the public to establish habitat corridors and provide open space.
- Protect fish and wildlife habitat during construction using BMPs.
- Implement the Tribal Housing Authority Indian Housing Plan.
- Coordinate with other entities and the public to incorporate conservation subdivision designs into housing developments.
- Work with other entities and the public to create consistency between Tribal and non-Tribal housing plans, especially for the location and density of new housing.

Indicators of Whether Goal was Met:
The number, type and location of new houses and subdivisions.

Lead Departments and/or Programs:
Tribal Housing Authority (with assistance from other Tribal programs and departments as desired).

Resource Category: Infrastructure

Desired Future Conditions or Goals:

- Ensure that the transportation, power and telecommunications infrastructure supports the Tribal Government, public safety personnel (fire/medical/police), medical facilities, educational institutes, planned new development, Reservation communities, access to farm and market roads and amenities suitable for a rural population.
- Continue to provide universal broadband services that are capable of integrating voice, data, and video, as well as other emerging technologies.
- Prepare a power and telecommunications master plan and incorporate it into the Tribal Comprehensive Plan, and Tribal Code.

- Work with Tribal and non-Tribal governments and the public to develop a coordinated transportation management plan for the Reservation.
- Continue to update and implement the Tribe's transportation plan.
- Coordinate a water/sewer management plan with counties and cities within the Reservation.

Indicators of Whether Goal was Met:

- Number of acres used for infrastructure.

Lead Departments and/or Programs:

Public Works and Information Technology Departments (with assistance from other Tribal departments and programs as desired).

Resource Category: Pesticides

Desired Future Conditions or Goals:

- Continue to maintain, enforce and update the Coeur d'Alene Tribal Code and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) on Circuit Rider Cooperating Reservations.
- Continue compliance use inspections and follow-up inspections.
- Continue to communicate with nationwide Tribal pesticide enforcement programs through existing networks such as Tribal Pesticide Program Council (TPPC) and the Institute for Tribal Environmental Professionals (ITEP).
- Build/enhance relationships with the regulated community regarding Tribal pesticide enforcement activities on the Reservation.
- Enhance relationships with the Idaho State pesticide program to improve communication and cooperative investigations.

Indicators of Whether Goal was Met:

- The extent or area of pesticides use.
- The type and effects of pesticides used.

Lead Departments and/or Programs:

Natural Resource Department, Pesticide Circuit Rider Program.

Resource Category: Recreation

Desired Future Conditions or Goals:

- Implement a State/Tribal trail management plan for the Trail of the Coeur d'Alenes.
- Develop and update recreation codes that meet the needs of future Tribal activities.
- Manage the Reservation segment of the "Trail of the Coeur d'Alenes."
- Work closely with the State of Idaho to assure a seamless connection between State and Tribal portions of the Trail of the Coeur d'Alenes.
- Develop a Tribal Recreation Plan.
- Identify and develop additional recreational sites and parks as desired and appropriate.
- Develop a boat launch and campsite.
- Aid in the development of Camp Larson (recreation facility) planning and operations.

Indicators of Whether Goal was Met:

- Changes in acreages and number of developed recreation and water recreation facilities and locations.

Lead Departments and/or Programs:

Lake Management Department, Recreation Program.

Resource Category: Solid/Hazardous Waste

Desired Future Conditions or Goals:

- Properly store, transport, handle, and dispose of hazardous materials on the Reservation.
- Coordinate with other entities and the public to develop a solid waste management plan for the Reservation.
- Promote source reduction, composting, reuse and recycling of solid wastes.

Indicators of Whether Goal was Met:

- Amount of solid waste generated on the Reservation.
- Amount of hazardous materials stored on or transported through the Reservation.

Lead Departments and/or Programs:
Public Works Department and Natural Resource Department, Environmental Programs Office.

Resource Category: Land Use Recommendations

Desired Future Conditions or Goals:

- Restore and maintain Tribal traditional cultural land use for subsistence activities as desired.
- Maintain the rural character of the Reservation in all LMRs except for areas designated for development (as shown in Land Management Recommendation 1).
- Encourage maintenance of existing farmland and forestland.
- Encourage maintenance and restoration of wetlands, riparian areas, streams and forestland.
- Discourage subdivision of property in all LMRs except for areas designated for development (as shown in Land Management Recommendation 1).
- Develop a Land Use Plan for the Reservation, including a Shoreline Management Plan.
- Develop open space plans for Reservation watersheds.
- Utilize principles of conservation zoning to require conservation of open space identified in the plans when property is developed (Arendt 1999).

Indicators of Whether Goal was Met:

- Changes in land use from current land use.

Lead Departments and/or Programs:
Public Works Department (with assistance from other Tribal departments and programs as desired).

Resource Category: Social and Economics

Desired Future Conditions or Goals:

- The Social and Economics category is included only in Chapter 5. This category has criteria to measure expected change due to implementation of the IRMP but the Desired Future Conditions and

Goals that relate to the Social and Economics section are contained in all of the other resource categories listed above. The criteria to measure expected change is as follows (Coeur d'Alene Tribe 2000b and 2007b):

- *Economic & Subsistence:*
  - Moderate improvements in quality of subsistence resources, fairness and equity.
- *Spiritual / Moral:*
  - Moderate improvements in protection of culture, traditions, and religion.
  - Minor restrictions on freedom to make private choices.
- *Aesthetics:*
  - Moderate improvements in natural beauty, open space, and recreation opportunities.
- *Community Well-Being:*
  - Moderate improvements in projection of future generations, cultural diversity, and land integrity.
- *Personal Well-Being:*
  - Minor improvements in income.
  - Maintenance of health and peace of mind.

Indicators of Whether Goal was Met:

- Changes in the five quality of life criteria: Economic and subsistence, Spiritual / moral, Aesthetics, Community well-being, Personal well-being.
- Changes in rural character and quality of life.
- Change in composition of population.
- Change, quality and distribution of employment opportunities.
- Change and distribution of real personal income.

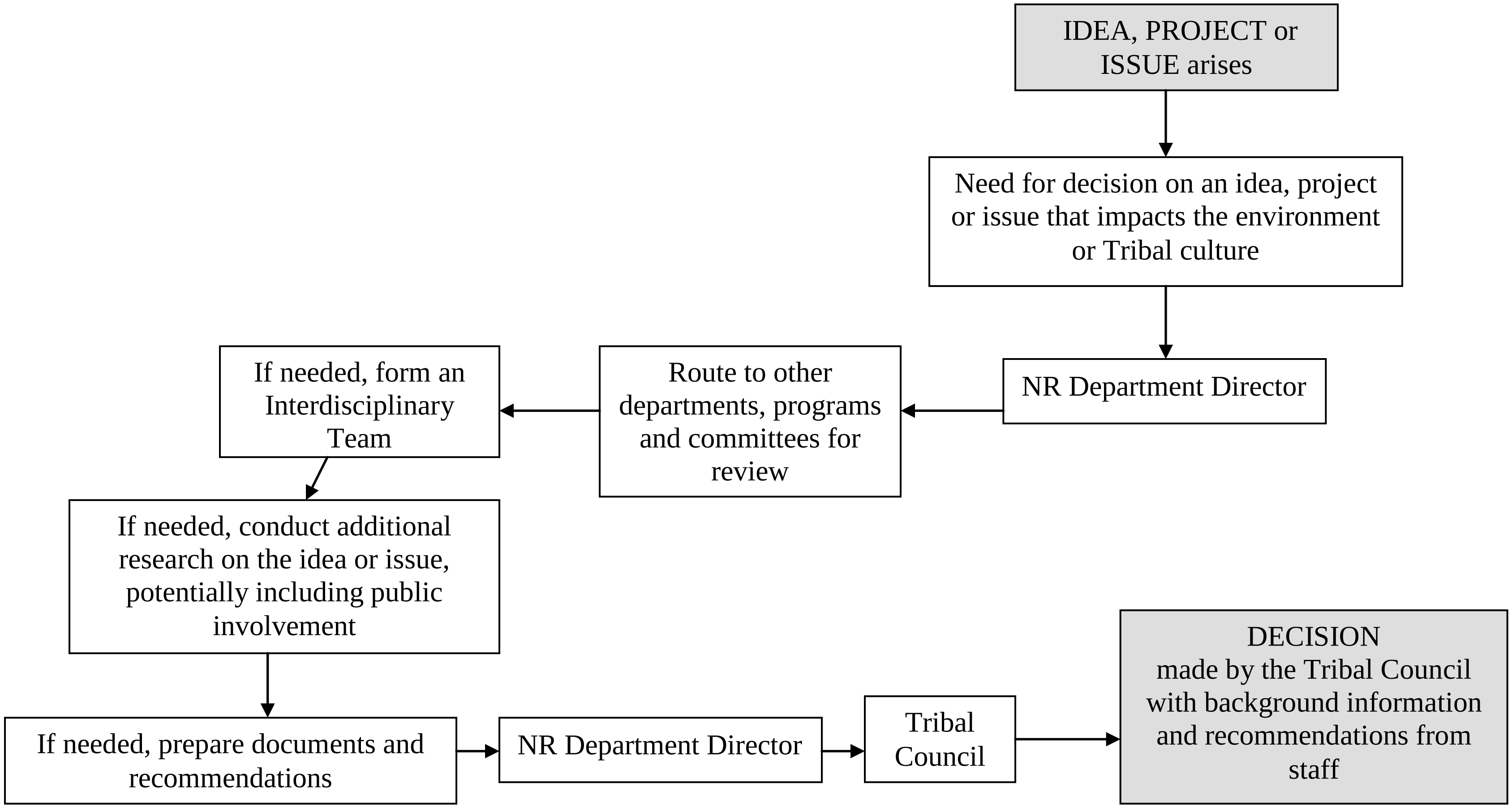
Lead Departments and/or Programs:

Public Works Department.

Chapter 7

Integrated Resource Management Plan Conceptual Decision-Making Process

Integrated Resource Management Plan
Conceptual Decision-Making Process



This flowchart depicts a conceptual consultation and decision route for both Tribal environmental decisions and for decisions that impact the Tribal environment and Tribal culture. The route is designed to allow for consistent environmental impact review and consideration before project plans are finalized for funding or implementation purposes. A more detailed and complete process may be developed in the future.

Appendix A

History of the Coeur d'Alene Tribe

From Time Immemorial to 1873: 5 million acres of Tribal Territory

The Coeur d'Alene Tribe's aboriginal lands included about 5 million acres, but, as with all Indian tribes, the Coeur d'Alenes ceded large areas of their territory and, through various agreements, reserved a portion of it (the "Reservation") for their exclusive use and occupancy.

The Coeur d'Alene Tribe was to have negotiated a treaty with Washington Territorial Governor Isaac Stevens, who had been assigned the job of treaty-making with western Indian nations. In the 1850's more westerly tribes signed treaties negotiated by Stevens, but this treaty-making process did not go as far east as Coeur d'Alene Territory before the outbreak of the Civil War. During that conflict, treaty-making with tribes was put on hold, but white settlement of Tribal territories continued. Gold was discovered in Coeur d'Alene territory in 1860, bringing in a flood of fortune-seekers. In 1867, President Andrew Johnson attempted to open up the Tribe's area for settlement by drawing up orders to establish a 250,000 acre reservation for the Tribe. The Coeur d'Alene Tribe was not even informed of this until 1871, when they rejected the offer because the land base was too small and did not include Coeur d'Alene Lake within the boundaries of the Reservation.

1873: loss of several million acres

In 1872 Congress officially ended treaty-making with Indian Tribes, and the Coeur d'Alene's first reservation was established by an executive order of President Ulysses S. Grant in 1873. The reservation described in Grant's order included all of Coeur d'Alene Lake except a part of the north shoreline. The surveyed area of this reservation was nearly 600,000 acres.

Contingent upon the Government's fulfillment of the terms of the 1873 Agreement and Executive Order, the Tribe agreed to relinquish claim to more than 4 million acres of its territories, and permitted the government to maintain roads through the reservation. However, the Tribe expressly retained its right, title and interests in the beds and banks of waters within the 1873 Reservation, and insisted upon express assurance all waters entering the 1873 Reservation shall not be turned from their natural channel. In exchange, the Government was to provide the Tribe with, inter alia, a school, a blacksmith shop, a mill, farm implements, and a payment of $170,000 for its 4 million acres. But Congress did not ratify this agreement, leaving the status of government title in these lands unresolved until Congress ratified the 1887 and 1889 bi-lateral agreements between the federal government and the Tribe.

1891: loss of 200,000 acres

In 1887, the Tribe reached another agreement with the federal government, which reaffirmed the Tribe's right to the exclusive occupancy of the reservation described in President Grant's 1873 order. Again, the agreement was not ratified, leaving government title in lands outside the Reservation unresolved until the 1887 and 1889 Agreements were ratified by Congress in 1891.

In 1889 government negotiators and the Tribe reached another agreement which would cede the northern part of the reservation described in Grant's executive order, about 185,000 acres. The 1889 and 1887 Agreements were ratified by Congress in 1891.

1894: loss of 3,000 acres

In 1894 a one-mile wide strip of the reservation, known as the "Harrison Cession," was sold to the federal government.

1906-1922: Tribal land takings through the Allotment Process

The Dawes Act is probably the single greatest blow to Tribal land ownership, natural resource ownership, and self-sufficiency, and resulted in the loss of 90 million acres of Tribally-held lands nationwide. Not only were enormous tracts placed in non-Indian ownership, the way in which the lands were allotted was unfair and arbitrary and often the best farmland was saved for homesteaders. Tribal members were forced away from their territorial waters in the process.

Old Moctelme house (photo from the Father Connelly collection).

The big, successful Reservation farms of Coeur d'Alene families were broken up and made available to homesteaders. Tribal members essentially got what was left over, although the process was supposed to work the other way around.

Tribal members who had lived along Coeur d'Alene Lake since time immemorial were refused allotments along the lake by the Indian alloting agent, Wiliam B. Sams, even though his instructions from the Department of Interior directed that Tribal members could select allotments anywhere on the Reservation. As a result, Tribal members lost productive marsh lands along the St. Joe River, their traditional lakeside camps and homes, and they were relegated to the farthest edge of the Reservation on 160 acre allotments.

1908-1911: Other Tribal land takings by the federal and state governments

The Tribe's land holdings were reduced in 1908 with a grant, by Congress, of 40 acres for the St. Maries Cemetery. Again in 1908, Congress approved the withdrawal of nearly 7,000 upland acres to establish Heyburn Park. This was supposed to be set aside for a national park, but the park land was deeded by the Congress to the State of Idaho in 1911 for about $11,000. This amount was spent on so-called "administrative costs" instead of being deposited in trust, as required, for the benefit of the Tribe. The United States' grant is contingent upon the State of Idaho maintaining the area consistent with park-like purposes, upon violation of which the area would revert to the United States on behalf of the Tribe.

In 1909 Congress granted 160 acres of the Reservation for the use by the University of Idaho.

The big picture from contact to 1922: Impoverishment of Indians through loss of Tribal resources: Enrichment of non-Indians through their taking and exploitation of those resources.

For thousands of years before European contact, the Coeur d'Alene Tribe had 5 million acres of territory to sustain its people, its culture, and its future.

The period between the late 1800's and the 1920's was a "boom" time for the non-Indian economies. Mining and logging on our aboriginal lands made many non-Indians millionaires many times over, and ultimately caused enormous damage to the environment. It is difficult to imagine now the kind of frantic extraction of silver and other valuable minerals and full-speed clear cutting of vast tracts of forestland that occurred during this period, but it happened at a time when people could not conceive of a limit, an end, to the natural resources on the continent. Now, of course, we know better, and it is one of the Coeur d'Alene Tribe's most important efforts to restore and clean up the natural world which was so depleted and damaged by the uncontrolled exploitation of the once abundant natural resources.

1922-1953: Life improves (a little bit and very slowly) for Tribes

In 1924, as the Allotment period was ending, Congress enacted a law giving citizenship to Indians born in the United States. Tribal members with allotments had been granted citizenship through the Allotment Act, and the 1924 act was intended to make sure that all Indians, whether allottees or not, would have the benefits and privileges of U.S. citizenship. Tribal members have dual citizenship, in their Tribes and as U.S. citizens. In 1928, the "Merriam Report" about the conditions of life on Indian reservations was published and gained nationwide attention. This report described in detail the dismal failure of federal Indian policy during the Allotment period, and the general failure of the Bureau of Indian Affairs to live up to the promises the federal government made to Tribes. It reported on the lack of health care, of education, of basic services, of food and shelter, on impoverished Indian reservations where the BIA reigned supreme. All this after having given up millions and millions of acres of land and priceless resources, on promises that were never kept.

In 1934, the public outcry about the terrible living conditions of Indian people described in the Merriam Report led the government to pass the Indian Reorganization Act. This law was intended to protect the remaining land base of tribes by ending allotment and providing tribes a "blueprint" for setting up governments and legal structures. The law authorized tribes to organize and adopt constitutions and by-laws, and all but 88 Tribes in the country agreed to do this. The IRA was far from perfect, but it did halt the loss of Tribal ownership of lands and provided a framework for Tribes to re-establish governments; governments based on a non-Indian model, of course, but at least Tribes now could put in place internal organizations which could function in the context of the non-Indian world.

DeSmet second school, 1882 (photo from the Father Connelly collection).

The Coeur d'Alene Tribe adopted its constitution in 1947 and ever since has functioned under a governmental system which is responsible for the health, welfare and safety of the Tribe and for the protection of Tribal assets. We take our responsibilities very seriously and are continually working to improve the government of our Tribe.

1953-1968: A detour into bad times: Termination, Relocation and Public Law 280.

In the early 1950's, the federal government's position regarding Indian Tribes took a terrible turn, and in 1953 the Congress adopted a Termination Policy, essentially to get rid of Indians as a distinct political group. The Termination Era was tragic for Tribes who were either forced to terminate by law or who agreed to terminate based upon promises of quick cash for their lands.

At the same time, the BIA was trying to get Indians to leave reservations under its "relocation" program. The BIA offered grants to Indians to move to cities and seek work there. The relocation program was for the most part a failure which did not provide lasting employment for relocated Tribal members, but sent them to cities without the necessary training and support they needed to succeed. What it "accomplished," if the Indians stayed, was to increase the number of urban poor who suffered the added trauma of dislocation. Many Coeur d'Alene Tribal families were relocated to big cities such as Chicago, Los Angeles, and Denver, but many of them returned after short and unhappy stays. The Tribal members who did not return joined the ranks of "urban Indians" who have been unable to maintain close connections with Tribal history and culture. Relocation did little to help Indians, and much to hurt Tribes.

In 1953 Congress also passed Public Law 280, which extended state civil and criminal jurisdiction in five states and provided that other states could take such jurisdiction by statute or constitutional amendment. Consent of affected Tribes was not required, and several states, including Idaho, took partial jurisdiction over certain crimes under this authority. But, because the cost of asserting this jurisdiction was often more than states wanted to pay, the result simply was a neglect of law enforcement in Indian Country by Public Law 280 states. Once again, conditions which would cause a public outcry in communities outside the reservation were allowed to persist on the reservation because Indians had little or no political clout with federal and state governments that were indifferent or even hostile to our concerns.

1968-Present: Self Determination and Strides by Tribes

The termination and relocation policies of the 1950's and 1960's were recognized as failures by the late 1960's, and in 1968, Congress passed the Indian Civil Rights Act (ICRA) which provided that most of the civil rights (free speech, free exercise of religion, due process and equal protection), extended to Indian people and Tribal governments, which were required to respect those protections. In a back handed sort of way, the federal government was recognizing that tribal governments were here to stay, and tribal members must be protected from government excesses in the same way that US citizens are protected from their government in the Bill of Rights: the ICRA said the Tribal governments must respect the civil rights of Tribal members.

The most important federal policy shift in favor of Tribal sovereignty, however, came in 1970 with President Richard Nixon's declaration that Tribes should be self-determining governmental entities, and that federal laws and regulations should be enacted to give those governments a maximum degree of authority and autonomy. The Indian Self-Determination and Education Assistance Act, P.L. 93-638 ("638") was passed in 1974 and gave Tribes the authority to enter into contracts to provide important services previously provided directly under the BIA and other federal agencies. The Coeur d'Alene Tribe has entered into many "638" contracts and oversees its own health care, law enforcement, education, natural resources, and other programs.

In 1987, the U.S. Supreme Court case of Cabazon Band vs. California, which recognized the sovereign right of tribes to engage in gaming without the interference of state regulation, set the stage for much of the economic development on Indian reservations, which we are now seeing today. Although in 1988 the federal Indian Gaming Regulatory Act required Tribes to enter into gaming compacts with states, many Tribes, including the Coeur d'Alene, reached agreement on gaming and have embarked on a new era of economic enterprise and self-sufficiency. The Coeur d'Alene Tribe opened its casino as a small operation in 1993. The gaming operation has been successful and provides money for Tribal government, schools, libraries and museums on and near the Reservation, and helps us diversify our economy with other business enterprises. Since 1994, the Tribe has given nearly $5 million of its gaming profits to schools, libraries, museums, and other worthy educational causes. The Tribe is a major employer in both Benewah and Kootenai counties, providing, directly and indirectly, thousands of jobs for Indians and non-Indians. The Tribe benefits all of the community through the operation of the only full-service grocery store in Plummer, the only health-care clinic in town, the only Senior Center, and the only Wellness Center. The Tribe has helped industries such as Stimson Lumber Company (formerly Plummer Forest Products) open and provides jobs in the timber industry. The Tribe, through the construction and operation of a beautiful golf course and expanded hotel is pursuing a goal of making this area a destination resort and recreation hub. Through the diversification of its economic base the Tribe has the goal of bringing of more jobs and revenue to this region.

In 1998, the Tribe's retained ownership of the beds and banks of navigable waters within the Reservation was affirmed by the U.S. District Court for the District of Idaho, United States v. Idaho, 95 F. Supp.2d 1094 (D. Idaho 1998), aff'd 210 F.3d 1067 (9th Cir. 2000), aff'd sub nom., 121 S.Ct. 2135 (2001)("Tribal waters"). The Tribe's remaining claims to ownership of those waters riparian to Heyburn State Park and the northern two-thirds of the lake were not resolved by this litigation. The Tribe now manages and protects these Tribal waters for the benefit of present and future generations.

Conclusion:

The Coeur d'Alene Tribe is increasing the number of jobs available here and supporting education of all children in the area. The Tribe is a good neighbor in this region. Despite the enormous losses the Tribe has suffered, despite the neglect of the federal government and its breaches of trust responsibility, we are making progress. The success of the Coeur d'Alene Tribe, in economic development, education and the restoration of the environment and maintenance of the natural resources on the Reservation, will benefit the entire community.

Crystal Lake (photo by John Hartman).

Appendix B

Summary of EAP Assessment Risk Rankings

Summary of Risk Rankings Completed by the EAP Steering Committee and Approved by the Coeur d'Alene Tribal Council

Please note that, for the most part, the risk rankings are based upon conditions on and near the Coeur d'Alene Reservation and are not a comparison between the Reservation and other areas in the United States or the world. Also note that concern number 22 Native Wildlife and Fisheries Habitat has been broken into 22A Native Wildlife Habitat and 22B Native Fisheries Habitat because the Steering Committee thinks that wildlife habitat is at a medium risk while fisheries habitat is at an extreme risk.

Table B.1

	Environmental Concerns	*EAP Steering Committee Rankings*
Land		
1.	Agricultural chemicals	8 MEDIUM/3 HIGH
2.	Energy production and consumption	MEDIUM
3.	Food contamination	MEDIUM
4.	Tribal cultural food and medicines contamination	EXTREME
5.	Forest health	HIGH
6.	Hazardous waste	MEDIUM
7.	Human population growth and development patterns	EXTREME
8.	Roads	HIGH
9.	Solid waste generation and disposal	MEDIUM
Air		
10.	Indoor air pollution	MEDIUM
11.	Outdoor air pollution	MEDIUM
12.	Localized effects of atmospheric changes	LOW

13.	Localized effects of Hanford Nuclear Reservation	HIGH

Water

14.	Drinking water quality and contamination	HIGH
15.	Groundwater contamination	HIGH
16.	Hydrologic changes	HIGH
17.	Non-point source surface water pollution	HIGH
18.	Point source surface water pollution	MEDIUM

Multi-Media

19.	Wetlands	6 MEDIUM/6 EXTREME
20.	Native plant and animal populations and species diversity	HIGH
21.	Tribal culturally-important species' populations and diversity	EXTREME
22A.	Native wildlife habitat	MEDIUM
22B.	Native fisheries habitat	EXTREME
23.	Non-native plant and animal species	HIGH
24.	Soil productivity	HIGH
25.	Tribal cultural sites	EXTREME

Appendix C

Applicable Laws and Minimum Management Requirements

This Appendix describes in greater detail the various Federal and Tribal laws and policies that the Tribe will comply with for ground disturbing projects where applicable.

Consistency with other Plans, Permits, Authorizations, and Approvals

The level of detail in this IRMP is relatively broad in scope. When appropriate, site-specific environmental compliance can be accomplished prior to initiating any major surface disturbing activities. When specific actions are considered, additional environmental evaluations will incorporate by reference the general desired future conditions and goals in this IRMP and concentrate on the issues specific to the site. This approach is known as "tiering." The necessary environmental clearances and permits will be obtained prior to initiating construction activities.

The environmental planning, consultation, and impact assessment processes have been integrated to comply with applicable federal regulations. The applicable laws that would need to be reviewed for consistency or required for environmental clearance for future ground-disturbing projects are summarized below (Table C.1) and detailed further below.

Table C.1 Applicable Laws

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
FEDERAL			
Archaeological Resources Protection Act	Potential impacts to suspected or actual historic, archeological properties	U.S. Department of Interior (DOI) Bureau of Indian Affairs	16 U.S.C. §470aa-11 and 25 C.F.R. Part 262
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	Designation of "Superfund" sites and clean-up	U.S. EPA (Not Applicable)	42 U.S.C. 9601 and 42 U.S.C. 11001
Clean Air Act	Permit needed if there is point source discharge into air	U.S. EPA	42 U.S.C. 7401
Federal Water Pollution Control Act (known as the Clean Water Act)	Section 9/10 and 404 permitting if any navigable water is to be obstructed, altered, or improved. Permitting is also required if discharge, dredge, or fill materials are to be introduced into waters of the US or adjacent wetlands. A permit is also needed to build bridges or causeways in navigable waters	U.S. Army Corps of Engineers	33 U.S.C. 1251

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
Endangered Species Act	Consultation required if waters are proposed to be modified or controlled. Potential impacts to plant or animal species listed as Threatened or Endangered	U.S. Fish and Wildlife Service	16 U.S.C. 1531
Federal Emergency Management Act	Any structure or activity that may adversely affect the flood regime of a stream within the flood zone	U.S. FEMA	42 U.S.C. 4001-4128 and 33 C.F.R. 320.4 (k), 40 C.F.R. 6.302, 44 C.F.R. 59-62, 64-68, 70-71, 75-77
Federal Insecticide, Fungicide and Rodenticide Act	Certification required for use of some pesticides	U.S. EPA	7 U.S.C. 136
Forest and Rangeland Renewable Resources Research Act	Restoration and enhancement of rangelands and forestlands converted into agricultural lands	U.S. Department of Interior	16 U.S.C. 1600 and 16 U.S.C. 1641
Hazardous Materials Transportation Act	Regulate the transportation of all hazardous materials including chemical and nuclear	U.S. Department of Energy	16 U.S.C. 12H (1994 and Supp I 1995)
Indian Agricultural Resource Management Act	Development and manage ment of Indian agricultural lands	U.S. DOI Bureau of Indian Affairs	25 U.S.C. 3701

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
Indian Land Consolidation Act	Consolidation of Indian lands for contiguous Reservations	U.S. DOI Bureau of Indian Affairs	25 U.S.C. § 1701
Indian Mineral Leasing Act	Mining leases on Reservation lands	U.S. DOI Bureau of Indian Affairs	25 U.S.C. 396a-g C.F.R. Part 211
Indian Religious Freedom Act	Rights of Native Americans to practice traditional religions, have access to sites for ceremonial and traditional uses	U.S. DOI Bureau of Indian Affairs	42 U.S.C. 1996 & note
Land Conservation and Restoration Act	Provides for restoration and conservation of natural areas	U.S. Department of Interior	25 U.S.C. 466 [Grazing-25 C.F.R. Part 166]
Migratory Bird Treaty Act of 1918	Prohibits killing of designated migratory birds	U.S. Department of the Interior	16 U.S.C. 703-712
National Environmental Policy Act	Compliance with NEPA	U.S. DOI BIA and Council on Environmental Quality	42 U.S.C. § 4321 40 C.F.R. and 1500
National Forest Management Act	Federal policy on manage ment of federal forest lands	Not Applicable	16 U.S.C. 1600, 1611 to 1614
National Historic Preservation Act	Federal policy on preserving Historic Properties	U.S. Advisory Council on Historic Preservation	16 U.S.C. 470

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
National Pollutant Discharge Elimination System	Any discharge of potential pollutants into State or Tribal water bodies	U.S. EPA	33 U.S.C. 1342
National Indian Forest Resources Management Act	Requires management of Indian forest lands using principles of sustained yield and multiple use	U.S. DOI Bureau of Indian Affairs	25 U.S.C. 3101 and 25 CFR Part 163.11 (Public Law 101-630)
Native American Graves Protection and Repatriation Act	Protection of Native American graves and sites	U.S. DOI Bureau of Indian Affairs	25 U.S.C. 3001
Pacific Northwest Electric Power Planning and Conservation Act (aka Northwest Power Act)	Requires mitigation and enhancement of Columbia River fish and wildlife to offset impacts of hydro electric damage	U.S. Dept. of Energy	Title 49 C.F.R. Parts 100–185
Resource Conservation and Recovery Act	Recovery of wetlands and other ecological features	U.S. EPA	42 U.S.C. 6901
Safe Drinking Water Act	Maintenance of safe drinking water. Limitation on where and what water can be used	U.S. EPA	42 U.S.C. 300f
Soil and Water Resources Conservation Act of 1977	Reduction of sedimentation from land use practices that degrade water quality	U.S. Department of Agriculture	16 U.S.C. 2001

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
Surface Mining and Control Reclamation Act	Reclamation of lands that have been mined	U.S. DOI Bureau of Indian Affairs	30 U.S.C. 1201
Toxic Substances and Control Act	Regulate chemicals that present risk to health and environment	U.S. EPA	15 U.S.C. 2601
TRIBAL			
Boating on Tribal Waters	All vessels on Tribal waters need to be registered with the Tribe	Coeur d'Alene Tribe	Chapter 43 of the Coeur d'Alene Tribal Code
Cultural Resources Protection	Established the Tribe's Cultural Resources Committee	Coeur d'Alene Tribe	Chapter 52 of the Coeur d'Alene Tribal Code
Eminent Domain	Condemnation of property for public purpose	Coeur d'Alene Tribe	Chapter 33 of the Coeur d'Alene Tribal Code
Encroachments	Permit from the Tribe is needed for all encroachments on the Tribal portion of Coeur d'Alene Lake	Coeur d'Alene Tribe	Chapter 44 of the Coeur d'Alene Tribal Code

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
Exclusion	Provides for exclusion of non-Tribal members from the Reservation under rare and extraordinary circumstances	Coeur d'Alene Tribe	Chapter 25 of the Coeur d'Alene Tribal Code
Firewood Cutting	Permit from the Tribe is needed for all firewood cutting on trust lands	Coeur d'Alene Tribe	Coeur d'Alene Tribal Resolution 188(2009)
Land Preservation and Consolidation	Establishes Tribal policy related to lands and waters within the Reservation	Coeur d'Alene Tribe	Chapter 36 of the Coeur d'Alene Tribal Code
Off-Reservation Hunting, Fishing and Trapping	Permit from the Tribe is needed for Tribal members to hunt big game outside of the Reservation in the Tribe's aboriginal territory	Coeur d'Alene Tribe	Chapter 21 of the Coeur d'Alene Tribal Code
On-Reservation Hunting, Fishing & Trapping	Permit from the Tribe is needed to hunt on the Reservation (Tribal members need to have their Tribal Identification only)	Coeur d'Alene Tribe	Chapter 20 of the Coeur d'Alene Tribal Code
Pesticides	Establishes Tribal pesticides regulations	Coeur d'Alene Tribe	Chapter 46 of the Coeur d'Alene Tribal Code

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
Range and Livestock	Establishes regulations for range management on Tribal trust and allotted lands on the Reservation	Coeur d’Alene Tribe	Chapter 22 of the Coeur d’Alene Tribal Code
Religious Freedom	Establishes Tribal policy and law to protect American Indian religious freedom	Coeur d’Alene Tribe	Chapter 29 of the Coeur d’Alene Tribal Code
Smoke Management	Permit from the Tribe is required for agricultural field burning, prescribed fire management burning and landfill disposal site fires	Coeur d’Alene Tribe	Chapter 13 of the Coeur d’Alene Tribal Code
Timber Harvesting on Trust Lands	Timber Cutting permit or Contracts	Coeur d’Alene Tribe and BIA	FMP and Periodic update, 25 CFR part 163
Tribal Forest Management Plan	Management of Tribal Forest lands	Coeur d’Alene Tribe	Coeur d’Alene Tribal Resolution 70(2003) Dated 12/12/2002

Applicable Laws	*Action*	*Permitting Agency*	*Reference*
Water Quality Standards	Establishes Tribal Water Quality Standards	Coeur d'Alene Tribe and EPA	Coeur d'Alene Tribal resolution 82(99); Chapter 42 of the Coeur d'Alene Tribal Code as amended by Tribal resolution 307(2000).

C.0 Federal Laws and Regulations

Archaeological Resources Protection Act (ARPA)

This Act supplements the provisions of the 1906 Antiquities Act. The law makes it illegal to excavate or remove from Federal or Indian lands any archeological resources without a permit from the land manager. Permits may be issued only to educational or scientific institutions, and only if the resulting activities will increase knowledge about archeological resources. This IRMP will be consistent with the ARPA.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund)

The primary objective of the Superfund program is the cleanup of the worst abandoned hazardous waste sites in the country. Owners or operators of an inactive and/or uncontrolled hazardous waste site must notify the appropriate State official and convey information to them as to the nature of the site. States compile the information and submit it to the Environmental Protection Agency (EPA). The most serious sites will be placed on the National Priorities List (NPL). The purpose/use of the fund is to aid in the identification, assessment, and ultimate cleanup of abandoned hazardous waste sites when those responsible no longer exist, are unidentifiable, or lack the necessary funds for the cleanup.

Clean Air Act (CAA)

The purpose of this Act are to “protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare and the productive capacity of its population; to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to State and local governments for aid in the development and execution of air pollution control programs; and to encourage and assist the development and operation of regional air pollution control programs.” The Tribe will contact the appropriate regulatory agency to request a permit when there is a point source discharged into the air.

Federal Water Pollution Control Act (Clean Water Act—CWA)

The Clean Water Act strives to "restore and maintain the chemical, physical and biological integrity of the Nation's water." To achieve this objective the Act sets forth the goals eliminating and prohibiting the discharge of toxic pollutants into navigable waters of the United States. The basic means to achieving the goals of the Act is through a system of water quality standards, discharge limitations, and permits. The Act authorizes EPA to require owners and operators of point source discharges to monitor, sample and maintain effluent records.

If the water quality of a water body is potentially affected by a proposed action (i.e., construction activities that will obstruct, alter, or improve any navigable water or if discharge, dredge, or fill material is within the waters of the U.S. or adjacent to wetlands), a National Pollutant Discharge Elimination System (NPDES) permit (Section 402) may be required). If a project may result in the placement of material into waters, wetlands and riparian areas of the U.S., a Corps Engineers Dredge and Fill Permit (Section 404) may be required. A 401 certification must be obtained prior to being issued a NPDES and 404 permit.

Endangered Species Act (ESA)

It is the purpose of this Act to provide protection for animal and plant species that are currently in danger of extinction (endangered) and those that may become so in the foreseeable future (threatened). The Act allows protection of the listed species' critical habitat (the geographic area occupied by or essential to the species). The U.S. Fish and Wildlife Service and National Marine Fisheries Service share authority to list endangered species.

Federal Emergency Management Act (FEMA)

The Federal Emergency Management Administration administers FEMA, and is mandated to act with care to assure that, in carrying out its responsibilities, including disaster planning response and recovery and hazard mitigation and flood insurance, it does so in a manner consistent with the national environmental policies. Care shall be taken to assure, consistent with other considerations of national policy, that all practical means and measures are used to protect, restore, and enhance the quality of the environment, to avoid or minimize adverse environmental consequences.

FEMA should be contacted as early as possible in the planning process for guidance and scope when any structure or activity that may adversely affect the flood regime of a stream within a flood zone is taking place.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

The Federal Insecticide, Fungicide, and Rodenticide Act, is the basic law regulating the pesticides in the U.S. The Act regulates the marketing as well as the requirements for their use. EPA is responsible for regulation including the amount of residue of a pesticide which can remain on raw farm products. FIFRA requires all pesticides to be classified as restricted or general use. Only certified applicators or applicators under the direct supervision of a certified applicator may apply restricted use pesticides. Each state provides an individual certification program conducted by the State's Department of Agriculture or in some cases (such as on Indian Reservations) EPA may administer the program. County Agricultural Commission employees (e.g. Agriculture Specialists or Inspec-tors) commonly issue restricted materials permits and monitor compliance.

Forest and Rangeland Renewable Resources Research Act

The purpose of this Act is to serve the national interest by the establishment of a renewable resource program to provide a comprehensive assessment of present and anticipated use, demand for, and supply of renewable resources from the Nation's public and private forests and rangelands, through analysis of environmental and economic impacts, coordination of multiple use and sustained yield opportunities.

Hazardous Materials Transportation Act

The purpose of this Act is to regulate the transportation of all hazardous materials, including chemical and nuclear.

Indian Agricultural Resource Management Act

This Act was implemented to aid in the development and management of Reservation lands for agricultural development where it is in the best interest of the Tribal constituents and in the best interests of renewable resources, recreational opportunities, or urban needs.

Indian Land Consolidation Act

This Act instructs and designates consolidation of reservation lands in order to retain contiguous elements of traditional tribal lands or reservations.
Indian Mineral Leasing Act
This Act instructs the process for mineral leasing on reservation lands.

Indian Religious Freedom Act

This Act creates a policy for the government to protect and preserve American Indians' inherent right of freedom to believe, express, and exercise their traditional religions. It allows them access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rights.

Land Conservation and Restoration Act

This Act would implement programs that enable individuals to recognize, analyze, and resolve problems dealing with renewable resources and the restoration of those resources. This Act pertains to forestlands, rangelands, outdoor recreation opportunities, and urban areas.

Migratory Bird Treaty Act

This Act protects known migratory bird species including their nests and eggs from intentional harm or harassment. It mandates governments to assess impacts to migratory birds from any ground disturbing action.

National Environmental Policy Act (NEPA)

The Act establishes a national policy for the environment, to provide for the establishment of a Council on Environmental Quality. The purposes of this Act are: to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation. It requires environmental analysis and public disclosure of federal actions, including Environmental Impact Statements.

National Forest Management Act

This Act is an amendment to the Forest and Rangeland Renewable Resource Planning Act, which clarifies utilization of mills, wood wastes, reforestation, planning and transportation.

National Historic Preservation Act (NHPA)

This Act establishes a Federal Policy for the protection of historic sites and values in cooperation with other nations, states, tribes and local governments. It establishes a program of grants-in-aid to states and tribes for historic preservation activities. The State Historic Preservation Officer (SHPO) is the individual responsible for administering programs in the states. Many tribes also have Tribal Historic Preservation programs.

National Pollutant Discharge Elimination System

This an amendment to the Clean Water Act, which designates and controls discharge of substances into any waters or water bodies in the United States.

National Indian Forest Resources Management Act

The purpose of this Act is to allow the Secretary of the Interior to take part in the management of Indian forest land, with the participation of the lands' beneficial owners in a manner consistent with the Secretary's trust responsibility and with the objectives of the beneficial owners.

Native American Graves Protection and Repatriation Act

This Act pertains to Native American human remains and objects. The ownership or control of Native American cultural items which are excavated or discovered on Federal or tribal lands shall be given priority for associated funerary objects, in the lineal descendants of the Native Americans.

Pacific Northwest Electric Power Planning and Conservation Act (aka Northwest Power Act)

This Act addresses the impact on fish and wildlife of hydroelectric dams on the Columbia River. The Act establishes the Pacific Northwest Electric Power and Conservation Planning Council. It directs the Council to adopt a regional energy conservation and electric power plan and a program to protect, mitigate and enhance the fish and wildlife, including related spawning grounds and habitat, of the Columbia River and its tributaries, particularly anadromous fish.

Resource Conservation and Recovery Act (RCRA)

This is the basic law governing the disposal of solid waste and the regulation of landfills. It outlaws open dumps and requires the separate disposal of hazardous wastes.

Safe Drinking Water Act

The Safe Drinking Water Act provides for the safety of drinking water supplies throughout the United States by establishing National standards. EPA, states and tribes are responsible for enforcing the National Standards.

Soil and Water Resource Conservation Act of 1977

This Act addresses the growing and ongoing demand on soil, water, and related resources, including fish and wildlife habitats. The Act establishes natural resource conservation programs to assist landowners and users in developing sound soil, water and habitat conservation principles to further soil and water conservation. The policy and purpose of this Act is to conduct programs administered by the Federal government that will work toward the conservation of resources and be responsive to the long-term needs of the nation.

Surface Mining and Control Reclamation Act

In order to provide for the control and prevention of erosion and sediment damages from unreclaimed mined lands, and to promote the conservation and development of soil and water resources the federal government will enter into agreement with landowners, residents, and tenants, to determine land stabilization and conservation treatment.

Toxic Substances and Control Act

This Act gives EPA the ability to track the 75,000 industrial chemicals currently produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting or testing, or can ban those that may pose an environmental or human-health hazard.

C.1: Tribal Law and Policy

Boating on Tribal Waters

Regulates boat use on all waters on the Reservation. Requires all boat owners to obtain and display Certificates of Registration. Rules governing boat speed, driver alcohol use, restricted zones, etc., are included to maintain safety and ecology.

Cultural Resources Protection

Establishes the Tribal Cultural Resources Committee, an advisory committee to the Tribe’s Culture Department and the Tribal Council.

Eminent Domain

Authorizes condemnation of property for public purposes on the Reservation utilizing due process and providing for just compensation.

Encroachments

Specifies and regulates allowable uses of submerged lands and waters on the Coeur d'Alene Reservation in order to protect Tribal and public health, safety, water quality and quantity, navigation, fish and wildlife habitat, aquatic life, aesthetic beauty and Tribal values. Establishes a five-member Lake Board and an encroachment permit and fee schedule for various encroachment types (marinas, slip docks, piers, jetties, dikes, utilities, etc.).

Exclusion

Provides for exclusion of non-Tribal members from the Reservation under rare and extraordinary circumstances.

Firewood Cutting

Permit from the Tribe is needed for all firewood cutting on trust lands per Coeur d'Alene Tribal Resolution 188(2009).

Land Preservation and Consolidation

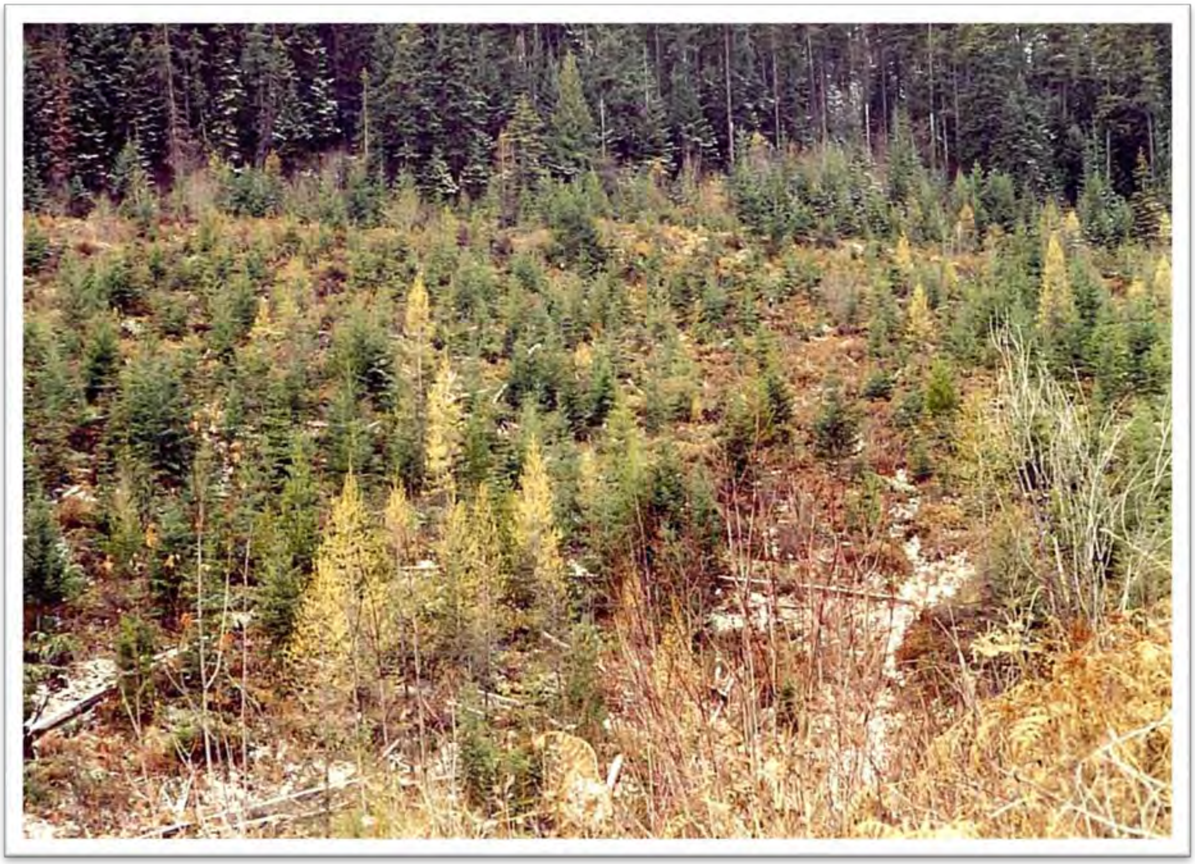
Establishes Tribal policy related to lands and waters within the Reservation in order to preserve and consolidate Tribal lands and resources.

Off-Reservation Hunting, Fishing, and Trapping

Describes the right of Tribal members to hunt and fish off-Reservation in the Tribe's aboriginal territory. Specifies the available species, enforcement capabilities of cooperating non-Tribal agencies, required Tribal permitting, prohibitions, and other regulations.

On-Reservation Hunting, Fishing, and Trapping

Manages fish and wildlife harvest and populations on the Reservation with a permit system for both Tribal and non-Tribal individuals. Includes other provisions such as restricted areas, allowable methods, enforcement, etc.



Re-forested clear-cut (photo by Kurt Mettler).

Pesticides

Establishes Tribal pesticides regulations on the Reservation.

Range and Livestock

Establishes regulations for range management on Tribal trust and allotted lands on the Reservation.

Religious Freedom

Establishes Tribal policy and law to protect American Indian religious freedom.

Smoke Management

Allows the management of smoke hazards from agricultural burning through a Smoke Management Plan, using an application, permitting, and burn prioritization process.

Tribal Forest Management Plan

Plans and guides forests and forestry on trust lands through 2017 (approved by Tribal Council Resolution 70(03) dated 12/12/2002). Sets goals for forest conditions such as stand density and old growth occurrence. Specifies allowable management techniques. Includes provisions for forest health, reserves, wildlife protection, and water resource protection.

Timber Harvesting on Trust Lands

Plans and guides timber harvest on trust lands through 2017. As described in 25 CFR section 163.13, the Tribal Logging Operation (TLO) is a Tribal forest enterprise and has the right of first refusal for timber sales on Tribal lands. Actual harvest will vary depending on analyses of alternatives by interdisciplinary teams and decisions by allotment owners and Tribal Council. Timber sales will be prepared to comply with 25 CFR Section 163 and Part 53 Indian Affairs Manual. Following timber sale preparation, presale marking and presale cruising are performed and a Forest Officer's Report (FOR) is prepared for each proposed timber sale estimated to exceed $15,000.00.

Water Quality Standards

The Coeur d'Alene Tribe's approval of water quality standards establishes standards covering those surface waters of Coeur d'Alene Lake and the St. Joe River within the exterior boundaries of the 1894 Coeur d'Alene Reservation (referred to herein as "Reservation TAS Waters"). These standards have been adopted pursuant to Sections 303 and 518 of the Clean Water Act and Chapter 42 of the Coeur d'Alene Tribal Code. These standards serve to protect the public health and welfare, enhance the quality of waters of the Coeur d'Alene Tribe, and serve the purposes of the Clean Water Act.

Appendix D

Tribal Forest Plan Standards and Guidelines

This Appendix contains Best Management Practices, Riparian Management Zone, Road Construction, and Snag Retention standards and guidelines.

Best Management Practices for Trust Forests Coeur d'Alene Reservation[1]

Acknowledgement: These Best Management Practices (BMP's) are adapted from Rules Pertaining to the Idaho Forest Practices Act, Idaho Department of Lands, Boise, Idaho, April 1, 2000 and Forestry BMP's for Idaho: Forest Stewardship Guidelines for Water Quality, University of Idaho Cooperative Extension System, (order copies at http://www.idahoforests.org/bmp). References to state law and the Land Board are omitted due to Tribal Sovereignty. Other changes include measures to comply with "Recommendations on Forest Riparian Buffer Strips for the Protection of Water Quality, Fish and Wildlife Resources on the Coeur d'Alene Reservation" by Coeur d'Alene Tribe Fish, Water & Wildlife Programs or other resource protection objectives of the Coeur d'Alene Tribe.

1. Timber Harvesting

1.1 Residual Stocking: Reforestation is required if harvesting reduces stocking of acceptable trees below the levels described in Section 3.3.

1.2 Soil Protection: The timber sale contract or timber cutting permit shall specify the logging method and type of equipment suited to protecting soils, based on the slope, landscape, road system, soil properties and silvicultural prescription within a cutting block or groups of cutting blocks within a timber sale.

1.2.1 Ground based skidding shall not be used where or when it would cause rutting, deep soil disturbance, or accelerated erosion. Unless approved by the Interdisciplinary Team for a specific project, crawler tractors shall not skid on slopes exceeding 45% gradient and rubber

[1] Excerpted from Coeur d'Alene Reservation Forest Management Plan 2003-2017 Appendix 7.5.

tired skidders shall not skid on slopes exceeding 25% average gradient.

- 1.2.2 Cable or aerial yarding shall be used on most sites with slopes exceeding 45%, those on unstable soils and on slopes exceeding 25% that are located between a road and a riparian management zone. Uphill cable yarding is preferred. Where downhill yarding is necessary, reasonable care shall be taken to lift the leading end of the log to minimize downhill movement of slash and soils.
- 1.2.3 In accordance with appropriate silvicultural prescriptions, designate skid trails in advance of cutting to provide permanent stand access. Average spacing between trails should not exceed 100 feet between trails, except at forks and landings. Mechanized harvesters may operate on narrower trail spacing, if soil compaction is limited through methods approved by the department.
- 1.2.4 Operator shall use existing skid trails in preference to new trails, except where existing trails violate BMP’s related to gradient, location or spacing.
- 1.2.5 Tractors used for skidding shall be limited to the size appropriate for the job and skid trail width should not exceed 10 feet average width.
- 1.2.6 Limit the grade of newly constructed skid trails to a maximum of 30%.

1.3 Landings & Trails: Locate landings, skid trails, and fire trails on stable areas to prevent the risk of material entering streams.

- 1.3.1 All new or reconstructed landings, skid trails (except at approved crossings) and fire trails shall be located outside the appropriate riparian management zones (buffer strips). Locate fire and skid trails where sidecasting is held to a minimum.
- 1.3.2 Minimize the size of each landing to that necessary for safe economical operations.
- 1.3.3 To prevent landslides, fill material used in landing construction shall be free of loose stumps and excessive accumulations of slash. On slopes where sidecasting is necessary, landings shall be stabilized by use of seeding, compaction, riprap, benching, mulching or other suitable means.

1.4 Drainage Systems: Provide and maintain a drainage system to control the dispersal of surface water and minimize erosion from each landing, skid trail or fire trail.

- 1.4.1 Whenever they are subject to erosion, stabilize skid trails and fire trails by water barring, cross draining, outsloping, scarifying, seeding and/or other suitable means. This work shall be kept current prior to fall and spring runoff to prevent erosion.

1.4.2 Reshape landings as needed to facilitate drainage prior to fall and spring runoff. Stabilize all landings by establishing ground cover or by some other means within one year after harvesting is completed.

1.5 Treatment of Waste Materials: All debris, overburden, and other waste material associated with harvesting shall be left or placed in such a manner as to prevent their entry by erosion, high water, or other means into streams.

1.5.1 Wherever possible, trees shall be felled, bucked and limbed is such a manner that the tree or any part thereof will fall away from any riparian management zone.

1.5.2 Remove slash and other debris that enters streams only at or near culvert inlets.

1.5.3 Deposit waste material from construction or maintenance of landings and skid and fire trails in geologically stable locations outside of the appropriate (stream protection) riparian management zone.

1.6 Stream Protection: Forest practice operations shall protect streambeds and streamside vegetation to leave them in the most natural condition possible to maintain water quality and aquatic habitat. Riparian management zones (RMZ) widths vary depending on stability of adjacent hillslopes, but should always encompass the 100-year floodplain. Until the Department delineates floodplain boundaries, the average widths for each stream class should serve as minimum requirements. Where the Department has delineated floodplain boundaries, do not reduce RMZ widths below the lower range of recommended widths or to the point that continuity of riparian areas is lost.

1.6.1 Ground based skidding in or through streams shall not be permitted. When streams must be crossed, adequate temporary structures to carry stream flow shall be installed. Cross the stream at right angles to its channel if possible. Remove temporary crossing immediately after use and, where applicable, water bar the ends of the skid trails.

1.6.2 Operation of ground-based equipment shall not be allowed within the riparian management zone except at approaches to approved stream crossings.

1.6.3 When cable yarding is necessary across riparian management zones, the department shall require measures to minimize disturbance to stream bank vegetation and channel.

1.6.4 Class I Streams

1.6.4.1 Class I riparian management zones shall range from 100 to 200 feet horizontally on both sides of the active channel. Average width should be 125 feet for streams adjacent to stable hillslopes and 150 feet for streams adjacent to moderate and unstable hillslopes.

- 1.6.4.2 The no harvest buffer shall consist of the innermost 100 feet for Class I streams, unless emergency needs can be addressed while meeting short term and long term goals for Large Organic Debris (LOD), shade, soil stability, wildlife cover and water filtering. When the riparian management zone extends beyond the no harvest buffer, the department will allow partial overstory removal consistent with the applicable silvicultural prescription. Harvesting within riparian management zones will only take place to promote the desired ecological components, and shall require a site-specific silvicultural prescription approved by the Interdisciplinary Team.
- 1.6.4.3 No mechanical entry by ground skidding equipment is allowed in the riparian management zone, except on authorized stream crossings. Skidding in or through the stream is prohibited.
- 1.6.4.4 Timber harvest adjacent to riparian management zones should use directional falling and other techniques to minimize debris loading into the channel. If logging slash accidentally accumulates in riparian management zones, leave it unpiled. Remove slash only in cases of extremely large deposits that create significant risks for aquatic or wildlife resources.
- 1.6.4.5 The interdisciplinary team may prescribe the use of fire within the riparian management zone to maintain or restore some plant communities.
- 1.6.4.6 Unless prescribed by the interdisciplinary team, forest practices shall not cut, slash or remove non-merchantable and sub-merchantable trees from the riparian management zone.
- 1.6.4.7 Snags in any riparian area will not be cut unless they pose a safety hazard during logging, site preparation or reforestation operations, or to public roads.
- 1.6.4.8 Road fill material and road building debris shall not be deposited where it may enter the riparian area.

1.6.5 Class II Streams

- 1.6.5.1 On Class II steams with stable ratings for adjacent hillslopes, riparian management zones shall range from 30 to 70 feet horizontally on both sides of the active channel, with an average width of 50 feet. Those streams with moderate or unstable ratings will have a riparian management zone ranging from 50 to 100 feet with an average width of 75 feet. Distances are measured horizontally from the active channel on both sides.
- 1.6.5.2 The no harvest buffer shall consist of the innermost 50 feet for Class II streams, unless emergency needs can be addressed while

meeting short term and long term goals for LOD, shade, soil stability, wildlife cover and water filtering. When the riparian management zone extends beyond the no harvest buffer, the department will allow partial overstory removal consistent with the applicable silvicultural prescription. Harvesting within riparian management zones will only take place to promote the desired ecological components, and shall require a site-specific silvicultural prescription approved by the Interdisciplinary Team.

1.6.5.3 No mechanical entry by ground skidding equipment is allowed in the riparian management zone, except on authorized stream crossings. Skidding in or through the stream is prohibited.

1.6.5.4 Timber harvest adjacent to riparian management zones should use directional falling and other techniques to minimize debris loading into the channel. If logging slash accidentally accumulates in riparian management zones, it shall be left in place and not piled. Slash should be removed only in cases of extremely large deposits that are judged to create significant risks for aquatic or wildlife resources.

1.6.5.5 The interdisciplinary team may prescribe the use of fire within the riparian management zone to maintain or restore some plant communities.

1.6.5.6 Unless prescribed by the interdisciplinary team, forest practices shall not cut, slash or remove non-merchantable and sub-merchantable trees from the riparian management zone.

1.6.5.7 Snags in any riparian area will not be cut unless they pose a safety hazard during logging, site preparation or reforestation operations, or to public roads.

1.6.5.8 Road fill material and road building debris shall not be deposited where it may enter the stream.

1.6.6 Class III Streams, Springs and Seeps

1.6.6.1 Along streams with stable and moderately stable hillslopes, riparian management zones shall range from 0 to 50 feet wide horizontal distance on both sides of the active channel. Along streams with unstable hillslopes, riparian management zones range from 25 to 75 feet wide, with an average width of 50 feet horizontally on each side of the active channel.

1.6.6.2 Most overstory trees may be removed in Class III riparian management zones with stable or moderately stable hillslopes. Up to 50% of the overstory may be harvested from riparian management zones with unstable hillslopes. Reserve trees from harvest in the immediate vicinity of locally unstable areas.

Distribute leave trees along the stream in locations that maximize the resistance to debris flows and floods.

1.6.6.3 Unless prescribed by the interdisciplinary team, forest practices shall not cut, slash or remove non-merchantable and sub-merchantable trees from the riparian management zone.

1.6.6.4 The Interdisciplinary Team may prescribe the use of fire within the riparian management zone to maintain some plant communities.

1.6.6.5 Snags should be retained in riparian management zones, but safety hazards for recreational or commercial forest users may be cut and left on the ground in the riparian area or stream channel.

1.7 Maintenance of Productivity and Related Values: Harvesting practices will be designed to assure the continuous growing and harvesting of forest tree species by suitable economic means and also protect soil air, water, and wildlife resources.

1.7.1 Where major scenic attractions, highways, recreation areas or other high-use areas are located within or traverse forestland, consider scenic values by prompt cleanup and regeneration.

1.7.2 The Interdisciplinary Team shall consider preserving any critical wild-life or aquatic habitat. Timber sale planners shall consult the U.S. Fish and Wildlife Service regarding threatened and endangered species. Wherever practical, preserve fruit, nut, and berry producing trees and shrubs.

1.7.3 Avoid conducting operations along bogs, swamps, wet meadows, springs, seeps, wet draws or other sources where the presence of water is indicated, protect soil and vegetation from disturbance which would cause adverse affects on water quality, quantity and wildlife and aquatic habitat.

1.7.4 Whenever practical, as determined by the Interdisciplinary Team, plan regeneration cuts so that adequate wildlife escape cover is available within one-quarter (1⁄4) mile.

1.7.5 The Interdisciplinary Team shall consult the Tribal Cultural Committee and the Tribal Culture Department[2] to establish protection for any known cultural resources. Cultural Resource surveys shall precede timber sales to search for cultural resources not previously identified. Timber sale contracts require that the purchaser suspend operations if cultural sites are found in the operating area. The department may establish no treatment buffers or other protective measures for the cultural resources.

[2] This is an update to the Tribe's Forest Management Plan because the Culture Department did not exist when the FMP was developed.

1.7.6 Areas proposed for forest management activities will be reviewed by the Natural Resources Committee and Cultural Affairs Committee to determine whether sites used for gathering food or medicinal plants would be affected. Specific protection or enhancement measures will be developed and implemented as needed.

2. Road Construction, Reconstruction and Maintenance

2.1 Consult the Coeur d'Alene Tribal Forest Road Management Policy, which provides standards and guidelines for road construction, reconstruction and maintenance.

3. Residual Stocking and Reforestation.

3.1. Quality of Residual Stocking: On any operation, trees left for future harvest shall be of acceptable species and adequately protected from harvest damage to enhance their survival and growth. This may be accomplished by locating roads and landings and by conducting felling, bucking, skidding, yarding, and decking operations so as to minimize damage to residual trees. Acceptable residual trees should have a minimum live crown ratio of thirty (30%), minimum basal scarring, and should not have dead or broken tops. When stands have a high percentage of unacceptable trees, consider stand replacement rather than intermediate cuttings.

3.2. Sites Unpractical to Plant: Sites unpractical to plant, generally ponderosa pine and drier Douglas-fir habitat types, shall not be harvested below minimum stocking, unless the site is converted to some other land use.

3.3. Stocking: Stocking will be deemed satisfactory immediately following harvest if the following number of acceptable trees per acre, for at least one (1) size class, are reasonably well-spaced over the area affected by forest harvesting (NOTE: DBH = Average Diameter (outside of the bark) of a tree four and one half (4.5) feet above uphill ground level):

Table E.3.3 Minimum Stocking Levels by Average Stand DBH

Average DBH in inches	*Mininum Number of Trees per acre*	*Average Spacing in feet*
2.9 and smaller	170	16 x 16
3.0 and greater	110	20 x 20
5.0 and greater	60	27 x 27
8.0 and greater	35	35 x 35
11.0 and greater	20	47 x 47

3.4. Reforestation: Reforestation is required for stands where harvesting reduces stocking below the levels described in Table 3.3. Planting and/or natural regeneration shall establish at least 200 seedlings per acre within 5 years after planting (or harvest for natural regeneration). Supplemental planting shall continue until the stocking levels meet the minimums in Table 3.3.

3.5. Reforestation Exemptions: Reforestation is not required for:

- 3.5.1. Land converted to another use. This may include land converted to roads used in a forest practice.
- 3.5.2. An opening less than two (2) acres in size that is below minimum stocking levels.
- 3.5.3. On lands exempted under Subsection 3.5 where reforestation is not being planned, some form of grass or planted cover shall be established within one (1) year in order to maintain soil productivity and minimize erosion.

4. Use of Chemicals and Petroleum Products

4.1. Purpose. Chemical products can perform important functions in the growing and harvesting of forest tree species. The purpose of these rules is to regulate handling, storage and application of chemicals in such a way that the public health and aquatic and terrestrial habitats will not be endangered by contamination of streams or other bodies of water. The application of pesticides shall comply with the Coeur d'Alene Tribal Code, Chapter 46: Pesticides and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

4.2. Petroleum Products: Petroleum storage containers with capacities of more than two hundred (200) gallons, stationary or mobile, will be located no closer than one (100) feet from any stream, watercourse, lake, or area of open water. Dikes, berms or embankments will be constructed to contain at least one hundred ten percent (110%) of the volume of petroleum products stored within the tanks. Storage areas will be impervious and of adequate capacity to contain spilled petroleum products. In the event any leakage or spillage enters any stream, watercourse, lake or area of open water, the operator will immediately notify the department.

- 4.2.1. Transferring Petroleum Products. During fueling operations or petroleum product transfer to other containers, there shall be a person attending such operations at all times. Fueling operations should not take place where, if spillage occurs, the fuel will enter streams, lakes or other areas of open water.
- 4.2.2. Equipment and containers used for transportation, storage or transfer of petroleum products shall be maintained in a leak proof

condition. If the department determines there is evidence of petroleum product leakage or spillage, the use of such equipment shall be suspended until the deficiency has been corrected.

- 4.2.3. Waste resulting from logging operations, such a crankcase, oil, filters, grease, oil containers, or other non-biodegradable waste shall be removed from the operating area and disposed of properly.

4.3. Certification/Licensing. Certification is required of individuals who apply or distribute restricted use pesticides. Certification is also required of individuals who apply a pesticide as a commercial applicator. The Coeur d'Alene Tribe will recognize Environmental Protection Agency approved pesticide certification. This requirement does not pertain to individuals applying general use pesticides on their own property.

4.4. Maintenance of Equipment:

- 4.4.1. Equipment used for transportation, storage or application of Chemical products shall be maintained in leak proof condition. All pesticide application equipment will be made available for inspection by the Pesticide Program Manager or a designated agent of the Tribe.
- 4.4.2. The storage of pesticides and pesticide containers shall conform to Section 46-16.01 of the Tribal Code.

4.5. Mixing:

- 4.5.1. When water is used in mixing Chemical products:
  - 4.5.1.1. Provide an air gap or reservoir between the water source and the mixing tank.
  - 4.5.1.2. Use uncontaminated tanks, pumps, hoses and screens to handle and transfer mix water for utilization in pesticide operations.
- 4.5.2. Mixing and landing areas:
  - 4.5.2.1. Mix Chemical products and clean tanks and equipment only where spills will not enter any water source or streams.
  - 4.5.2.2. Landing areas shall be located where spilled Chemical products will not enter any water source or stream.
  - 4.5.2.3. Rinsate and wash water should be recovered and used for make-up water, be applied to the target area, or disposed of according to Tribal, state and federal laws.

4.6. General Pesticide Use Restrictions. Tribal Council may by resolution restrict or prohibit the use of pesticides if necessary to prevent injury to people or the environment. Current restrictions are listed in Chapter 46-Section 11.01 of the Tribal Code.

4.7. Aerial Application.

- 4.7.1. Aerial application restrictions are listed in Chapter 46- Section 12.01 of the Tribal Code.

4.7.2. With the exception of pesticides approved for aquatic use and applied according to labeled directions, when applying pesticide leave at least one (1) swath width (minimum one hundred (100) feet) untreated on each side of all Class I streams, flowing Class II streams and other areas of open water. When applying pelletized fertilizer, leave a minimum of fifty (50) feet untreated on each side of all Class I streams, flowing Class II streams, and other areas of open water.

4.7.3. Use a bucket or spray device capable of immediate shutoff. Shut off chemical application during turns and over open water.

4.8. Ground Application with Power Equipment.

4.8.1. With exception of pesticides approved for aquatic use and applied according to labeled directions, when applying pesticide, leave at least twenty-five (25) feet untreated on each side of all Class I streams, flowing Class II streams and areas of open water.

4.8.2. When applying fertilizer, leave at least ten (10) feet untreated on each side of all streams and areas of open water.

4.9. Hand Application.

4.9.1. Apply only to specific targets; such as, a stump, burrow, bait, or trap.

4.9.2. Keep Chemical products out of all water sources or streams.

4.10. Limitations on Applications.

4.10.1. Chemical products shall be applied in accordance with all limitations and instructions printed on the product registration labels, supplemental labels, and others established by regulation of Tribal Council.

4.10.2. Do not exceed allowable rates.

4.10.3. Prevent direct entry of Chemical products into any water source or stream.

4.11. Daily Records of Chemical Applications.

4.11.1. When restricted use pesticides are applied on forest land, the operator shall maintain a daily record of spray operations which includes:

4.11.1.1. Date and time of day of application.

4.11.1.2. Name and address of owner of property treated.

4.11.1.3. Purpose of the application (control of vegetation, control of tussock moth, etc).

4.11.1.4. Contractor’s name and pilot’s name when applied aerially. Contractor’s name or applicator’s name for ground application.

4.11.1.5. Location of project (section, township, range and county; or other system authorized by Chapter 46- Section 6.01(A)(1)(3) of the Tribal Code).

4.11.1.6. Air temperature (hourly).
4.11.1.7. Wind velocity and direction (hourly).
4.11.1.8. Pesticides used including trade or brand name, EPA product registration number, mixture, application rate, carrier used and total amounts applied.

4.11.2. Whenever fertilizers or soil amendments are applied, the operator shall maintain a daily record of such application as described above in Subsection 4.10.1, but 4.10.1.8 shall include the name of the fertilizer or soil amendment and application rate.

4.11.3. The records required in Subsection 4.10 shall be maintained for three years in compliance with Chapter 46- Section 6.01(D) of the Tribal Code.

4.11.4. All records required in Subsection 4.10 shall be retained for three (3) years.

4.12. Container Disposal. Chemical containers shall be cleaned and removed from the forest and disposed of in a manner approved by the director in accordance with applicable local, state and federal regulations; or removed for reuse in a manner consistent with label directions and applicable regulations of a state or local health department. Open burning of containers is prohibited.

4.13. Spill. Spills shall be reported and appropriate cleanup action taken in accordance with Chapter 46- Section 15.01 of the Tribal Code.

4.13.1. All chemical accidents and spills shall be reported immediately to the Pesticide Program Manager or Natural Resource Department (both at 208-686-1800) as soon as it is safe to do so. If necessary notify emergency services at 911 as soon as possible. Many pesticide labels also have an important emergency telephone number to call in case of spills.

4.13.2. If chemical is spilled, appropriate procedures shall be taken immediately to control the flow of material being spilled and contain the released material, provided it can be done in a safe manner.

4.13.3. It is the applicator's responsibilities to collect, remove, and dispose of the spilled material in accordance with applicable Tribal and federal rules and regulations and in a manner recommended or approved by the Pesticide Program Manager or Natural Resource Department.

4.14. Misapplication. Whenever Chemical products are applied to the wrong site or pesticides are applied outside of the directions on the product label, it is the responsibility of the applicator to report these misapplications immediately to the director.

5. Slash Management

5.1. Commercial and Non-commercial Slash. Fuels and debris resulting from any forest practice shall be managed as set forth in the Coeur d'Alene Tribal Fuel Management Plan and Fire Management Plan.
5.2. Slash shall not be burned without a burn plan during the "fire season", normally from May 20 to October 10 of each year. Before May 20 or after October 10, a burn plan is required for broadcast or jackpot burns, and for slash piles.

6. Prescribed Fire

6.1. Prescribed fire shall be used in accordance with the Coeur d'Alene Tribal Fuel Management Plan and Fire Management Plan.
6.2. A written burn plan for each project on Tribal or allotted forestland must be approved by the Tribal Fire Management Officer and other officers, as required by the Bureau of Indian Affairs.
   6.2.1. A copy of each approved burn plan will be forwarded to the Idaho Department of Lands.
   6.2.2. The Burn Boss will have a copy of the approved burn plan during burning, and another copy will be on file with the Tribal Forestry.
   6.2.3. Changes in burn plan requirements or prescription elements will be documented by the Burn Boss. Changes will be approved by the Prescribed Fire Manager.
6.3. The Burn Boss will notify Tribal Forestry (Dispatch) prior to ignition on any burn unit.
6.4. The Burn Boss will regularly inform Tribal Forestry (Dispatch) of progress and significant events (start time, stop time, wind changes, slop over).
6.5. The Burn Boss or Prescribed Fire Manager will declare slop over fires, as opposed to spot fires.
6.6. All slop over fires will be 100% mopped up.

Excerpts from the Tribe's Riparian Management Buffers Standards and Guidelines[3]

1.1.1 Stream Classification

Riparian buffer recommendations to protect aquatic resources are most commonly based on a stream classification scheme. Several classification schemes were reviewed to determine an appropriate model for the Reservation, including the classifications adopted by the forest practices acts of Idaho, Washington, Oregon, and California; USDA Forest Service; Colville Confederated Tribes; and Pacific Rivers Council Forest Practices Guidelines. The purpose and need for adopting a classification scheme on the Coeur d'Alene Reservation is to designate a Riparian Management Zone (RMZ) along streams and wetlands where management prescriptions are made that will minimize the effects of nearby logging and related land disturbance activities.

The proposed classification scheme and definitions for each class is as follows:

- Class I—All perennial streams, i.e. ones that flow continuously throughout the year. Synonymous with permanent stream.
- Class II—All intermittent or seasonal streams draining basins of 1⁄2 square mile or more (>320 acres). Intermittent streams are ones that flow only at certain times of the year, such as when the ground water table is high and/or when it receives water from springs or from some surface source such as melting snow. It ceases to flow above the streambed when losses from evaporation or seepage exceed the available streamflow.
- Class III—All intermittent or seasonal streams draining basins of less than 1⁄2 square mile (<320 acres).

The above classification scheme has been simplified so that it can be correctly applied using 7.5 minute quadrangle maps published by the U.S. Geological Survey or by using the Tribal GIS database. A classification that is made

[3] Excerpted from Coeur d'Alene Reservation Forest Management Plan 2003-2017 Appendix 7.4.

using this scheme is accomplished independent of additional resource information (e.g., presence or absence of certain fish or wildlife species). It is our intent to avoid incorrect classifications attributed to the seasonal usage or migration by certain animal species. In addition, current management standards and guidelines should allow for attainment of maximum resource potentials regardless of prior management history. For some forest and agricultural lands, this may require recovery of riparian resources to allow for recolonization by plant and animal species that are important to the Tribe.

1.1.2 Overall Objectives for the Riparian Management Zone (RMZ)

Forestland management with regard to the RMZ focuses on four major areas of issues and opportunities: 1) minimizing the potential for cumulative effects; 2) maintaining potential inputs of woody debris; 3) maintaining continuous riparian corridors, with structurally complex plant communities; and 4) rehabilitating degraded riparian resources within individual watersheds to the maximum extent.

In Class I and II streams, the geomorphic objectives of riparian management are to maintain the physical characteristics of the stream channel and floodplain and to minimize delivery of sediment to the channel. In Class III streams, geomorphic objectives are designed to protect downstream riparian-dependent resources. Management should not change the existing geomorphic structure of stream channels. Maintenance of the following characteristics of stream configuration will help ensure long-term stream stability:

- Width and depth
- Stream course
- Channel gradient
- Streambed topography
- Streambed and bank materials
- Large woody debris

Maintenance of floodplain functions is an extremely important and frequently overlooked component of riparian management. Deposits of sediment during extremely high flood events form floodplains. Riparian vegetation protects these areas, and removal of this vegetation through harvest or road construction makes them vulnerable to massive erosion during subsequent floods. The riparian management zone should include the entire floodplain. Failure to do so will seriously jeopardize riparian management objectives during major floods.

Of all the ecological functions of riparian areas, the process of woody debris loading into channels and floodplains requires the longest time for recovery after harvest. Although young forests begin to deliver woody debris after several decades, large conifer logs cannot be provided by forests less than a century old (Gregory and Ashkenas 1990). Most future riparian functions will be guaranteed if natural abundances and distributions of all sizes of woody debris are maintained in streams, floodplains, and lower hillslopes.

Large woody debris is contributed to the active channel by adjacent riparian forest. Recent studies of streams in old growth and mature forests indicate that 90% of the large wood in the channel originated within 92 feet of the stream margin (McDade et al. 1989). For large woody debris management alone, RMZ widths of approximately 100 feet are required to maintain long-term inputs to streams. Additional consideration of floodplain functions and wildlife habitats may require even wider management zones. Woody debris is also important in intermittent and small ephemeral streams (Class II and III), especially where adjacent hillslopes show signs of instability. In these small channels, woody debris in the channel and on the banks stabilizes the stream and creates new habitat within debris flows when they occur.

Where timber harvest is permitted along streams (some Class III streams) large amounts of woody debris may accumulate locally. Logging slash has the potential to retard streamflow, reduce dissolved oxygen concentrations, dam culverts, and initiate landslides and debris may accumulate locally. Logging slash has the potential to retard streamflow, reduce dissolved oxygen concentrations, dam culverts, and initiate landslides and debris flows. At the same time, large pieces of wood add to the physical stability of the channel, and small debris is redistributed and stored by high flows. Appropriate riparian management avoids substantial delivery of wood, and excessive debris loading should not occur. Removal of debris often causes more erosion than the slash would cause in transport, and frequently damages the stream channel and riparian vegetation. Slash should be removed only in cases of extremely large deposits that are judged to create significant risks for aquatic or wildlife resources.

In agricultural lands where close proximity of forests can limit crop production, a zone of herbaceous plants or grass between the forested riparian habitats and the agricultural crops may be incorporated into the Riparian Management Zone. This grassed zone could minimize both the shading of crops and loss of soil moisture to the forest as well as limit intrusion from riparian deciduous forest species into the agricultural fields.

1.1.3 Riparian Management Zone Boundaries by Stream Class

For optimal management of riparian resources, riparian management zones should have variable widths that are delineated at ecological boundaries, not at arbitrary distances from the stream (Belt et al. 1992; Gregory and Ashkenas 1990). Riparian areas are naturally irregular in shape in response to local topography, geology, groundwater, and plant communities. Consideration of topographic irregularities can protect riparian resources and simplify harvest unit, agricultural field or development layout. For each stream class, the width of riparian management zones will vary depending on the slope stability rating. Locally, boundaries may be less than the recommended average width, but they should not be reduced below the lower range of recommended widths or to the point that continuity of riparian areas is lost. These boundaries are designed to maintain and enhance stream temperatures, ensure local channel stability, retard flow of debris, reduce sediment transport and provide some input of large woody debris and terrestrial food resources where appropriate. Until such time when the 100-year floodplain can be properly delineated for all Reservation waterbodies, the recommended average widths should serve as minimum requirements.

- **Class I Streams**—Recommended widths of riparian management zones along Class I streams range from 100-200 feet horizontally on both sides of the active channel. Average width should be 125 feet for streams adjacent to stable hillslopes and 150 feet for streams adjacent to moderate and unstable hillslopes. In most forested cases, these distances will encompass the entire 100-year floodplain. On some large stream systems (e.g., mainstem Hangman, Rock and Benewah Creeks), a portion of the floodplain may extend beyond the 200-foot riparian management zone. These large stream systems are generally within stable hill-slopes and the average 125-foot buffer should apply. The outer 25 feet of this RMZ could be populated by herbaceous plants or grass. As with all RMZs, the landscape along these large stream systems should be evaluated and managed accordingly.

- **Class II Streams**—Riparian management zones on Class II streams will vary depending on the soil stability rating for adjacent hillslopes. Those streams with stable ratings will have a riparian management zone ranging from 30-70 feet with an average width of 50 feet. Those streams with moderate or unstable ratings will have a riparian management zone ranging from 50-100 feet with an average width of 75 feet. Distances are measured horizontally from the edge of the active channel on both sides. The 50-foot average width for stable streams would generally apply to agricultural lands, however these landscapes should be evaluated and managed accordingly.
- **Class III Streams/Drainages**—Along forested streams with stable and moderately stable hillslopes, riparian management practices are designated for a zone ranging from 25 to 50 feet wide extending horizontally on both sides of the active channel. Along streams with unstable hillslopes, riparian management zones range from 25-75 feet wide, with an average width of 50 feet. Within small acreage drainages in agricultural lands the entire RMZ could be managed as a grassed waterway. A grassed waterway should be engineered for a minimum capacity required to convey the peak runoff expected from a storm of 10-year frequency, 24-hour duration as per Natural Resources Conservation Service Conservation Practice Standard Grassed Waterway Code 412.

1.1.4 Management within the Riparian Management Zone

- **Timber Harvest**—The levels of allowable timber harvest within the riparian management zones differ by stream class.

  No overstory removal is permitted within the innermost portion of the riparian management zones on Class I and II streams. This no harvest buffer will consist of the innermost 100 feet for Class I streams and the innermost 50 feet for Class II streams. When the riparian management zones for these respective stream classes extend beyond the no harvest buffer, partial overstory removal will be allowed in a manner that is consistent with silvicultural prescriptions for the surrounding timber stand. This policy is designed to ensure that management objectives associated with stream temperature and large woody debris recruitment are achieved.

  Partial harvest of overstory trees (<50% of the stand in the riparian management zone) is permitted on Class III streams with unstable hillslopes. Trees should not be harvested in the immediate vicinity of locally unstable areas. Trees left within areas of partial harvest should be distributed along the reach in locations that maximize the resistance to debris flows and floods.

Complete removal of overstory trees is permitted in Class III streams with stable or moderately stable hillslopes.

- **Salvage**—In general, timber should not be salvaged from any riparian area, except where necessary to accomplish riparian objectives. Given the numerous functions and benefits of riparian vegetation and woody debris, there are few reasons to remove salvaged timber from riparian areas. Treatment of standing trees, snags, and downed logs in riparian areas should be based on meeting objectives for fish and wildlife species.

  Trees damaged or killed by blowdown, fire, disease, or insect outbreaks should be retained to maintain biological diversity and to provide future snags and downed woody debris.

  Trees that present safety hazards for recreational or commercial forest users may be felled to eliminate the hazard, but should be left on the ground in the riparian area or in the stream channel.
- **Blowdown**—Blowdown is not a management failure and downed trees should not be removed from riparian management zones. The zone is designed for the trees to die and fall into the stream channel, and windthrow is the most common source of natural debris loading.

  If catastrophic blowdown creates a detrimental situation for riparian-dependent resources (e.g., barriers to fish migration, unplantable conditions, etc.), modification of the debris accumulation can be considered for specific cases. Partial debris removal is preferable to complete salvage. Managers should modify debris accumulations as little as possible to achieve the desired conditions.
- **Shade Management**—No trees that provide shade to Class I or II stream channels shall be removed. Along all streams where complete or partial harvest is permitted within the riparian management zone, understory vegetation should be maintained to the maximum extent possible for shade to maintain cool water temperature.
- **Residue Management**—Large woody debris is absolutely crucial to numerous riparian functions over both the short-term (seasons to decades) and long-term (decades to centuries) life of the forest. The policy of no harvest in certain portions of the riparian management zone is designed to guarantee the long-term supply of woody debris to wetlands, streams and floodplains.

  Logging slash should not present a problem in wetlands or Class I and II stream channels because no timber harvest is allowed within these riparian management zones. Direct inputs of logging slash should be minimal, and riparian zones will intercept slash from upslope harvest units.

Timber harvest in areas immediately adjacent to streams often adds quantities of slash and large debris to channels; this is most likely to occur along Class III streams. Timber harvest in these areas should use techniques that minimize debris loading into the channel (e.g., directional falling, log suspension, minimal site disturbance).

Managers should be cautious about removing slash from any riparian management zone, stream channel, or wetland. If residue accidentally accumulates in riparian zones, it should be left in place and not piled. No clean up should be prescribed for any stream, lake or wetland under normal conditions.

Broadcast burning normally should not be prescribed to extend into the riparian management zone. The fire line should be located well away from the riparian management zone to avoid disturbance from burning and soil compaction. Prescribed use of fire within the riparian management zone may be recommended to maintain some riparian plant communities. Riparian areas are noted for their resistance to burning, but if fuel loading is a concern at a particular location, slash in the riparian area can be hand piled outside the riparian management zone and burned.

- **Landing Location**—Landings should always be located outside riparian areas and beyond a point where sidecast could enter the riparian area. Landing sites should be selected based on the least amount of excavation and erosion potential.
- **Timing of Activities**—Seasonal impacts of logging activities need to be evaluated. Those that may generate excessive fine sediment should be carried out in dry periods of the year so erosion control practices can be completed before the rainy season.

  From February 15 through July 1, logging-related sedimentation is more likely to interfere with cutthroat trout spawning, incubation of eggs in the gravels, or emergence of fry. Therefore, construction activities in the stream (e.g., bridges, culverts, rehabilitation structures) normally should be limited to the period between July 1 and February 15. Activities outside the channel but likely to contribute sediment to stream channels should adhere to the same operating season and should use special installations to prevent sediment from reaching the stream.

  Bull trout begin spawning in September: therefore, construction activities should be completed before September 1 in reaches they use for spawning.
- **Herbaceous Plant or Grassed Borders in RMZ's for Class I Streams in Agricultural Lands**—The herbaceous or grass border is a no tillage zone that may be harvested but should not be burned.

- **The Grassed Waterways of Class III Drainages in Agricultural Lands**— These vegetated drainage bottoms are established to trap sediments during all seasons and should not be tilled, harvested or burned.
  Grazing may be allowed in riparian areas, however the high palatability of riparian forage plants along with readily accessible water during the dry season makes riparian areas the focus of cattle grazing and foraging activities during a time when they are particularly susceptible to damage. Stream bank trampling, loss or reductions in the shrub component (particularly willow [Salix spp] and red-osier dogwood [Cornus stolonifera]), and reductions in regeneration of overstory tree species are undesirable effects of grazing that can be avoided with proper management. The development of off stream channel water sources, placement of trace minerals (salt licks) away from water sources, fencing and grazing rotation are some tools that can be employed to prevent riparian degradation.

EXCERPTS FROM TRIBAL FOREST ROAD MANAGEMENT POLICY[4]

1: Project Roadwork Planning

1.1: Road Maintenance and Reconstruction Plan

1.1.1 Develop and implement a plan for maintenance of access and main haul routes in the project area to address short term and long term use. I.e., maintenance to include placement of or cleaning of culvert ends, road surface treatment; spot rocking, surface blading for draining and dust abatement. Adequate surfacing to allow wet season use or winter road closure.

1.1.2 Develop a priority list for road reconstruction or realignment, road prism and drainage system design. Chronic problem areas to be reviewed by IDT members, i.e.; landslides, stream crossings and small culverts.

1.1.3 Develop a Road Plan Map with site locations, guidelines and specifications according to IDT findings. Map to be part of the contract. A road plan document will include a Table to list the work to be performed.

[4] Excerpted from Coeur d'Alene Reservation Forest Management Plan 2003-2017 Appendix 7.7.

1.1.4 Road closure plans will be identified in the planning process, to be implemented at the completion of annual operations, or the road will be adequately waterbarred and rocked if year round access is proposed.

1.2: Work Schedule & Communication

1.2.1 A pre-work conference will be held after the contract is signed, before any work is performed. The contractor, operators, IDT members and the contract administrator will be present.

1.2.2 A work schedule to be developed by contractor and approved by IDT at the PreOperations meeting, to ensure the contractor adequately carries out plans.

1.2.3 Communications: Contractor or operators will communicate with Contract Administrator as to their daily work location and equipment use, for monitoring to take place.

1.3: Monitoring

1.3.1 Monitoring Plan: To insure compliance with the EA a road plan is to be prepared by the Sale Administrator prior to awarding contract. The contract, Road Plan & timeline schedule will be reviewed for compliance with the EA before, during and after road construction and harvest activity.

1.4: Work Inspections & Amendments

1.4.1 AN INSPECTION will be performed periodically by the sale administrator or roads manager to insure the roadwork is relative to the road plan.

AMENDMENT/WORK CHANGE PROPOSAL: Practices may be proposed that are in-lieu of specific mitigation measures, but these practices must provide equal or greater protection than the mitigation measures. All in-lieu practices must be approved by the IDT. The contract Administrator is responsible for notifying the IDT. Contractors and operators are responsible to the Contract Officer. (Table 4 was actually an illustration at the end of the Road Mgt. Policy, that has not been included in this version)

1.5: Road Surface Stabilization & Rocking

1.5.1 High use PRIMARY roads expected to be used during the winter season shall receive rock surfacing except in heavy rock areas. High traffic roads in critical watershed areas, shall receive a surface coat of gravel to prevent sediment erosion into priority watersheds and sensitive fish habitat.

1.5.2 Most SECONDARY roads would receive no rock surfacing, with poorly drained or weak soil areas receiving spot rocking. Roads with a soil surface shall be closed during the wet season or gated if logging operations are completed in sensitive priority watershed areas.

1.5.3 Road grades: Surface stabilization should be considered for all grades in excess of 14% and adverse grades in excess of 10%. Spot rocking and gravel surfacing to protect soils from saturation.

1.6: Seasonal Standards & Guidelines: Wildlife

Consultation with the Tribal wildlife biologist is recommended for any road construction activity and proposed amendments.

1.7: Seasonal Standards & Guidelines: Watershed

1.7.1 Hauling and skidding operations shall stop when surface rutting or excessive mud is produced and causes road damage, or when vehicles require traction devices.

1.7.2 Operating season limitations during significantly wet conditions will be imposed. Impacts to water quality, roads, landings, and soils will be mitigated or deferred. IDT review and contract administration will monitor conditions.

1.7.3 Daily installation of water bars and erosion control measures during the winter period will be required. At all other times, erosion control measures shall be installed when there is a chance of rainfall in excess of 1⁄2".

1.7.4 Upon completion of seasonal operations, the road surface shall be crowned, outsloped, insloped, or water-barred. Remove berms from the outside edge where runoff is channeled.

1.7.5 Timing of stream crossing installation: Work shall be performed as quickly as possible during the dry period of summer, when streamflows are at a minimum and there will be minimal soil disturbance and risk of sedimentation.

1.7.6 All road construction activities, including the installation of stream crossings and erosion control work, shall be completed before the onset of the rainy period. Likewise, all temporary stream crossings shall be removed and all erosion control measures installed before the winter begins.

1.8: Watershed Protection

1.8.1 Road maintenance guidelines shall give priority to sensitive fisheries habitat and domestic use watersheds. Watershed protection shall be planned to include special mitigation developed by the IDT or Total Maximum Daily Load implementation plans.

1.8.2 Maintain erosion, control features through periodic inspection and maintenance, including cleaning dips and crossdrains, repairing ditches, marking culvert inlets to aid in location, and clearing debris from culverts.

1.8.3 Avoid using roads during wet periods if such use would likely damage the road drainage features. Preventative maintenance can reduce the occurrence of culvert plugging. In recently logged areas, floatable debris should be cleaned from drainage ditches that direct water to culverts. Hand, shovel and chainsaw work are usually all that culvert maintenance requires. Delays in cleaning a blocked culvert or ditch can result in a damaged road which requires costly reconstruction.

1.8.4 Storm patrolling culverts with shovel and pick should occur by all crew/NR employees during significant storms. Damage will be reported and mapped for appropriate measures to be identified and implemented.

1.9: Quarry Management

1.9.1 Quarry drainage: At the completion of annual operations, quarry sites will be drained to minimize erosion, road drainage and deposition of sediment into watercourses. Spoils will be seeded, mulched and fertilized to revegetate them and keep dust to a minimum, especially where dust could reach streams. Locate spoils in low, or flat areas or utilize berms to prevent erosion.

1.9.2 Minimize sediment production from borrow pits and gravel sources through proper location, development and reclamation. Unstable fills will be excavated to stable locations. Adjacent plantations, etc. will not be impacted beyond agreed-upon quarry boundaries.

1.9.3 Aggregates: Where rock is to be placed on roads for surface stabalization use of shale type rock should be given a low priority. Where the use of alternative rock type appears costly, the proposed source of the local rock should be examined to determine if the rock source contains asbestos. Asbestos-bearing rocks should not be used for road surfacing.

2: Road Maintenance

2.1: Maintenance / Reconstruction Plan

2.2: Road maintenance includes project maintenance and reconstruction plans, and seasonal maintenance (storm patrol and dust abatement). Maintenance plans shall be used for each permanent road to insure that required maintenance is performed in order to protect environmental resources, and provide adequate transportation to those using the road. Maintenance plans shall include, but not be limited to:

2.3: Maintain Culverts & Ditches

2.3.1 Clean culverts: open all blocked or partially blocked culvert inlets.

2.3.2 Clean ditches: Clear inlet and outlet ditches of all debris—after roadside brushing; after grading and rocking.

2.4: Reconstruct Culverts & Structures

2.4.1 Repair retaining structures such as head walls, cribbing, abutments, etc.

2.4.2 Remove faulty culverts that are not working because of poor installation and reset them properly.

2.4.3 Replace damaged culverts that are not working because of damage or collapse and replace with new ones. Install additional culverts where needed.

2.5: Maintain & Reconstruct Roadway

2.5.1 Grade surface: Eliminate ruts, built up shoulder, and in general, reshape the road to conform to the standards for the maintenance level and use of road.

2.5.2 Repair damage to fill slopes using adequate compaction and consideration for stability and slope steepness. outslope roads where feasible.

2.5.3 Remove slides and rock, while minimizing further slope undercutting and sidecast of material. Utilize designated disposal sites and erosion control. consult with IDT members for slides near streams, where significant portions of the slope is involved and/or where sediment delivery to streams is likely to impact water quality and fish habitat.

2.5.4 Add material where necessary to fill holes in the roadbed or to compensate for losses due to wear or erosion. Determine causes of erosion and mitigate.

2.5.5 Maintain dips to assure their performance. Install water bars where erosion is not controlled by designed dips.

2.6: Roadside Brush

2.6.1 Remove all vegetative matter within the roadway which impedes vehicle traffic or interferes with road maintenance operations.

2.6.2 Designate sites for disposal or burn bays, avoid mixing woody debris into fill materials of the road prism. Place debris, waste material in a location to avoid entry into streams.

2.7: Surface Blading

2.7.1 Surface. blading is keeping a native or aggregate roadbed in a condition to provide proper drainage. This includes maintaining the crown, inslope or outslope of surface, shoulder; drainage dips; turnouts; road intersections. Gravel and dirt roads require adequate drainage to remain serviceable. All permanent roads should maintain a minimum of 2 to 5 percent slope to prevent water saturation of the subgrade. All roads should be outsloped to reduce the need for culvert maintenance or repair.

2.7.2 Road grading precautions:

2.7.2.1 Grade road surfaces only as often as necessary to maintain a stable surface and to retain the original surface drainage. During logging operations, early signs of problems are standing water or tire ruts. Serious damage to road surfaces starts with excess water.

2.7.2.2 Avoid cutting the toe of slopes when grading road or pulling ditches.

2.7.2.3 Haul all excess material to safe disposal sites and stabilize sites to prevent erosion. Avoid locations where erosion will carry materials into a stream.

2.7.2.4 Spot blade only those areas needing surface repair by smoothing surface ruts and potholes. Avoid grading sections of road that don't need it. This would create a source of sediment from newly disturbed surface.

2.7.2.5 If grading produces excess material, feather it out or haul it away. Never sidecast material into streams. Do not leave a berm that channels water down the road unless it is routed into an effective vegetation filter.

2.8: Ditch Cleaning

2.8.1 All slough material or other debris which might obstruct water flow in roadside ditches shall be removed. Material removed from the ditch, if suitable, may be blended into existing native road surface or shoulder in conjunction with surface blading. Contaminated soils shall be removed, and hauled to a disposal site.

2.9: Slide and Slump Repair

2.9.1 Slide material, including soil, rock and vegetative matter which encroaches onto the roadway, shall be removed. The slope which generated the slide material shall be reshaped during the removal of the slide. Slide material deposited on the fillslope and below the roadway will not be removed unless needed for slope stability. Try not to disturb the road surface or base.

2.9.2 When filling slumps or washouts, material shall be removed from borrow pits or hauled in, placed in layers, and compacted in 6 to 12 inch lifts, by equipment designed to perform the work. Damaged aggregate base, aggregate surfacing, and pavement shall be repaired or replaced. The repaired slump area shall conform to the existing cross section, to maintain drainage and slope stability.

2.9.3 Drainage of water shall be designed to minimize wetting of unstable slopes, to minimize erosion.

3: Road Drainage

3.1: Drainage Structures

This work consists of maintaining drainage structures and related items such as inlet and outlet channels, riprap and drop inlets.

3.1.1 Drainage structures and related items shall be cleared of all foreign material which has been deposited above the flowline and all vegetative growth which interferes with the flow pattern. Material removed that cannot be incorporated into maintenance work shall be hauled to a designated disposal site.

3.1.2 If outlet or inlet riprap was installed by contractor as a construction item or existed prior to Purchaser's haul, it shall be maintained in good condition including the replacement of riprap if necessary to previous line or grade.

3.1.3 Rolling dips shall be installed on all permanent roads with rock surface to reduce and displace surface runoff rates. This is also to be included into the maintenance plan.

3.2: Waterbars

This work consists of installing or removing waterbars in the roadbed.

3.2.1 Waterbars shall be installed on roads designated on the Road Maintenance Plan in accordance with locations flagged on the ground. All excavated materials shall be used in the installation of the waterbar.

3.2.2 Waterbars shall be removed on roads designated on the RMP for a smooth travel way by blading materials into the adjacent depression. The fill material shall be compacted by the equipment performing the work.

3.2.3 Waterbars may be required to be installed between storms or seasons of use and then removed when hauling is resumed.

3.3: Roadway Drainage & Grading

Drainage from road surface: Vary road grades to reduce concentrated flow in road drainage ditches, culverts, and on fill slopes and road surfaces. Well-designed roads with changing road grades, adequate ditches, and crossdrain culverts are important for controlling drainage and ensuring water quality.

3.3.1 Provide adequate drainage from the surface of all permanent and temporary roads by using outsloped or crowned roads, drain dips, or insloped roads with ditches and crossdrains.

3.3.2 Space road drainage features so peak drainage flow on the road surface or in ditches will not exceed the capacity of the individual drainage facilities.

3.3.3 Outsloped roads provide a means of dispersing water in a low-energy flow from the road surface. Outsloped roads are appropriate when fill slopes are stable, drainage will not flow directly into stream channels and transportation safety considerations can be met. A smooth surface is the key to an effective outsloped road. Smoothing and outsloping should be kept current, so water can drain across without creating channels in the road surface.

3.3.4 For insloped roads, plan ditch gradients steep enough, generally greater than 2%, but less than 8%, to prevent sediment deposition and ditch erosion. Higher gradients may be suitable for more stable soils; use the lower gradient for less stable soils.

3.3.5 Properly constructed drain dips (rolling dips) can be an economical method of channeling surface flow off the road. Construct drain dips deep enough into the subgrade so that traffic will not obliterate them. A rolling drain dip is a portion of road sloped to carry water from the inside edge to the outside onto natural ground. The dip cross grade should be at least 1% greater than the road grade.

3.4: Roadway Drainage Design

3.4.1 Prevent downslope movement of sediment by using sediment catch basins, drop inlets, changes in road grade, or recessed cut slopes. Drop inlets installed at the head of a ditch relief culvert slow the flow of water, help settle-out sediment, and protect the culvert from plugging. Rock armored inlets prevent water from eroding and undercutting the culvert and flowing under the road. Never allow a ditch to drain into a stream. Drain road ditches into a vegetated area far enough from the stream that there is no chance of ditch sediment reaching the channel.

3.4.2 Ditch relief culverts prevent water from crossing the road and softening the road bed, and they should release water onto a stable area. Where possible, install ditch relief culverts on the natural slope, at the gradient of the original ground slope; otherwise armor outlets with rock or anchor downspouts to carry water safely across the fill slope. Insure proper slope of at least five inches in every ten feet. Culvert bedding material should be free of rock or debris that might puncture pipe or carry water around the culvert. Cover with soil, avoiding puncture from large rocks. Compact soil at least halfway up the side to prevent water from seeping around the culvert. Rule of thumb for covering culverts: minimum of one foot or one-third the culvert diameter, whichever is greater.

3.4.3 Skew ditch relief culverts 20 to 30 degrees toward the inflow from the ditch to improve inlet efficiency and enhance flow. Protect upstream end of crossdrain culverts from plugging. Culvert grade should be at least 2% more than ditch grade.

3.4.4 Provide energy dissipaters (rock piles, logs) where necessary at the downstream end of ditch relief culverts, water bars, dips and other structures to reduce the erosion energy of the emerging water.

3.4.5 Route road drainage through Riparian Protection Zone, filtration fields,. or other sediment settling structures. Install road drainage features (slash windrow) above stream crossings to route discharge into filtration zones before entering a stream.

3.5: Culverts & Associated Structures

3.5.1 Any permanent road crossing live or intermittent streams will require a permanent culvert or rocky ford of a size capable of handling the projected 50 year runoff. Generally the diameter of culverts will not be less than 18 inches. The optimum culvert size recommended 36 inches because they are most likely not to plug with debris and require less maintenance.

3.5.2 Permanent culverts should have the same alignment as the stream and should not restrict fish movement. Where this is not possible, down spouts and energy dissipation devices will be installed.

3.5.3 Culvert length should be no longer than required to accommodate the roadbed plus a 1⁄2:1 fill sideslope from the roadbed to the culvert bottom. Culvert should not discharge on fill slopes, without spill basins installed.

3.6: Stream Crossing Design

3.6.1 Design stream crossings for adequate passage of fish, minimum impact on water quality and to handle peak runoff and flood waters.

3.6.2 Cross streams at right angles to main channel if practical. Alignment is critical for the culvert to function properly. Culverts set at an angle to the channel can cause bank erosion. Skewed culverts can develop debris problems.

3.6.3 Adjust the road grade to reduce the concentration of water carried by drainage ditches to stream crossings.

3.6.4 Avoid unimproved stream crossings. When a culvert or bridge is not feasible, locate fords on a stable, rocky portion of the stream channel. Consider railroad flatcars for a low cost alternative to conventional bridges.

3.7: Installation of Stream Crossings

3.7.1 Minimize stream channel disturbances and related sediment problems during construction of road and installation of stream crossing structures.

3.7.2 Time construction activities to protect fisheries and water quality. Construction of stream crossings has the greatest potential to cause immediate sediment pollution. Complete the work as fast as possible during a time of year when the least damage can occur.

3.7.3 Remove stockpiled materials, that are not reclaimed into the construction of the project, from high water zones.

3.7.4 When culverts are used to cross small streams, install them to conform to the natural stream bed and slope on all perennial streams. Place culverts slightly below normal stream grade to avoid washout; water should drop slightly as it enters the culvert.-Do not alter stream channels upstream from culverts, unless necessary to protect fill or to prevent culvert blockage.

3.7.5 Before the culvert is placed, the culvert bed must be graded to the appropriate slope to conform with the natural stream bed. The bed shall be either rock-free soil or gravel. Bedding should provide an even distribution of support under the full length of the pipe.

3.7.6 The culvert foundation and trench walls must be free of logs, stumps, limbs or rocks that could damage the pipe or allow water seepage. Start the backfill over one end of the culvert, then cover the other end. Once the ends are secure by backfill, cover the center. Pour backfill material over the top of the pipe. This allows finer soil particles to flow around and under the culvert.

3.7.7 Compact the backfill material. Base and sidewall fill material should be composed of compacted finer soil particles. Tamping fill material after every lift of 8" to 12" inches to the top of the culvert reduces the risk of water seepage into the fill.

3.7.8 Use 1 foot minimum cover for culverts 18 to 36 inches in diameter, and a cover of one-third diameter for larger culverts.

3.7.9 Both inlet and outlet of culvert should be armored. Rocks, logs or grass seeding can be used for erosion protection. When a new culvert is opened to water watch for need of more armor materials.

3.7.10 Road approaches to the new crossing are the next phase. Layers of fill are pushed into place and compacted in layers to build up and maintain road grade. A final precaution against sediment entering streams, should be a windrow of slash constructed around the culvert outlet.

3.8: Stream Fords

3.8.1 Fords of live streams are typically composed of streambed gravels, fill, or concrete structures built in contact with the streambed so that vehicles can cross the channel. A stable, rocky portion of the channel should be used.

3.8.2 On small, poorly incised, ephemeral or intermittent streams a ford may be needed if there is insufficient channel depth to install a culvert. A rock lined rolling dip with a rock apron face may be a desirable alternative to permanent culverts on these small watercourses.

3.8.3 Fords on small streams shall be rock armored to prevent erosion of the road surface and fill during periods of runoff. The fill face on the downstream side of the fill shall be protected with rock armor.

3.8.4 No unimproved fords shall be constructed, if they consist of a stream channel that has been filled with a substantial quantity of soil and left unprotected by armor or surfacing. This type of ford is detrimental to water quality.

3.9: Bridges

3.9.1 Adequate engineering design is required for bridges used for vehicle traffic.

3.9.2 Installation shall minimize or eliminate the use of equipment in the stream. A low impact equipment crossing (ford) may be needed in the immediate vicinity of the crossing to prepare both abutments and approaches for placement of the bridge. Construction activities shall result in only minimal disturbance to, and no sidecasting into, the stream channel.

3.9.3 Permanent bridges may be secured to the banks by using pilings driven at least 10 feet into the natural ground, or by using a cast or precast concrete abutment that is pinned and grouted to the bedrock or is cabled to deadmen buried behind the abutment.

3.9.4 Temporary bridges may also need to be set on or secured to abutments such as logs or precast concrete slabs.

3.9.5 Each abutment shall be leveled and secured far enough into the bank so that slumping or bank failure will not occur. Abutments and piers shall be parallel to the stream channel and set back from the channel to prevent any narrowing of the streambed and banks.

3.9.6 The bridge crossing shall be at right angles to the channel, but does not have to be level lengthwise across the stream. The bridge shall have enough clearance beneath the structure to pass the design flood flow.

3.9.7 To avoid draining road surfaces directly into the stream, bridges should not be located at the bottom of an abrupt dip in the road grade. If the road climbs away from the crossing in one or both directions, the approaches should be flattened for at least 50 feet, with road surface runoff diverted into a vegetated buffer strip before teaching the bridge site or stream.

3.10: Erosion Control Measures

3.10.1 Where surface erosion would produce substantial amounts of sediment into running water, newly constructed fill slopes, or fills over 10 feet long or bare areas greater than contiguous 800 square feet shall be seeded and mulched at the completion of operations, especially in Riparian areas. Seeding shall incorporate wildlife biology and silviculture considerations.

3.10.2 Stabilize erodible, exposed soils by seeding, compacting, riprapping, benching, mulching or other suitable means prior to fall or spring runoff. Seed mixtures should reflect recommendations of forestry and wildlife biology.

3.10.3 Mitigate surface runoff from wet season use. Ditches, where they are needed, should drain to a sediment filter, especially before entering a stream zone.

3.10.4 Hay bale placement will be used to filter sediment and turbid runoff.

3.10.5 At the toe of potentially erodible fill slopes and particularly near stream zones, pile slash in a windrow parallel to the road to trap sediment. Slash filter windrows are effective at keeping sediment from entering stream channels. Windrows commonly measure 3 x 3 feet and consist of compacted slash installed along the base of the fill slope. Provide 15 feet wide breaks in windrows at firelines, ridges and/or 200 feet intervals for easier big game passage.

4: Road Construction & Reconstruction

4.1: Clearing and Grubbing Vegetation

4.1.1 Trees and other large vegetation should be felled and bucked. In addition to right-of-way clearing, hazardous or unsafe trees should also be felled.

4.1.2 Trees and shrubs should be left growing at the base of the proposed fillslope and the right-of-way should be kept to the minimum width necessary for the planned use of the road.

4.1.3 During grubbing of the surface, stumps should be removed from within the road prism and anywhere fill or sidecast material will be deposited. Mixing stumps and other vegetative debris into the road fill should always be avoided to prevent instability of the road base. Slash larger than 3 inches in diameter and 3 feet in length should be removed from the road prism and piled in slash filter windrows or burn bays.

4.2: Excavation, Grading and Compaction

4.2.1 Minimize the extent of cut and fills in road construction/reconstruction, which may require engineering of roads in critical areas.

4.2.2 During road construction replace or modify culverts to accommodate 50 year storm flows, design stream crossings to prevent directing stream flow onto the road surface, outslope low-gradient road sections, and remove outboard berms which encourage channeling of surface runoff.

4.2.3 Sloping of cutbanks shall not excessively devegetate or destabilize cutslopes, which would produce sediment. General suggested run to rise slope ratios:

Table D.4.2.3.1

Slope Material	Cut Slope Ratio
Rock	¼ : 1
Rock/soil mixed	½ : 1
Clay or silt loam	1 : 1
Fill slope, rock or mixed:	1 ½ : 1
Unstabilized soil:	3 : 1

4.2.4 Construction will use sidecasting methods on gentle terrain, cut and fill (with compaction) on moderate slopes, or employ full bench construction techniques on steep slopes and where the road is near stream channels.

Table D.4.2.4.1

Road Construction Type	Equipment combinations
Cut and Sidecast	Excavator or dozer; grader; water truck
Cut and Fill	Excavator and/or dozer; grader; water truck
Full bench (cut)	Excavator; dump truck; dozer; grader; water truck
Reconstruction	Excavator; dozer; loader; dump truck; grader

4.3: Sidecast Construction

4.3.1 Procedure: In sidecast construction, the dozer starts at the top of the proposed cutslope, excavating and sidecasting material until the desired road grade and width is obtained. Material is pushed or drifted in front of the blade to areas where fill is needed. Road fill is used to cover culverts, and build up flat or low areas along the alignment. Fill must support traffic, it needs to be spread and compacted as much as possible to develop sufficient strength.

4.3.2 Sidecasting construction methods are not suitable on steep or moderate slopes near stream channels where loose material could saturate during wet weather and slide downslope. During sidecast construction, it is critical to avoid letting sidecast or waste material enter streams or placing it where it could erode into a watercourse.

4.3.3 On moderately and steeply sloping lands, keep sidecast everywhere less than about three feet deep, measured perpendicular to the original ground surface. Within 400 feet of a watercourse, feather out the sidecast within 30 feet of the road edge. Roads built within a riparian zone, or roads constructed across moderate or steep slopes that extend downslope to a stream channel, shall not have sidecast more than 1 foot thick and sidecast is to be feathered out within 10 feet of the road.

4.3.4 Do not sidecast on ground slopes exceeding 55%, and do not develop sidecast slopes over 65%.

4.3.5 For more protective sidecast construction, use of a hydraulic excavator to pioneer the road bench shall cleanly remove slash, stumps and logs and place them at the base of the fillslope so they are not incorporated in the fill. After grubbing and clearing, the excavated mineral soil can be selectively placed and partially compacted by the equipment. Soil carefully placed using this method is more stable than pushed or sidecast material. 65% slope is the steepest that material can be placed without proper engineering.

4.4: Cut and Fill with Compaction

4.4.1 Application: On moderate and steep slopes, to improve the road's stability, using the excavator, the following construction methods apply: backcasting, multi-benching, and full benching with endhauling.

4.4.2 Multi-benching is a good way to develop a stable footing with a minimum of sidecasting. First, a bench is cut at the proposed base of the fill, about 30 feet below the elevation of the proposed road grade. It may be necessary to excavate and endhaul material from the first cut to prevent sidecast material downslope. Next, the operator moves slightly upslope to create another bench, compacting the spoil material onto the first bench downslope. After the second bench is completed, the process is repeated until the final road elevation is reached. The result is a fill keyed into the hill slope on small benches with little sidecast.

4.4.3 Single benching uses the same basic methods as multi-benching. After the first bench is cut, a dozer or excavator may be used to cut into the hillside above the bench to widen and raise the road bed. As the cutting progresses, the road bed is widened and layers of spoil material are added to the bench in lifts of 1 foot and compacted after each layer. Cutting, filling and compaction continues until the final grade and width is reached.

4.4.4 Back casting is a method of producing a full bench road with no endhauling. The soil must be medium to coarse grained and well drained, and the slopes cannot exceed 80%. It may not be a suitable technique on approaches to incised stream channels where emerging groundwater is common. The surface immediately in front of the excavator is cleared and grubbed, and organic debris is either sidecast or windrowed at the base of the proposed fillslope. Then, a deep full bench is cut in front of the excavator about 25 to 30 feet wide and 8 to 10 feet deep at the road center line. The earth materials from this cut are backcast and piled on the subgrade behind the excavator. Once the bench has been constructed, the piled subgrade material is leveled and graded by a dozer or the excavator, with little or no sidecasting. Because the roadbed materials are all excavated and placed with little compaction, they should be allowed to settle and drain before the surface is outsloped or final ditches and ditch relief culverts are installed. On steep slopes, the fill will have to be reinforced and subdrains added for springs or wet areas.

4.4.5 True compactors, such as roller type or vibratory compactors, should be used in critical areas where fill compaction is necessary to ensure that the road will not fail.

4.5: Full Bench Construction

4.5.1 Application: Typically involves excavation of the road bed using a hydraulic excavator. A bench is cut into the rock or soil equal to the width of the road. No material is sidecast and spoil is used to fill low areas or stream crossings along the road alignment. Excess material is hauled offsite to a stable storage location, while only a very minor amount is drifted or feathered over and compacted on the road bench. Full bench road construction is typically reserved for moderate or steep slopes, or where a road approaches or parallels a stream channel that could be impacted by sidecasting.

4.5.2 Unstable rock, including soft or highly fractured sedimentary rocks, or rock with layering dipping steeply into the road cut, may not be suitable for full bench cuts. These deep cuts can remove critical toe support and initiate upslope failure. Deep, soft clays, lake deposits and other earth materials with similar physical properties may also be unsuitable for tall cuts because of their susceptibility to rotational slump or landslide type failures. Road design shall avoid locating any road construction where slopes are steeper than 60% and the soil or rock is weak.

4.6: Construction on Wet Soils

4.6.1 Water emerging from road cutbanks can be controlled using a French drain or vertical drainage trench. The trench is excavated, lined on both sides and the bottom with a geotextile fabric, back filled with open graded, clean gravel and topped with fabric and soil. The fabric keeps fine soil materials from entering the trench and plugging the drain. The trench is then drained across the road prism in an outflow trench or subsurface drainage pipe.

4.6.2 Water emerging beneath the road bed can be controlled by installing a drainage blanket beneath the fill. This provides an easy path for the emerging water to flow out from under the road without saturating the road bed and overlying fill materials, thereby preventing rutting, rilling, muddy surface conditions or fill failures. In the field, a permeable geotextile blanket is laid down over the wet zone prior to road construction, and a gravel layer is backfilled over the top. This gravel blanket shall slope to the outside edge of the road and daylight near the base of the fill to ensure proper drainage. Another geotextile layer is then laid on top and native soils are spread and compacted over the top until the desired road bed level is attained.

4.7: Fill Material Placement, Construction, and Reconstruction

4.7.1 Boulders, along with other large blocks and slabs of rock, should be stockpiled for use as future use in rock fills. If such materials are used in common fills, they are best buried at the base of the fill. Special effort should be made to obtain satisfactory compaction of the intervening material.

4.7.2 Where rock fills are specified, the rock should possess a minimum diameter of 2 inches and be free of fines.

4.7.3 Where fills are to be placed on existing slopes greater than 25% a base key should be excavated into competent material at the toe of the slope. The depth and extent of keys should be determined using geophysical expertise. All base keys should be at least a blade width. The existing ground surface that will receive fill should be benched at regular intervals.

4.7.4 Fill compaction: When reconstruction of fills or landslides occurs during dry summer months, water may be required since the moisture content of the soil may be below optimum for reworking compaction. If work proceeds during the winter months, it may require time to dry any onsite clay soils that are used as fill since their moisture will be above optimum.

5: Road Closure and Rehabilitation

5.1: Rehabilitation Plan

5.1.1 Interdisciplinary team members and field personnel will identify previously constructed access roads, landings, wet areas, streambanks, and old skid roads in the planning area that have been damaged by previous activities or left to decay, and develop for these a rehabilitation plan to address watershed protection.

5.1.2 Watershed restoration/rehabilitation projects could include draining or ripping old skid trails, out-sloping roads, closing roads, replacing culverts, debris/slide stabilization and erosion control seeding and mulching.

5.1.3 Wet-season damage to roads can be mitigated by allowing access only for necessary management activities, by construction of removable barricades; by making provision in timber sales contract (or planting contract) for closing roads after operations are completed; or by surfacing roads so they may be used during wet seasons.

5.2: Road Closure and Rehabilitation

5.2.1 Local spur roads with only occasional or limited use, should be closed and rehabilitated as "inactive roads". Inactive roads are not being used for commercial hauling, but may provide seasonal or future access. The temporary closure of any road should require some or all of the following treatments following active use.

5.2.2 Clear ditches and culverts, crown, out-slope or in-slope the road surface with water bars to minimize erosion.

5.2.3 Access should be totally blocked by gates or barriers such as ditches, boulders, mounds of dirt and debris, or by removal of a section of roadbed.

5.2.4 Rehabilitate the disturbed area of the road by seeding to grasses and forbs favorable to wildlife and forestry.

5.2.5 Leave inactive roads in a condition that provides adequate drainage without requiring further maintenance, but check periodically for damage.

5.3: Abandoned Road Rehabilitation

Roads not needed for logging, forest management, or recreation should be abandoned as follows. Spur roads with high potential for failure should be treated as temporary and abandoned after harvesting with full erosion control measures undertaken.

5.3.1 Culverts and fill materials may be removed from drainages where necessary. The excavated soil may need to be layered and compacted on stable slopes not exceeding 20%. Excavated soils, and drainage slopes where fill has been removed, may be planted with trees and/or shrubs at closely-spaced intervals to provide root strength to soils, reduce rainfall impacts, disperse surface flows and impede rilling.

5.3.2 Roads should be ripped or tilled where necessary for successful planting. They should be water barred after ripping at intervals of no greater than 200 feet, so that water is not collected and conveyed long distances along ripped furrows, to discharge over the edge of the road.

5.3.3 Road and landing surfaces, and cut and fill slopes, could be planted with conifers where this is compatible with forest management plans. Planting and erosion control measures on unrocked roads should be completed immediately following abandonment.

5.3.4 Allow adequate drainage by out-sloping any remaining roadbed, pulling culverts that might become plugged, water barring at frequent intervals for cross drainage. Ditches should be constructed at seepage points to convey water across the road.

5.3.5 Landings should be drained with multiple water bars to avoid concentration of discharge of surface flows at a single location. Rip-rap, or anchored logs or stumps may be placed at discharge points to dissipate fluid energy.

5.3.6 Where natural slopes below landings exceed 70%, organic debris and soil placed over the edge should be pulled. Organic matter should be segregated and soil layer-placed and tractor compacted on slopes not exceeding 20%. Bare soil beneath landings as well as excavated, compacted soil should be planted with conifer seedlings.

6: Snag Management Protocols[5]

Save large-diameter snags, when available, that are a minimum of 20 feet tall (U.S. Forest Service 1985), in every 5-25 acre stand, adjacent to green trees, and in clusters if available (Bull et al. 1997). Retain snags on all slope aspects

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[5] Excerpted from Coeur d'Alene Reservation Forest Management Plan 2003-2017 Appendix 7.3.

and positions of the slope (Bull et al. 1997). Preferences should be given to the retention of the younger snag age classes (harder snags), although older and softer shags should not be excluded (Bull et al. 1997).

6.1: Snag Retention Densities

6.1.1 Warm, dry ponderosa pine, Douglas-fir (generally forests below 4000 ft on the Reservation, Habitat types 110–230, 320–370, slopes 0-60%)

1 to 2 snags per acre at least 20" dbh.

6.1.2 Grand fir, spruce, hemlock, subalpine fir, and cool Douglas fir (generally forests above 4000 feet and lower elevation north slopes on the Reservation, habitat types 250-319, 410-480, 505, 506, 510-560, 565-790)

Range of 6–12 snags, 20" dbh, per acre: ponderosa pine and western larch where available, Douglas fir as a second choice.

6.2: Green Leave Tree Densities to Ensure Snag Recruitment

Due to the need to provide a continuous supply of snags over time, and in light of the fact that snags of adequate diameters may not be produced in the future under normal rotations, there is a need to designate green trees as snag replacements. Non-merchantable and cull trees showing obvious signs of wildlife use such as nesting, feeding, or denning or trees with broken or dead tops or of poor form are most appropriate green leave tree candidates (U.S. Forest Service 1985). However, if these trees are not available merchantable trees may be left where it is deemed necessary to meet future cavity habitat needs. Green tree leave densities should be no less than 2 times the number of snags retained in alternating 5-25 acre blocks (Bull et al. 1997).

Appendix E

Terrestrial and Aquatic Species Lists

Wetland/Riparian Vegetation List Observed in the Hangman Creek Watershed

(Spokane County Conservation District 1994; Scaroni 1998).

Scientific Name	***Common Name***
Camassia quamash	Camas
Populus tricocarpa	Black Cottonwood
Salix lutea	Yellow Willow
Salix exigua spp. *exigua*	Coyote Willow
Salix exigua spp. *melanopsis* var. *tenerrima*	Coyote Willow
Prunus virginiana var. *melanocarpa*	Black Chokecherry
Phalaris arundinacea	Reed Canarygrass
Equisetum spp.	Horsetail
Clematis ligusticifolia	Western Clematis
Rosa nutkana var. *hispida*	Rose
Pinus ponderosa	Ponderosa Pine
Scirpus acutus	Hardstem Bullrush
Glyceria barcalis	Northern Mannagrass
Betula occidentalis var. *occidentalis*	Water Birch
Pseudotsuga menziesii var. *glauca*	Douglas Fir
Alnus incana var. *occidentalis*	Mountain Alder
Acer glabrum	Rocky Mountain Maple
Cornus sericea var. *occidentalis*	Red-osier Dogwood
Rhus trilobata	Skunkbush sumac
Crataegus douglasii var. *douglasii*	Hawthorn
Abies grandis	Grand Fir
Taxus brevifolia	Pacific Yew
Salix alba var. *calva*	Golden Willow
Tanacetum vulgare	Common Tansy
Symphoricarpos albus	Snowberry
Ribes spp.	Currant
Heracleum lanatum	Cow Parship
Typha latifolia	Cattail
Carex nebraskensis	Nebraska Sedge
Sparganium angustifolium	Bur-reed
Salix lasiandra var. *caudata*	Pacific Willow
Salix scouleriana	Scouler’s Willow

Wildlife Native to the Coeur d'Alene Reservation

(Groves, et al. 1997; Mock 1980; Stebbins 1985, Nussbaum et al. 1983, Hutto 1995 and data on file with the Coeur d'Alene Tribal Wildlife Office).

Common Name	***Scientific Name***	***Habitat***	***Forest Condition***
Native Amphibians			
Long-toed Salamander	*Ambystoma macrodactylum*	LF	(e,s,p,em,m,og) wf
Tiger Salamander	*Ambystoma tigrinum*	LRWFA	(e,s,p,em,m,og) wf
Coeur d'Alene Salamander	*Plethodon idahoensis*	RW	
Idaho Giant Salamander	*Dicamptodon aterrimus*	LRF	(em,m,og) wf
Tailed Frog	*Ascaphus truei*	RF	(em,m,og) wf
Western Toad	*Bufo boreas*	LRWF	(e,s,p) wf
Boreal Chorus Frog	*Pseudacris maculata*	WFA	(e,s,p,em,m,og) wf
Pacific Tree Frog	*Pseudacris regilla*	LRWF	(e,s,p,em,m,og) wf
Wood Frog	*Rana sylvatica*	LRWF	(e,s,p,em,m,og) wf
Columbia Spotted Frog	*Rana pretiosa*	LRWF	(e,s,p,em,m,og) wf
Introduced Amphibians			
Bull Frog	*Rana catesbeiana*	L	
Native Reptiles			
Short-horned Lizard	*Phrynosoma douglassii*	FA	(e,s,p,em,m,og)
Northern Alligator Lizard	*Elgaria coerulea*	FA	(e,s,p,em,m,og) df
Western Skink	*Eumeces skiltonianus*	RF	(e,s,p,em,m,og) df
Painted Turtle	*Chrysemys picta*	LRW	
Rubber Boa	*Charina bottae*	WF	(e,s,p,em,m,og) df
Racer	*Coluber constrictor*	WFA	(e,s)
Western Terrestrial Garter Snake	*Thamnophis elegans*	WA	
Common Garter Snake	*Thamnophis sirtalis*	WFA	(e,s,p,em,m,og) wf

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Common Name	***Scientific Name***	***Habitat***	***Forest Condition***
<u>Native Birds</u>			
Pied-billed Grebe	*Podilymbus podiceps*	LW	
Red-necked Grebe	*Podiceps grisegena*	LRW	
American Bittern	*Botaurus lentiginosus*	LRW	
Great Blue Heron	*Ardea herodias*	LRW	
Canadian Goose	*Branta canadensis*	LRWA	
Wood Duck	*Aix sponsa*	LRW	
Green-winged Teal	*Anas crecca*	LRW	
Mallard	*Anas platyrhynchos*	LRWA	
Northern Pintail	*Anas acuta*	LRWA	
Blue-winged Teal	*Anas discors*	LRW	
Cinnamon Teal	*Anas cyanoptera*	LRW	
Northern Shoveler	*Anas clypeata*	LRW	
Gadwall	*Anas stepera*	LRW	
American Wigeon	*Anas americana*	LW	
Redhead	*Aythya americana*	LRW	
Harlequin Duck	*Histrionicus histrionicus*	R	
Hooded Merganser	*Lophodytes cucullatus*	LRW	
Common Merganser	*Mergus merganser*	LRW	
Turkey Vulture	*Cathartes aura*	F	(e,s,p,em,m,og)
Osprey	*Pandion haliaetus*	W	
Northern Harrier	*Circus cyaneus*	WA	
Sharp-shinned Hawk	*Accipiter striatus*	F	(p,em,m,og)
Cooper’s Hawk	*Accipiter cooperii*	F	(m,og)
Northern Goshawk	*Accipiter gentilis*	WFA	(m,og)
Red-tailed Hawk	*Buteo jamaicensis*	FA	(e,s,p,em,m,og)
Swainson’s Hawk	*Buteo swainsoni*	FA	e,s
American Kestrel	*Falco sparverius*	WFA	e,s
Peregrine Falcon•	*Falco peregrinus*		
Prairie Falcon•	*Falco mexicanus*		
Spruce Grouse	*Dendragapus canadensis*	F	em,m,og
Blue Grouse	*Dendragapus obscurus*	F	em,m

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Common Name	*Scientific Name*	*Habitat*	*Forest Condition*
Ruffed Grouse	*Bonasa umbellus*	W	em,m
Sharp-tailed Grouse•	*Tympanuchus phasianellus*	WA	
Virginia Rail	*Rallus limicola*	W	
Sora	*Porzana carolina*	LRW	
American Coot	*Fulica americana*	W	
Sandhill Crane	*Grus canadensis*	LRWA	
Killdeer	*Charadrius vociferus*	LW	
Spotted Sandpiper	*Actitis macularia*	W	
Common Snipe	*Gallinago gallinago*	LRW	
Black Tern	*Chlidonias niger*	LRW	
Mourning Dove	*Zenaida macroura*	FA	e,s,p,em
Common Barn-owl	*Tyto alba*	A	
Western Screech Owl	*Otus kennicottii*	WF	e,s,p
Great Horned Owl	*Bubo virginianus*	WFA	e,s,p,em,m,og
Northern Pygmy-owl	*Glaucidium gnoma*	F	em,m,og
Barred Owl	*Strix varia*	WF	em,m,og
Great Grey Owl	*Strix nebulosa*	WFA	em,m,og
Long-eared Owl	*Asio otus*	WFA	e,s,p,em,m,og
Short-eared Owl	*Asio flammeus*	WA	
Northern Saw-whet Owl	Aegolius acadicus	WF	p,em,m,og
Common Nighthawk	*Chordeiles minor*	FA	e,s,p,em,m,og
Vaux's Swift	*Chaetura vauxi*	FW	em,m,og
Black-chinned Hummingbird	*Archilochus alexandri*	WF	e,s,p,em
Calliope Hummingbird	*Stellula calliope*	WF	s,p,em,m,og
Rufous Hummingbird	*Selasphorus rufus*	F	s,p,em,m,og
Belted Kingfisher	*Ceryle alcyon*	LRS	
Lewis' Woodpecker	*Melanerpes lewis*	WF	p,em,m,og
Red-naped Sapsucker	*Sphyrapicus nuchalis*	F	em,m,og
Downy Woodpecker	*Picoides pubescens*	WF	em,m,og
Hairy Woodpecker	*Picoides villosus*	WF	em,m,og

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Common Name	*Scientific Name*	*Habitat*	*Forest Condition*
White-headed Woodpecker	*Picoides albolarvatus*	F	m,og
Northern Flicker	*Colaptes auratus*	WF	m,og
Pileated Woodpecker	*Dryocopus pileatus*	F	m,og
Olive-sided Flycatcher	*Contopus borealis*	WF	m,og
Western wood-pewee	*Contopus sordidulus*	WF	m,og
Willow Flycatcher	*Empidonax traillii*	WF	e,s,p,em,m,og
Hammond's Flycatcher	*Empidonax hammondii*	F	m,og
Dusky Flycatcher	*Empidonax oberholseri*	WF	e,s,p,em
Cordilleran Flycatcher	*Empidonax occidentalis*	F	p,em,m,og
Say's Phobe	*Sayornis saya*	A	
Western Kingbird	*Tyrannus verticalis*	A	
Eastern Kingbird	*Tyrannus tyrannus*	WFA	e,s,p,em,m
Horned Lark	*Eremophila alpestris*	A	
Tree Swallow	*Tachycineta bicolor*	WA	
Violet-green Swallow	*Tachycineta thalassina*	WFA	p,em,m
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	W	
Bank Swallow	*Riparia riparia*	W	
Cliff Swallow	*Hirundo pyrrhonota*	W	
Barn Swallow	*Hirundo rustica*	WA	
Gray Jay	*Perisoreus canadensis*	WF	e,s,p,em,m,og
Steller's Jay	*Cyanocitta stelleri*	F	e,s,p,em,m,og
Black-billed Magpie	*Pica pica*	WFA	e,s
American Crow	*Corvus brachyrhynchos*	WA	
Common Raven	*Corvus corax*	FA	e,s,p,em,m,og
Black-capped Chickadee	*Parus atricapillus*	F	em,m,og
Mountain Chickadee	*Parus gambeli*	WF	p,em,m,og
Chestnut-backed Chickadee	*Parus rufescens*	F	m,og
Red-breasted Nuthatch	*Sitta canadensis*	WF	em,m,og
Brown Creeper	*Certhia americana*	WF	m,og
House Wren	*Troglodytes aedon*	FA	e,s,p,em
Winter Wren	*Troglodytes troglodytes*	F	m,og

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Common Name	***Scientific Name***	***Habitat***	***Forest Condition***
American Dipper	*Cinclus mexicanus*	WF	riparian deciduous
Golden-crowned Kinglet	*Regulus satrapa*	F	m,og
Ruby-crowned Kinglet	*Regulus calendula*	FA	em,m,og
Western Bluebird	*Sialia mexicana*	WA	riparian deciduous
Mountain Bluebird	*Sialia currucoides*	FA	e,s,p,em
Townsend's Solitaire	*Myadestes townsendi*	WF	p,em,m
Veery	*Catharus fuscescens*	W	
Swainson's Thrush	*Swainson's Thrush*	F	e,s,p,em
Hermit Thrush	*Catharus guttatus*	WF	m,og
American Robin	*Turdus migratorius*	WFA	e,s,p,em,m
Varied Thrush	*Ixoreus naevius*	F	m,og
Gray Catbird	*Dumetella carolinensis*	WF	riparian deciduous
Cedar Waxwing	*Bombycilla cedrorum*	WF	e,s,p,em
Plumbeus Vireo	*Vireo plumbeus*	F	e,s,p,em
Warbling Vireo	*Vireo gilvus*	F	riparian deciduous
Red-eyed Vireo	*Vireo olivaceus*	WF	riparian deciduous
Orange-crowned Warbler	*Vermivora celata*	WFA	e,s,p,em
Nashville Warbler	*Vermivora ruficapilla*	WF	e,s,p,em,m,og
Yellow Warbler	*Dendroica petechia*	WFA	riparian deciduous
Yellow-rumped Warbler	*Dendroica coronata*	FA	e,s,p,em
Townsend's Warbler	*Dendroica townsenddi*	F	em,m,og
American Redstart	*Setophaga ruticilla*	FA	riparian deciduous
Northern Waterthrush	*Seiurus noveboracensis*	WF	riparian deciduous
MacGillivray's Warbler	*Oporornis tolmiei*	WF	e,s,p,em
Common Yellowthroat	*Geothlypis trichas*	WF	riparian diciduous
Wilson's Warbler	*Wilsonia pusilla*	WF	p,em,m,og
Yellow -breasted Chat	*Icteria virens*	WFA	riparian deciduous
Western Tanager	*Piranga ludoviciana*	F	e,s,p,em,m,og
Black-headed Grosbeak	*Pheucticus melanocephalus*	WF	e,s,p,em
Lazuli Bunting	*Passerina amoena*	WF	e,s,p
Spotted Towhee	*Pipilo maculatus*	WF	e,s,p,em

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Common Name	*Scientific Name*	*Habitat*	*Forest Condition*
Chipping Sparrow	*Spizella passerina*	WFA	s,p,em
Lark Sparrow	*Chondestes grammacus*	A	
Savannah Sparrow	*Passerculus sandwichensis*	WA	
Grasshopper Sparrow	*Ammodramus savannarum*	A	
Fox Sparrow	*Passerella iliaca*	WF	e,s,p,em
Song Sparrow	*Melospiza melodia*	WF	riparian deciduous
Lincoln's sparrow	*Melospiza lincolnii*	WF	e,s,p
Dark-eyed Junco	*Junco hyemalis*	FA	e,s,p,em,m,og
Bobolink	*Dolichonyx oryzivorus*	WA	
Red-winged Blackbird	*Agelaius phoeniceus*	WA	
Western Meadowlark	*Sturnella neglecta*	A	
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	WA	
Brewer's Blackbird	*Euphagus cyanocephalus*	WA	
Brown-headed Cowbird	*Molothrus ater*	FA	e,s,p,em,m,og
Bullock's Oriole	*Icterus bullockii*	WFA	riparian deciduous
Cassin's Finch	*Carpodacus cassinii*	F	e,s,p,em,m,og
House Finch	*Carpodacus mexicanus*	FA	urban woodlands
Red Crossbill	*Loxia curvirostra*	F	e,s,p,em,m,og
Pine Siskin	*Carduelis pinus*	FA	e,s,p,em,m,og
American Goldfinch	*Carduelis tristis*	WFA	e,s,p,em
Evening Grosbeak	*Coccothraustes vespertinus*	F	e,s,p,em,m,og
Introduced Game Birds			
California Quail	*Callipepla gambelii*	FA	e,s,p,em
Ring-necked Pheasant	*Phasianus colchicus*	A	
Hungarian Partridge	*Perdix perdix*	A	
Bobwhite Quail	*Colinus virginianus*	FA	e,s,p,em
Wild Turkey	*Meleagris gallopavo*	FA	e,s,p,em

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Common Name	***Scientific Name***	***Habitat***	***Forest Condition***
<u>*Native Mammals*</u>			
Masked Shrew	*Sorex cinereus*	F	e,s,p,em,m,og
Vagrant Shrew	*Sorex vagrans*	WF	e,s,p,em,m,og
Dusky Shrew	*Sorex monticolus*	WF	e,s,p,em,m,og
Water Shrew	*Sorex palustris*	W	
Little Brown Myotis	*Myotis lucifugus*	F	m,og
Yuma Myotis	*Myotis yumanensis*	WF	e,s,p,em,m,og
Long-eared Myotis	*Myotis evotis*	WF	e,s,p,em,m,og
Long-legged Myotis	*Myotis volans*	F	em,m,og
Silver-haired Bat	*Lasionycteris noctevagans*	WF	em,m,og
Big Brown Bat	*Eptesicus fuscus*	F	em,m,og
Hoary Bat	*Lasiurus cinereus*	F	em,m,og
Townsend’s Big-eared Bat	*Plecotus townsendii*	F	e,s,p,em,m,og
American Pika	*Ochotona princeps*		talus/meadow
Mountain Cottontail	*Sylvilagus nuttallii*	WF	e,s
Snowshoe Hare	*Lepus americanus*	WF	p,em,m,og
Yellow Pine Chipmunk	*Tamias amoenus*	F	e,s,p,em,m
Red-tailed Chipmunk	*Tamias ruficaudus*	F	em,m,og
Yellow-bellied Marmot	*Marmota flaviventris*	talus/rock	
Columbia Ground Squirrel	*Spermophilus columbianus*	WF	e,s,p,em
Golden-mantled Ground Squirrel	*Spermophilus lateralis*	F	e,s,p,em
Red Squirrel	*Tamiasciurus hudsonicus*	WF	p,em,m,og
Northern Flying Squirrel	*Glaucomys sabrinus*	WF	em,m,og
Northern Pocket Gopher	*Thomomys talpoides*	WA	
American Beaver	*Castor canadensis*	RWF	e,s,p,em,m,og
Deer Mouse	*Peromyscus maniculatus*	WFA	e,s,p,em,m,og
Bushy-tailed Woodrat	*Neotoma cinerea*	F	em,m,og
Southern Red-backed Vole	*Clethrionomys gapperi*	F	em,m,og
Heather Vole	*Phenacomys intermedius*	F	e,s,p,em,m,og
Meadow Vole	*Microtus pennsylvanicus*	WA	

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Common Name	***Scientific Name***	***Habitat***	***Forest Condition***
Montane Vole	*Microtus montanus*	WA	
Long-tailed Vole	*Microtus longicaudus*	WF	e,s,p,em,m,og
Water Vole	*Microtus richardsoni*	WF	
Muskrat	*Ondatra zibethicus*	LRW	
Western Jumping Mouse	*Zapus princeps*	WF	e,s,p,em
Common Porcupine	*Erethizon dorsatum*	WF	p,em,m,og
Coyote	*Canis latrans*	F	e,s,p,em,m,og
Gray Wolf•	*Canis lupus*	F	e,s,p,em,m,og
Red fox	*Vulpes vulpes*	FA	e,s
Black Bear	*Ursus americanus*	F	e,s,p,em
Grizzly or Brown Bear•	*Ursus arctos*	F	e,s,p,em
Common Raccoon	*Procyon lotor*	W	
American Marten	*Martes americana*	F	em,m,og
Fisher	*Martes pennanti*	F	m,og
Ermine	*Mustela erminea*	WF	e,s,p,em,m,og
Long-tailed Weasel	*Mustela frenata*	WF	e,s,p,em,m,og
Mink	*Mustela vison*	WF	riparian
Wolverine•	*Gulo gulo*	F	e,s,p,em,m,og
American Badger	*Taxidea taxus*	FA	e,s
Western Spotted Skunk	*Spilogale gracilis*	A	
Striped Skunk	*Mephitis mephitis*	WFA	e,s,p,em
Northern River Otter	*Lutra canadensis*	LRW	
Mountain Lion	*Felis concolor*	F	e,s,p,em,m,og
Lynx•	*Lynx lynx*	WF	e,s,p,em,m,og
Bobcat	*Lynx rufus*	WF	e,s,p,em,m,og
Elk	*Cervus elaphus*	WF	e,s,p,em
Mule Deer	*Odocoileus hemionus*	FA	e,s,p,em
White-tailed Deer	*Odocoileus virginianus*	WFA	e,s,p,em
Moose	*Alces alces*	WF	e,s,p,em
Woodland Caribou•	*Rangifer tarandus*	FW	m,og
Bighorn Sheep•	*Ovis canadensis*	Cliff grasslands	

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Plant species associated with the various forest habitat types known to be present on the Reservation (Cooper, et al. 1991).

Common Name	***Scientific Name***
<u>*Tree Species:*</u>	
grand fir	*Abies grandis*
subalpine fir	*Abies lasiocarpa*
paper birch	*Betula papyrifera*
western larch	*Larix occidentalis*
Engelmann spruce	*Picea engelmannii*
white bark pine	*Pinus albicaulis*
lodgepole pine	*Pinus contorta*
western white pine	*Pinus monticola*
ponderosa pine	*Pinus ponderosa*
douglas-fir	*Pseudotsuga menziesii*
western redcedar	*Thuja plicata*
western hemlock	*Tsuga heterophylla*
mountain hemlock	*Tsuga mertensiana*
<u>*Shrub Species:*</u>	
Rocky Mountain maple	*Acer glabrum*
Sitka alder	*Alnus sinuata*
serviceberry	*Amelanchier alnifolia*
black hawthorn	*Crataegus douglasii*
ocean-spray	*Holodiscus discolor*
Labrador tea	*Ledum glandulosum*
Utah honeysuckle	*Lonicera utahensis*
fool’s huckleberry	*Menziesia ferruginea*
devil’s club	*Oplopanax horridum*
pachistima	*Pachistima myrsinites*
syringa	*Philadelphus lewisii*
ninebark	*Physocarpus malvaceus*
common chokecherry	*Prunus virginiana*
white rhododendron	*Rhododendron albiflorum*
prickly currant	*Ribes lacustre*
baldhip rose	*Rosa gymnocarpa*
Nootka rosa	*Rosa nutkana*
pearship rose	*Rosa woodsii*
western thimbleberry	*Rubus parviflorus*
Scouler willow	*Salix scouleriana*

Common Name	*Scientific Name*
white spiraea	*Spiraea betulifoia*
common snowberry	*Symphoricarpos albus*
Pacific yew	*Taxus brevifolia*
blue huckleberry	*Vaccinium globulare*
<u>*Dwarf Shrubs and Low Woody Plants:*</u>	
bearberry	*Arctostaphylos uva-ursi*
creeping Oregon grape	*Berberis repens*
western wintergreen	*Gaultheria humifusa*
twinflower	*Linnaea borealis*
red mountain-heather	*Phyllodoce empetriformis*
yerba buena	*Satureja douflasii*
dwarf hucklberry	*Vaccinium caespitosum*
dwarf bilberry	*Vaccinium myrtillus*
grouse whortleberry	*Vaccinium scoparium*
<u>*Ferns and Allied Taxa:*</u>	
maidenhair fern	*Adiantum pedatum*
ladyfern	*Athyrium filix-femina*
oak-fern	*Gymnocarpium dryopteris*
western swordfern	*Polystichum munitum*
bracken fern	*Pteridium aquilinum*
<u>*Graminoids:*</u>	
bluebunch wheatgrass	*Apropyron spicatum*
Columbia brome	*Bromus vulgaris*
bluejoint reedgrass	*Calamagrostis canadensis*
pinegrass	*Calamagrotis rubescens*
elk sedge	*Carex geyeri*
Ross sedge	*Carex rossii*
Idaho fescue	*Festuca idahoensis*
smooth woodrush	*Luzula hitchcockii*
<u>*Perennial Forbs:*</u>	
common yarrow	*Achillea millefolium*
baneberry	*Actaea rubra*
trail-plant	*Adenocaulon bicolor*
windflower	*Anemone piperi*
wild sarsaparilia	*Aralia nudicaulis*
bigleaf sandwort	*Arenaria macrophylla*
heartleaf arnica	*Arnica cordifolia*
mountain arnica	*Arnica latifolia*

wild ginger	*Asarum caudatum*
showy aster	*Aster conspicuus*
arrowleaf balsamroot	*Balsamorhiza sagittata*
prince's pine	*Chimaphila umbellata*
alpine circaea	*Circaea alpina*
queencup beadlily	*Clintonia uniflora*
western goldthread	*Coptis occidentalis*
bunchberry dogwood	*Cornus canadensis*
Hooker fairy-bell	*Disporum hookeri*
wartberry fairy-bell	*Disporum trachycarpum*
Jeffrey's shooting star	*Dodecatheon jeffreyi*
woods strawberry	*Fragaria vesca*
strawberry	*Fragaria virginiana*
northern bedstraw	*Galium triflorum*
rattlesnake-plantain	*Goodyera oblongifolia*
roundleaf alumroot	*Heuchera cylindrica*
Canby's licorice-root	*Ligusticum canbyi*
licorice-root	*Ligusticum verticillatum*
tall bluebells	*Mertensia paniculata*
Brewer's mitrewort	*Mitella breweri*
alpine mitrewort	*Mitella pentandra*
side-flowered mitrewort	*Mitella stauropetala*
mountain sweet-cicely	*Osmorhiza chilensis*
bracted lousewort	*Pedicularis bracteosa*
coiled-beak lousewort	*Pedicularis contorta*
leafy lousewort	*Pedicularis racemosa*
Jacob's ladder	*Polemonium pulcherrimum*
common pink wintergreen	*Pyrola asarifolia*
one-sided wintergreen	*Pyrola secunda*
arrowleaf groundsel	*Senecio triangularis*
false Solomon's seal	*Smilacina racemosa*
starry Solomon seal	*Smilacina stellata*
twisted-stalk	*Streptopus amplexifolius*
evergreen synthyris	*Synthyris platycarpa*
western meadowrue	*Thalictrum occidentale*
coolwort foamflower	*Tiarella tirfoliata*
false bugbane	*Trautvetteria caroliniesis*
white trillium	*Tillium ovatum*
Sitka valerian	*Valeriana sitchensis*
American false hellebore	*Veratrum viride*

hook violet	*Viola adunca*
pioneer violet	*Viola glabella*
round-leaved violet	*Viola orbiculata*
beargrass	*Xerophyllum tenax*

Tribal Culturally Important Species

(Coeur d'Alene Tribe archival information 1995 and Tribal Language Center 1999; updated by the Tribal Language Program 2011)

PLANTS (the context is plants used for foods, not construction or other uses)

Family	Latin name	Common name	Coeur d'Alene name
Usneaceae	*Alectoria jubata* L.	Black tree moss (lichen)	sech'echt, smalqn
Pinaceae	*Pinus ponderosa* Dougl.	Ponderosa pine, yellow pine	Not Available
	Pinus contorta Dougl.	Lodgepole pine, black pine	qoqo'lit'
	Pinus albicaulis Engelm.	White bark pine, silver pine	suwistch
Salicaceae	*Populus tremuloides* Michx.	Aspen, quaking aspen	dułdułp or darełdułdułp
	Populus trichocarpa T. & G.	Black cottonwood	mulsh
Portulacaceae	*Claytonia lanceolata* Pursh	Springbeauty, Indian potato	Not Available
	Lewisia rediviva Pursh	Bitterroot	sp'it'em
Berberidaceae	*Berberis repens* Lindl.	Oregon grape	sqweyu'
	Berberis aquifolium Pursh	Oregon grape	
Grossulariaceae	*Ribes* spp.	Gooseberry	hnt'it"me'lps
	Ribes spp.	Wild currant	sts'erus
Rosaceae	*Amelanchier alnifolia* Nutt.	Serviceberry	słaq
	Crataegus douglasii Lindl.	Black hawthorn, black hawberry	sqhu'nech
	Crataegus columbiana Howell	Red hawthorn, red hawberry	Not Available
	Frageria spp.	Strawberry	stsaqwm
	Prunus virginiana L.	Chokecherry	łaqhwłuqhw
	Prunus emarginata (Dougl.) Walp. var. *emarginata*	Bittercherry	pchłen
	Rosa spp.	Wild rose, roseberry, rose hips	skhwaayapa'qn (wild rose)

	Rubus parviflorus Nutt.	Thimbleberry	polpolqn
	Rubus leucodermis Dougl.	Black raspberry	mtsukw, tiłteł'lmkhw (blackberry vine)
	Rubus idaeus L.	Red raspberry	hnhalaatse'
Eleagnaceae	*Shepherdia canadensis* (L.) Nutt.	Soapberry, foam berry, Indian ice cream	sqhusm
Umbelliferae	*Heracleum lanatum* Michx.	Cow parsnip	qhoqhłp
	Lomatium cous (Wats.) Coult. & Rose	Cous	ka'us, piwye
	Lomatium spp.	Wild celery	Not Available
	Sium suave Walt.	Water-parsnip	Not Available
Cornaceae	*Cornus stolonifera* Michx.	Pacific dogwood	stichskhwelp
Ericaceae	*Arctostaphylos uva-ursi* (L.) Spreng.	Bearberry, kinnikinnick	(berry) ilch, (plant) alchałpalqw
	Vaccinium membranaceum Dougl.	Huckleberry	st'shastq
	Vaccinium spp.	Small blueberry	st'eq'łn
Gentianaceae	*Frasera montana* Mulford	White frasera, stink root	masms
Caprifoliaceae	*Sambucus* spp.	Elderberry	ts'ekukw, (elderberry bush) ts'akokwalqw
Compositae	*Balsamorhiza sagittata* (Pursh) Nutt.	Balsamroot	Not Available
Alismataceae	*Sagittaria latifolia* Willd.	Water potato, wapato	sqigwts
Lilliaceae	*Allium geyeri* Wats.	Wild onion	sisch
	Allium cernuum Roth	Wild onion	qwliw'lsh
	Camassia quamash (Pursh) Greene	Camas	etqhwe'(baked)
	Lilian columbianum Leichtlin	Edible blue camas	sqha'wlutqhwe' (raw)
	Fritillaria pudica (Pursh) Spreng. (*Lillium columbianum*)	Yellow bell	Not Available
Apiaceae	*Lomatium canbyi* (J.M. Coult. &Rose) J.M. Coult. & Rose	Prairie camas	p'ekhwp'ukhw

BIRDS

Order and Family	**Latin name**	**Common name**	**Coeur d'Alene name**
Gaviiformes: Gaviidae	*Gavia immer* (Brunnich)	Common loon	ch'eqhq'n
Ciconiiformes: Ardeidae	*Botaurus lentiginosus* (Rackett)	American bittern	Not Available

Anseriformes: Anatidae	*Olor columbianus* (Ord)	Whistling swan	qhewitqhawit (generic name for a white swan)
	Branta canadensis (Linnaeus)	Canada goose	s(ihnt
	Anas platyrhynochos platyrhynochos Linnaeus	Mallard	qhwatqhwat (generic name for duck)
	Anas acuta Linnaeus	Pintail	Same as above
	Anas carolinensis Gmelin	Green-winged teal	Same as above
	Anas discors discors Linnaeus	Blue-winged teal	Same as above
	Anas cyanoptera septentrionalium Snyder and Lumsden	Cinnamon teal	Same as above
	Mareca americana (Gmelin)	American widgeon	Same as above
	Spatula clypeata (Linnaeus)	Shoveler	Same as above
	Aix sponsa (Linnaeus)	Wood duck	Same as above
	Aythya americana (Eyton)	Redhead	Same as above
	Aythya collaris (Donovan)	Ring-necked duck	Same as above
	Aythya valisineria (Wilson)	Canvasback	Same as above
	Aythya affinis (Eyton)	Lesser scaup	Same as above
	Bucephala clanguala americana (Bonaparte)	Common goldeneye	Same as above
	Bucephala albeola (Linnaeus)	Bufflehead	Same as above
	Oxyura jamaicensis rubida (Wilson)	Ruddy duck	Same as above
Galliformes: Tetraonidae	*Dendragapus obscurus pallidus* Swarth	Blue grouse	sq'wedups
	Bonasa umbellus phaia Aldrich and Friedman	Ruffed grouse	stukwtukwminn
	Pedioecetes phasianellus columbianus (Ord)	Sharp-tailed grouse, prairie chicken	Same as above
Charadriiformes: Scolopacidae	*Capella gallinago delicata* (Ord)	Common snipe	sts'i'chshn
Columbiformes: Columbidae	*Zenaidura macroura marginella* (Woodhouse)	Mourning dove	'ih'ih
Passeriformes: Corvidae	*Pica pica hudsonia* (Sabine)	Black-billed magpie	'ał(wets'
	Corvus brachyrhynchos hesperis Ridgeway	Common crow	'ałqhaqhaqh

MAMMALS

Order and Family	Latin name	Common name	Coeur d'Alene name
Lagamorpha: Leporidae	*Sylvilagus nuttallii nuttallii*	Nuttall's cottontail	sqwitsmsh (generic name for rabbit)
	Lepus americanus pineus	Snowshoe hare	Same as above
	Lepus townsendii townsendii	White-tailed jack rabbit	Same as above
Rodentia: Sciuridae	*Spermophilus columbianus columbianus*	Columbian ground squirrel	sich'
	Neotamias genus	Chipmunk spp.	q'wts'wiye
	Marmota flaviventris avara	Yellow-bellied marmot	sch'i'm (generic name for marmot)
	Marmota caligata nivaria	Hoary marmot	Same as above
Rodentia: Castoridae	*Castor canadensis leucodontus* Kuhl	Beaver	hnmulshench
Rodentia: Cricetidae	*Ondatra zibethicus osoyoosensis*	Muskrat	chelekhw
Carnivora: Canidae	*Canis latrans lestes*	Coyote	smiyiw
	Canis lupus	Wolf	hnt''lane'
	Vulpes vulpes macroura	Red fox	sqhwe(wqhwe(w
Carnivora: Ursidae	*Ursus americanus cinnamomum*	Black bear	hnłamqe'
	Ursus arctos idahoensis	Grizzly bear, brown bear	smaqhi'ch'n
Carnivora: Mustelidae	*Lutra canadensis nexa*	River otter	ltku
Artiodactyla: Cervidae	*Cervus elaphus nelsoni*	Elk, wapiti	spiłts'e'
	Odocoileus hemionus hemionus	Mule deer	sts'lishshn
	Odocoileus virginianus ochrourus	White-tailed deer	wishu's
	Alces alces shirasi	Moose	qhasi'qs
	Rangifer tarandus montanus	Caribou	Not Available
Artiodactyla: Antilocapridae	*Antilocapra americana americana*	Pronghorn, antelope	st(in
	Oreamnos americanus missoulae	Mountain goat	skhwt'i'
	Ovis canadensis canadensis	Bighorn sheep, mountain sheep	qhwłqhwał
Artiodactyla: Bovidae	*Bison bison bison* (Linnaeus)	Bison, buffalo	q'wdq'wed

FISH

Family	**Latin name**	**Common name**	**Coeur d'Alene name**
Acipenseridae	*Acipenser transmontanus* Richardson	White sturgeon	hnqha'qha'mn
Salmonidae	*Prospium williamsoni* (Girard)	Mountain whitefish	mimnułt
	Oncorhyncus clarki lewisii Richardson	Westslope cutthroat trout	'ełtumish
	Oncorhyncus gairdneri Richardson	Steelhead salmon (Spokane river)	smłich (generic name for salmon)
	Salvelinus malma (Walbaum)	Bull trout	Not Available
	Oncorhynchus tshawytscha (Walbaum)	Chinook salmon (Hangman Creek)	smłich (generic name for salmon)
Cyprinidae	*Ptychocheilus oregonensis* (Richardson)	Northern squawfish	Not Available
Catostomidae	*Catostomus catostomus* (Forster)	Longnose sucker	ełshe'lecht (generic name for sucker)
	Catostomus macrocheilus (Girard)	Largescale sucker	Same as above
	Catostomus columbianus (Eigenmann and Eigenmann)	Bridgelip sucker	Same as above

Non-Native Terrestrial, Wetland and Aquatic Plant Species found in Kootenai and Benewah Counties

(Source: Montana Department of Agriculture 1998)

• Indicates noxious weed classification in Idaho

Common Name

absinth wormwood
alsike clover
annual bluegrass
annual sowthistle
asparagus
baby’s breath
ball mustard
birdseye pearlwort
birdsfoot trefoil
bittersweet nightshade
black bindweed
black medic
black mustard
bladder campion
blue scorpion grass
blueweed
buckhorn plantain
bulbous bluegrass
bull thistle
Canada bluegrass
• Canada thistle
caragana
catnip
chickweed
chicory
clustered bellflower
common bugloss
common burdock
common caraway

Common Name

common cornsalad
common groundsel
common hemp nettle
common lambsquarters
common mullein
common purslane
common sage
common salsify
common speedwell
common St. Johns wort
common tansy
common teasel
common velvetgrass
common vetch
corn buttercup
corn chamomile
corn cockle
corn speedwell
cornflower
costmary chrysanthemum
cowcockle
creeping bellflower
creeping bentgrass
creeping buttercup
cultivated flax
curly dock
cutleaf blackberry
cypress spurge
• dalmatian toadflax

damesrocket
dandelion
deptford pink
• diffuse knapweed
downy brome
dwarf mallow
eurasian watermilfoil
European mountain ash
everlasting peavine
feverfew
• field bindweed
field filago
field pennycress
field pepperweed
flixweed
fowl bluegrass
fragrant waterlily
germander speedwell
green foxtail
ground ivy
hairy chess
hairy nightshade
hairy vetch
hedge mustard
henbit
Himalayan balsam
hop clover
hybrid salsify
hyssopleaf tickseed
Indian mustard
interrupted apera
Italian ryegrass
Japanese brome
Japanese knotweed
Jerusalem oak goosefoot
Kentucky bluegrass
knawel
ladysthumb
large crabgrass
large hop clover
• leafy spurge
little starwort
low cudweed
mahaleb cherry
marshpepper smartweed
matrimonyvine
mayweed chamomile
meadow fowtail
• meadow hawkweed
Mediterranean barley
moth mullein
mouse ear cress
mouseear chickweed
nightflowering catchfly
• orange hawkweed
orchardgrass
pale smartweed
perennial honesty
perennial ryegrass
• perennial sowthistle
petty spurge
pineapple weed
prickly lettuce
prickly Russian thistle
• purple loosestrife
quackgrass
rabbitfoot clover
rabbitfoot polypogon
rattlesnake brome
red catchfly
red clover
red fescue

red sandspurry
red seeded dandelion
red sorrel
redstem filaree
reed canarygrass
ripgut brome
• rush skeletonweed
• Russian knapweed
Russian olive
ryebrome
salad burnet
scentless chamomile
• Scotch broom
• Scotch thistle
shepherd's purse
small bugloss
small hop clover
smallflower geranium
smooth crabgrass
smooth hawksbeard
soft brome
sparrow vetch
spearmint
spiny sowthistle
spotted cats ear
• spotted knapweed
spring whitlowgrass
sticky chickweed
sulfur cinquefoil
sweet cherry
sweetbriar rose
tall buttercup
tall fescue
tall oatgrass
Tall tumblemustard
thymeleaf sandwort
thymeleaf speedwell
timothy
tower mustard
true forget me not
umbrella spurry
ventenata
water speedwell
western salsify
white bryony
white campion
white clover
white horehound
white poplar
white sweetclover
white willow
wild mustard
wild proso millet
yellow chamomile
yellow rocket
• yellow starthistle
yellow sweetclover
• yellow toadflax
yellow-devil hawkweed

Appendix F

Contacts for Tribes with Completed IRMPs

IRMP IMPLEMENTED

Native Village of Afognak
Sharon Anderson, Tribal Resource Manager
P.O. Box 968
Kodiak, AK 99615
907-486-6357, 907-486-6529 fax
sharon@afognak.org

Chickaloon Village Traditional Council
Stephen C. Simmons, Tribal Forester
Kari Johns, Tribal Historian
Justice McPherson, GIS Technician
Chickaloon Village Forestry Department
P.O. Box 1105
Chickaloon, AK 99674
907-745-0707, 907-745-7154 fax
www.chickaloon.org

Chugachmiut – two tribes
(Nanwalek & Port Graham)
Charles Sink, Director, Enterprise and Trust Services
1840 South Bragaw Street, Suite 110
Anchorage, AK 99508
907-562-4155, 907-563-2891 fax
charlie@chugachmiut.org

Ninilchik Traditional Council
Darrel Williams, Resource Management/Enforcement Officer
P.O. Box 39070
Ninilchik, AK 99639
907-567-3815, 907-567-3816 fax
darrel@ninilchiktribe-nsn.gov

Stevens Village Council

Dewey Schwalenberg, Natural Resource Director
dschwalenberg@catg.org
Margaret Matthew, IRMP Leader/Writer/Editor
Dave Lacey, Dinyee Corporation General Manager
P.O. Box 74012
Stevens Village, AK 99774
907-478-7228, 907-478-7229 fax

Miami Tribe of Oklahoma

Julie Olds (Cultural Preservation Officer), Project Director
P.O. Box 1326
202 South Eight Tribes Trail
Miami, OK 74355
918-542-1445, 918-542-7260 fax
www.miamination.com

Osage Nation

Jann Rose, Natural Resource Specialist

627 Grandview

P.O. Box 1495
Pawhuska, OK 74056
918-287-5531, 918-287-5581 fax
jrose@osagetribe.org

Bad River Band

Ervin Soulier, Natural Resources Manager
Rae Ann Maday, Watershed Coordinator
Chief Blackbird Center
P.O. Box 39
Odanah, WI 54861
715-682-7123, 715-682-7118 fax
souliere@badriver.com
madayrae@badriver.com

Bois Forte Reservation

BIA Minnesota Agency Forester
522 Minnesota Avenue NW
Room 418, Federal Building

Bemidji, MN 56601
218-751-2011 ext. 406, 218-751-4367 fax
Corey Strong
Bois Forte Natural Resources Director
5344 Lakeshore Drive
P.O. Box 16
Nett Lake, MN 55772
218-757-3261 ext. 50, 218-757-3607 fax
cstrong@rangenet.com

Fond du Lac Band
Christine Berini
1720 Big Lake Road
Cloquet, MN 55720
218-878-8006, 218-879-4854 fax
chrisberini@fdlrez.com

Grand Portage Reservation
Tim Miller, Reservation Forester
Grand Portage Band
27 Store Road
P.O. Box 428
Grand Portage, MN 55605
218-475-2415 ext. 41, 218-475-2615 fax
tpmiller@boreal.org

Keweenaw Bay Indian Community
KBIC Natural Resources Department
HCR01 Box 120
L'Anse, MI 49946
906-524-5757, 906-524-5748 fax
Mike Donofrio, Natural Resources Director
mdonofri@up.net

Lac Courte Oreilles Band
Michael Isham, Jr., Division Chief
Conservation Department
13394 W. Trepania Road, Building 1
Hayward, WI 54843
715-634-0102, 715-634-0107 fax
micisham@yahoo.com

Brett McConnell, Environmental Specialist

Lac du Flambeau Band

Larry Wawronowicz, Deputy Administrator of Natural Resources
P.O. Box 67
Lac du Flambeau, WI 54538
715-588-4213, 715-588-3207 fax
dir253@aol.com

Mille Lacs Band

Don Wedll, Commissioner of Natural Resources

Red Cliff Band of Lake Superior Chippewas

Reggie Cadotte, IRMP Coordinator
88385 Pike Road, Highway 13
P.O. Box 529
Bayfield, WI 54814
715-779-3700 ext. 244, 715-779-3704 fax
rcadotte@redcliff-nsn.gov

Red Lake Band

Department of Natural Resources
Pam May, Public Information Officer
P.O. Box 279, 15761 High School Drive
Red Lake, MN 56671
218-679-3959 ext. 1314, 218-679-2830 fax
pmay@paulbunyan.net
Tom Castonguay, BIA Trust Forester
218-679-3959 ext. 1313

White Earth Reservation

Michael Swan, Natural Resource Department Director
41044 S. Ice Cracking Road
Ponsford, MN 56575
218-573-3007, 218-573-3009 fax
mikes@whiteearth.com

Colville Confederated Tribes

Natural Resources Director
P.O. Box 150

Nespelem, WA 99155
509-634-2324, 509-634-2356 fax
Myra Clark, IRMP Coordinator
509-634-2323
myra.clark@colvilletribes.com

Conf. Tribes of Coos, Lower Umpqua & Siuslaw – IRMP for a portion of the reservation

Laurie Voshell, Tribal Planner
541-888-7510, 541-888-0302 fax
lvoshell@ctclusi.org
Beth Tanner, Water Quality Technician
Howard Crombie, Natural Resources Department Director
Environmental Division
1245 Fulton Ave.
Coos Bay, OR 97420
541-888-1304, 541-888-2853 fax
btanner@ctclusi.org, hcrombie@ctclusi.org

Flathead Reservation

Janet Camel, Land Use Planning Director
P.O. Box 278
Pablo, MT 59855
406-675-2700 ext. 1256, 406-275-2804 fax
janetc@cskt.org

Port Gamble S'Klallam Tribe

Barrett Schmanska, Planning Director
31912 Little Boston Road NE
Kingston, WA 98346
360-297-2646

Shoalwater Bay Indian Tribe

Gary Burns, Environmental Program Director
P.O. Box 130
Tokeland, WA 98590
360-267-3101 ext. 26, 360-267-2504 fax
gburns@shoalwaterbay-ns.gov

Spokane Tribe

Donna R. Smith, Environmental Coordinator, IRMP Coordinator
BIA, Spokane Agency
P.O. Box 389
Wellpinit, WA 99040-0389
509-258-4561 ext. 52, 509-258-7542 fax

Confederated Tribes of Warm Springs

Robert Brunoe, Natural Resources General Manager
P.O. Box C
541-553-2001, 3362
Ray Rangila, Planning Administrator
541-553-3270, 541-553-1924 fax
rrangila@wstribes.org
www.warmsprings.com

Ewiiaapaayp Band of Kumeyaay

Willie Micklin, Executive Director & Chief Operating Officer
wmicklin@leaningrock.net
Michael Garcia, Environmental Director
michaelg@leaningrock.net
4054 Willows Road
P.O. Box 2250
Alpine, CA 91903-2250
619-445-6315, 619-445-9126 fax

Chippewa Cree Tribe

Joan Mitchell
RR1, Box 544
Box Elder, MT 59521
406-395-4064, 406-395-4412 fax
joanlynn@yahoo.com

Northern Cheyenne Tribe

Clara Caufield
P.O. Box 128
Lame Deer, MT 59043
406-477-6284 ext. 180, 406-477-6210 fax
claracaufield@hotmail.com

Iowa Tribe of Oklahoma

Joy Yoshioka, Environmental Coordinator
RR 1, Box 721
Perkins, OK 74059
405-547-5433, 405-547-1033 fax
jyoshioka@iowanation.org

Pueblo of Acoma

Gilbert Petuuche, Natural Resources/Environment Director
P.O. Box 309
Acoma, NM 87034
505-552-6604, 505-552-6600 fax

Pueblo of Jemez

Steve Blodgett, Director, Department of Resource Protection
P.O. Box 100
040 Trading Post Road
Jemez Pueblo, NM 87024
505-834-7696, 505-834-7331 fax
sblodgett@jemezpueblo.org

Jicarilla Apache Nation

Dale Osborn, Office of Community Development
Hawks Drive
P.O. Box 507
Dulce, NM 87528
505-759-4295, 505-759-3264 fax
tribalplanning@jicarillaonline.com

Pueblo of San Ildefonso

Myron J. Gonzales, Core Team Leader, Natural & Cultural Resource Coordinator
Route 5, Box 316-AB
Santa Fe, NM 87506
505-455-2273, 505-455-7351 fax
mgonzales@sanipueblo.org
Irene Tse-Pe, Tribal Administrator
itsepe@cnsp.com

Southern Ute Tribe

Tribal Forester
P.O. Box 737
Ignacio, CO 81137
970-563-4571, 970-563-9515 fax

Duckwater Shoshone Tribe

Maurice Frank-Churchill
511 Duckwater Falls Road
P.O. Box 140068
Duckwater, NV 89314
775-863-0227, 775-863-0301 fax
moe churchill@yahoo.com

Hopi Tribe

Micah Loma'omvaya, Archaeology/Ethnohistory Program Manager
Cultural Preservation Office
P.O. Box 123
Kykotsmovi, AZ 86039
928-734-3617, 928-734-3629 fax, 928-205-1315 cell
mlomaomvaya@hopi.nsn.us

Paiute Tribe of Utah-Koosharem Band

Gayle Rollo, Economic Development Director
440 North Paiute Drive
Cedar City, UT 84720-2613
435-586-1112 ext. 112, 435-867-2659 fax
paiutetrust@hotmail.com

Washoe Tribe of Nevada & California

Marie Barry, Environmental Program Director
919 Highway 395 South
Gardnerville, NV 89410
775-265-8682, 775-265-3211 fax
marie.barry@washoetribe.us

Birds in trees on the St. Joe River (photo by John Hartman).

Acronyms

ARPA	Archeological Resources Protection Act
ATSDR	Agency for Toxic Substances and Disease Registry
BA	Biological Assessment
BIA	Bureau of Indian Affairs
BIAM	Bureau of Indian Affairs Manual
BMP	Best Management Practices
BO	Biological Opinion
BP	Before Present
CAA	Clean Air Act
CAC	Citizen Advisory Committee
CDA	Coeur d'Alene
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CWA	Clean Water Act
DFC	Desired Future Conditions
DM	Departmental Manual
DOI	Department of Interior
DPEIS	Draft Programmatic Environmental Impact Statement
EAP	Environmental Action Plan
EHS	Environmental Health Specialist
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EXTOXNET	Extension Toxicology Network
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FPEIS	Final Programmatic Environmental Impact Statement
GIS	Geographic Information System

GUP	General Use Pesticides
HEL	Highly Erodible Soils
HUD	Housing and Urban Development
ICBEMP	Interior Columbia Basin Ecosystem Management Project
ICHHP	Intertribal Council on Hanford Health Projects
ID	Idaho
IDT	Interdisciplinary Team
IDWR	Idaho Department of Water Resources
IRIS	Integrated Risk Information System
IRMP	Integrated Resource Management Plan
ITEP	Institute for Tribal Environmental Professionals
KEC	Kootenai Electric Cooperative
LMA	Land Management Areas
LMR	Land Management Recommendations
LOD	Large Organic Debris
LUSTs	Leaking Underground Storage Tanks
MBF	1000 board feet (lumber measurement)
MMBF	1 million board feet
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PEIS	Programmatic Environmental Impact Statement
PM	Particulate Matter
ROD	Record Of Decision
RUP	Restricted Use Pesticides
SCS	Soil Conservation Service
TCPs	Traditional Cultural Properties
TES	Threatened and Endangered Species
TMDLs	Total Maximum Daily Loads
TPPC	Tribal Pesticide Program Council

TSS	Total Suspended Sediment
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USEPA	US Environmental Protection Agency
USFS	United States Forest Service
USFWS -	United States Fish and Wildlife Service
USTs	Underground Storage Tank
VOCs	Volatile Organic Compounds
WWP	Washington Water Power (now Avista Corporation)

A group of people, including Felix Aripa, walking on the Trail of the Coeur d'Alenes (photo by John Hartman).

GLOSSARY

Sources for this glossary include: Federal regulations; Forest Ecosystem Management: An Ecological, Economic, and Social Assessment; Upper Columbia River Basin DEIS; Region 4 Desk Guide; Resource Planning Act Program Glossary 1995; Pacfish and Infish EAs; USDA Forest Service and BLM Hydrologic Analysis; American Fisheries Society Glossary; Soil Hydrologic Reconnaissance Reports; Coeur d'Alene Tribe Environmental Action Plan; USFWS Bull Trout Recovery Plans; Webster's Dictionary; other Coeur d'Alene Tribal sources; and internet sources.

303(d) list	A list of stream segments for a given region that do not meet water quality standards. It is named for the section of the Clean Water Act requiring the list.
adfluvial fish	Fish that migrate between lake and river systems; such as land-locked kokanee salmon or some bull trout.
adverse effect	For the IRMP, "adverse effect" is used in the context of the Endangered Species Act relative to effects on Threatened, Endangered, Proposed, and Candidate (TEPC) species. Definitions are from the Final Endangered Species Consultation Handbook (U.S. Fish and Wildlife Service 1998a and b). They include both "likely to adversely effect" and "not likely to adversely effect". Both of these definitions are needed to clearly understand the intent of the phrase "adverse effect" when applied to Reservation wide and management area direction involving TEPC species. The definition of "take" is also included below to help clarify intent. • Is likely to adversely effect - the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial (see definition of "is not likely to adversely

effect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely effect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely effect" determination should be made. An "is likely to adversely effect" determination requires the initiation of formal Section 7 consultation.

- Is not likely to adversely effect - the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully detect, measure, or evaluate insignificant effects; or (2) expect discountable effects to occur.
- Take: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct [ESA §3(19)]. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (50 CFR § 17.3).

affect or affecting Will or may have an effect on.

air pollutant Any substance in air that could, if in high enough concentration, harm humans, animals, vegetation, or material. Air pollutants may include almost any natural or artificial matter capable of being airborne in the form of solid particles, liquid droplets, gases, or a combination of these.

air quality	The composition of air with respect to quantities of pollution therein; often used in connection with "standards" of maximum acceptable pollutant concentrations.
alternative	In an Environmental Impact Statement (EIS), one of a number of possible options for responding to the purpose and need for action.
amenity	Resource use, object, feature, quality, or experience that is pleasing to the mind or senses; typically refers to resources for which monetary values are not or cannot be readily established, such as scenery or wilderness.
anadromous fish	Fish that hatch and rear in fresh water, migrate to the ocean, mature there, and return to fresh water to reproduce (e.g. salmon and steelhead).
bankfull	The elevation on a stream bank where the stream begins to flow onto a flood plain.
beneficial impact	Beneficial effects are positive effects to resources, or to social or economic conditions. Specific to ESA species, beneficial effects are contemporaneous positive effects without any adverse effects to the species. The appropriate conclusion when effects on listed species are expected to be beneficial would be: "Is not likely to adversely effect".
beneficial use	Any of the various uses which may be made of a water body, including, but not limited to cultural use, agricultural water supply, industrial water supply, domestic water supply, primary contact recreational use, secondary contact recreational use salmonid spawning, overwintering, emergence, and rearing, cold water biota, and warm water biota.

Best Management Practices (BMPs)	Practices determined by Federal, Tribal, or State agencies to be the most effective and practical means of protecting resources by minimizing pollution, soil erosion, or habitat destruction.
big game	Large wild animals that are hunted for sport and food. Big game animals include deer, elk, and moose.
biological diversity (or biodiversity)	The variety of life. Biological diversity includes all living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
biota	The living things of an area, including plants and animals.
broadcast burning	Burning forest fuels as they are, with no piling or windrowing.
browse	Woody plant twigs, leaves, and shoots that animals eat.
composition (species)	The species that make up a plant or animal community, and their relative abundance.
Comprehensive Plan (Tribal)	The Tribal Comprehensive Plan is the blueprint for the implementation of Tribal policy and goals.
connectivity	The degree to which habitat shape and distribution allows organisms and natural processes to move across the landscape. High levels of connectivity can result from unbroken stretches of habitat or from hospitable travelways that connect habitat patches. Connectivity is the opposite of fragmentation. Sites in a landscape are "connected" if there are patterns or processes to link them in some way. These links arise either from static patterns (e.g., landforms, soil distributions, contiguous forest cover) or from dynamic processes (e.g., dispersal, fire). A particular landscape may have radically different degrees of connectivity with respect to different processes. Connectivity usually involves corridors and networks and describes how patches are connected in the landscape.
corridor (landscape)	Landscape portion that connects similar patches of habitat through an area with different habitat. For example, streamside vegetation through a landscape of row crop may create a corridor that connects forested areas.

cover	Referring to vegetation and debris used by animals to dwell and hide. It may also refer to the arrangement of vegetation, debris, logs, or rocks which occur on the ground.
critical habitat	Specific areas, within a geographical area occupied by a species of concern, and/or threatened or endangered species, on which are found physical or biological features essential to conservation of the species. These areas may require special management consideration or protection, and can also include specific areas outside the occupied area that are deemed essential for conservation.
cultural resources	Cultural resources are those resources important to the lifeways of past and present people. Many Schitsu'umsh cultural resources are still used today, bridging the gap between past and present lifeways and maintaining cultural integrity. Archaeological resources, a subset of cultural resources, include sites, structures, and artifacts used by past residents and travelers. Cultural resources on the Reservation, as within the entire aboriginal territory, are diverse and include properties such as archaeological sites; pictographs and petroglyphs; artifacts; burial sites, associated and unassociated funerary objects and cultural patrimony; other sacred sites; hunting, gathering, and fishing areas; and cultural activity areas.
culture	Culture "is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society." (Tylor 1871:1)
cumulative effects	Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Significant cumulative effects can result from individually minor actions taking place over a period of time.
degradation	To degrade, or the act of degrading. Refer to the definition of "degrade" in this glossary.

degrade	To degrade is to measurably change a resource condition for the worse within an identified scale and time frame.
demographic	Related to the vital statistics of human populations (size, density, growth, distribution, etc.).
denning habitat or sites	Habitat and locations used by mammals during reproduction and rearing of their young, when the young are highly dependent on adults for survival.
Desired Future Condition (DFC)	A portrayal of the land, resource, or social and economic conditions that are expected in 20–100 years if management goals and objectives are achieved. A vision of the intended long-term conditions of the land.
developed recreation	Recreation that requires facilities that in turn result in concentrated use of an area; for example, a campground or ski resort.
dispersed recreation	Recreation that does not occur in a developed recreation setting, such as hunting, scenic driving, or backpacking.
disturbance	Any event, such as wildfire or logging, that alters the structure, composition, or function of an ecosystem.
ecological function	The activity or role performed by an organism or element in relation to other organisms, elements, or to the environment.
ecological integrity	In general, ecological integrity refers to the degree to which the elements of biodiversity and the processes that link them together and sustain the ecosystems are complete and capable of performing desired functions.
ecological processes	The actions or events that link organisms (including humans) and their environment such as disturbance, successional development, nutrient cycling, productivity, and decay.
ecosystem	A naturally occurring, self-maintained system of living organisms and their environment.
effects	“Effects” and “Impacts” are synonymous. They include direct, which are caused by the action and occur at the same time and place, and indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect

	effects/impacts may include growth inducing effects/impacts and other effects/impacts related to induced changes in the pattern of land use, population density or growth rate, and related effects/impacts on air and water and other natural systems, including ecosystems. Effects/impacts include ecological (such as the effects/impacts on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects/impacts may also include those resulting from actions which may have both beneficial and detrimental effects/impacts, even if on balance the agency believes that the effect will be beneficial.
encroachments	Legal: Any dock, pier, float home, boat garage, jetty, float, piling, breakwater, boat ramp, channel, basin, landfill, fill, sea wall or other structure on, in or above the submerged lands or waters of the Coeur d'Alene Reservation. General: Increase or ingrowth of one land use or land cover upon another, such as increasing agricultural use of floodplains.
endangered species	An animal or plant species that has been given federal protection status because it is in danger of extinction throughout all or a significant portion of its natural range. Species are designated by the U.S. Fish and Wildlife Service or National Marine Fisheries Service,
Environmental Impact Statement (EIS)	This is a document required by Section 102 (2) (C) of the National Environmental Policy Act. It is a detailed report required by all agencies of the federal government when their proposals for legislation or other major Federal actions will significantly affect the quality of the human environment. It must include the environmental impact of the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, alternatives to the proposed action, the relationship between local short-term uses of man's

	environment and the maintenance and enhancement of long-term productivity, and, any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.
ephemeral stream	A stream or portion of a stream that in a normal year only has flow during, and shortly after, precipitation events. Ephemeral stream beds are located above seasonal water tables and groundwater is not a source of water for ephemeral streams. Unlike intermittent streams, ephemeral streams usually do not have well-defined stream channels or banks, and ephemeral stream channels are always above the water table.
exotic species	Animals or plants that have been introduced from a distant place and are non-native to the area of introduction.
facility	A structure needed to support the management, protection, and utilization of the Reservation including buildings, utility systems, roads, and other constructed features.
Fire Management Plans	A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program described in the approved Tribal Forest Plan.
fire regimes	The characteristics of fire in a given ecosystem, including factors such as frequency, intensity, severity, and patch size.
fire suppression	Efforts made to extinguish wildfires or limit their extent. Also, some landuse activities may result in unintentional fire suppression, such as fragmentation of forest habitat by agriculture.
fire use	The combination of wildland fire use and prescribed fire application to meet resource objectives.
fluvial (fish)	Fish that migrate, but only within a river system. For example, bull trout that migrate into larger river systems are fluvial.

forage	Plant materials (usually grasses, forbs, and shrubs) that are available for animal consumption.
forbs	Broadleaf ground vegetation with little or no woody material.
fragmentation	The splitting or isolation of habitat into smaller patches because of human actions. Habitat can be fragmented by activities such as timber harvest, road construction, and urbanization.
Geographic Information System (GIS)	A computer system that stores and uses spatial (mappable) data that can be used for map production, landcover analysis, etc.
geomorphic	Pertaining to forms found on the landscape, (e.g. hills, buttes, and river valleys are geomorphic features).
goal	As to IRMP management direction, a goal is a concise statement that helps describe a desired condition, or how to achieve that condition.
goods and services	The tangible and intangible values or products, expressed in market and non-market terms.
habitat	A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.
historic properties	Historic Properties are sites, structures, artifacts or general locations relevant to one or more significant elements of the past. These properties range from specific sites or entire landscapes and include all artifacts, records, and material remains related to such properties. Historic Properties include but are not limited to those properties included on or eligible for inclusion on the National Register as well as properties important to the Coeur d'Alene Tribe without consideration of National Register Criteria.
hydrologic	Pertaining to the properties, distribution, and effects of water. “Hydrology” is the study of water; including its occurrence, circulation, distribution, properties, and reactions with the environment.

Impacts	"Impacts" and "Effects" are synonymous. They Include direct, which are caused by the action and occur at the same time and place, and indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts/effects may include growth inducing impacts/effects and other impacts/effects related to induced changes in the pattern of land use, population density or growth rate, and related impacts/effects on air and water and other natural systems, including ecosystems. Impacts/effects include ecological (such as the impacts/effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts/effects may also include those resulting from actions which may have both beneficial and detrimental impacts/effects, even if on balance the agency believes that the effect will be beneficial.
indicator	In effects analysis, a device or a way for measuring effects from management alternatives on a particular resource or issue.
infrastructure	The facilities, utilities, and transportation systems needed to meet public and administrative needs.
intermittent stream	A stream or portion of a stream that flows during certain periods of the year, when groundwater provides the main water source. Runoff from rainfall may be a supplemental source of water for stream flow. In a normal year Intermittent streams dry up (generally in summer). Unlike ephemeral streams, intermittent streams usually have well-defined stream channels and banks, and channels may be below the seasonal water table.
key watershed	Evans, Alder, Benewah, Lake and Hangman Creeks.

k'wne' chstqhessiple' hnkhwlkhwlstsutnet (summarized as stqhesiple')	**"**The future course of our renewal" in the Coeur d'Alene language.
landslide	Any downslope mass movement of soil, rock, or debris.
large woody debris	Pieces of woody material having a diameter of at least three inches and a length greater than six feet (also referred to as coarse woody debris, or CWD).
littoral zone	The shallow near-shore zone of lakes that serves as the interface between the land and open water and is dominated by rooted emergent, floating and submersed vascular plants, and their attached flora and fauna.
maintain	This term has different technical meanings for various resource topics: For biological and physical resources, "maintain" means to produce no change in the existing conditions of a resource relative to their condition status; i.e. properly functioning, functioning at risk, or not functioning properly. Conditions that are "maintained" are neither restored or degraded, but remain essentially the same. The term "maintain" can apply to any condition or condition indicator at any scale of size or time, but those scales need to be identified. Specific to the Endangered Species Act, this term is appropriate for actions that have insignificant or discountable effects to existing resource conditions, whether they are in a degraded or properly functioning condition. When conditions are "maintained", the appropriate effects determination would either be "No effect" or "Is not likely to adversely effect". If insignificant or discountable effects are expected, the appropriate determination would be: "Is not likely to adversely effect". For land uses, "maintain" means to continue a current or existing practice, activity, management strategy, resource condition, or level of use.

	For resource inventories, databases, plans, maps, or other doc-uments related to all resources, “maintain” means to periodically update these items to reflect current conditions and/or status.
management action	Any activity that impacts lands, waters or resources.
management area	A land area with similar management goals and a common prescription, as described in the IRMP.
measurable benefits	A measurable benefit is one that can be meaningfully detected or documented using accepted analysis or monitoring methods.
mesic	Moderate moisture conditions. This can refer to a habitat characterized by, or a species adapted to moderate moisture conditions rather than wet (hydric) or dry (xeric) conditions.
mitigate	To avoid, minimize, reduce, eliminate, rectify, or compensate for impacts or degradation that might otherwise result from managament actions.
mitigation measures	Modifications of actions that: (1) avoid impacts by not taking a certain action or parts of an action in a given area of concern; (2) minimize impacts by limiting the degree or magnitude of the action and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for impacts by replacing or providing substitute resources or environments.
monitoring	The process of collecting information to evaluate if objectives and anticipated results of a management plan are being reached, or if implementation is proceeding as planned.
National Register of Historic Places (National Register, NRHP)	A national list of cultural resources deemed worthy of preservation, including buildings and objects that are significant in American history, architecture, archeology, engineering, and culture. The list was authorized under the National Historic Preservation Act of 1966.

native species	Animals or plants that originated in the area in which they live. Species that normally live and thrive in a particular ecosystem.
no action (alternative)	The most likely condition expected to exist if current management practices continue unchanged or if no new action is undertaken. The analysis of this alternative is required for federal actions under NEPA.
noxious weed	A plant species that causes negative ecological and economic impacts to native habitats, agricultural and other lands.
old growth	Old growth is a set of forested vegetation that reflect late-successional conditions, including stand structure, stand size, species composition, snags, downed logs, and decadence. Minimum amounts of large trees, large snags, and coarse wood are typically required to meet old growth definitions. Old growth definitions generally vary by forest type. Also, across a given forest type's geographical range, considerable variability can exist for specific ecological attributes that characterize old growth conditions.
opening (created)	Related to vegetation management, openings are created only by planned, even-aged, regeneration timber harvesting. Only those even-aged timber harvest practices that reduce stocking levels to less than 10 percent create openings. Canopy closure will normally be used to determine stocking levels. Residual stands of mature trees will generally have less than 10 percent stocking when fewer than 10 to 15 trees per acre remain following harvest. Even-aged harvest practices that may result in the creation of openings include clear-cutting, reserve tree clear-cutting, seed tree cutting, shelterwood seed cutting, and overstory removal.
patch	An area on the landscape consisting of a single habitat type that is surrounded by a different habitat type. For example, a pasture surrounded by forest would constitute a habitat patch of pasture.

Pelagic zone	The deep, open water zone of lakes.
perennial stream	A stream that typically maintains year-round surface flow, except possibly during extreme periods of drought. A perennial stream receives its water from springs or other permanent sources, and the water table often stands at a higher level than the floor of the stream.
phenotype	The outward, physical manifestation of the organism.
population	The people, wildlife, fish, or plants that inhabit and reproduce in a specific area. Also, a group of individuals of the same species occupying a defined locality during a given time that exhibit reproductive continuity from generation to generation.
prescribed fire	Any fire ignited intentionally to meet specific management objectives.
priority watershed	A watershed or drainage system deemed strategically important for specific or overall cultural or natural resource preservation.
proposed action	A proposal made by the Tribe or other agency to authorize, recommend, or implement an action to meet a specific purpose and need.
public road	Any road or street under the jurisdiction of, and maintained by, a public authority and open to public travel [23 U.S.C. 101(a)].
rear	To feed and grow in a natural or artificial environment.
reclamation	Actions that restore natural or naturally functioning conditions following disturbance or destruction of habitat or organisms. Reclamation can include removing facilities, equipment, and materials; recontouring disturbed areas towards original topography; neutralizing or removing toxic materials; salvage and replacement of topsoil; and revegetation.
resident fish	Fish that are non-migratory and spend their entire life cycle within a given freshwater area.
restoration	Management actions or decisions taken to recreate the desired conditions of habitats, natural communities, ecosystems, resources, or watersheds. Restoration may be

	active, or may involve passive approaches, wherein natural processes are expected to accomplish restoration objectives.
restore	For biological and physical resources, restore means to repair, re-establish, or recover ecosystem functions, processes, or components so that they are moving toward or within their range of desired conditions.
riparian areas or zones	Terrestrial areas where the vegetation and climate conditions are strongly impacted by streams or rivers; transition zones between aquatic habitats and upland habitats. Riparian areas tend to have soils and hydrology that differ from nearby non-riparian areas.
road	A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail.
roadless area	A large area of land that is unbroken by roads. The minimum area size may be designated by an agency.
rural	Areas where human populations are less dense and economies often include agriculture or resource utilization. When not farmed, vegetative cover is often natural and untended. Natural landscapes or landforms tend to dominate views. Specific definitions of rural may include human population densities, or proximity to urban areas.
scale	Geographic extent; for example, watershed, regional, sub-regional, sub-watershed, or landscape scale.
scoping	The process used to determine, through public involvement, the range of issues that the IRMP and other NEPA planning processes should address.
sedimentation	The action or process of depositing sediments. Stream sedimentation occurs when water velocity cannot transport the bed load and suspended matter is deposited by gravity along the streambed.
Shannon-Weiner Index	A computation performed upon plant or animal population numbers to determine and compare species diversity between two or more sites.

silt loam	A texture of soil defined by the percentage of sand, silt, and clay. Silt loam soils are generally considered to be favorable for plant growth and agriculture. Eleven other soil textures (such as clay loams and sandy clays) are recognized by the NRCS.
silviculture	The care and tending of stands of trees to meet specific objectives.
snag	A standing dead tree.
soil erosion	Soil erosion is the detachment and transport of soil particles or aggregates by wind, water, or gravity. Management practices may increase soil erosion when they remove ground cover and detach soil particles.
soil productivity	Soil productivity includes the inherent capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of plant volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation.
spawning	The act of fish reproduction. The mixing of the sperm of a male fish and the eggs of a female fish.
strongholds	For fish, strongholds are watersheds that: (1) include all major life-history forms (resident, fluvial, adfluvial) that historically occurred there; (2) have numbers that are stable or increasing, with local populations at least half of their historical size; and (3) have populations with at least 5,000 individuals or 500 adults.
structure	The size and arrangement, both vertically and horizontally, of vegetation.
subbasin	A drainage basin (river basin) that forms one branch of a larger drainage basin network.
subsistence	Subsistence generally is the means of living; obtaining food and shelter necessary to support life; everything that is done to make a living. Tribal subsistence practices include root and berry gathering, fishing and hunting, as well as participation in the cash economy.

substrate	The composition of a streambed, including mineral and organic materials.
subwatershed	A watershed that forms a portion of the area of a larger watershed.
succession	The replacement of one plant community by another.
suitability	The degree to which an activity or land condition goal is compatible with realities of the natural environment, the economy, and cultural values.
sustainable	Things that are done today will not jeopardize the health and well-being of future generations.
temporary road	Roads established for a single project that are expected to be unused and decommissioned after the project is finished (e.g. logging operation).
Threatened species	A plant or animal species given federal protection because it is likely to become endangered throughout all or a specific portion of its range within the foreseeable future. It is designated under the Endangered Species Act by the U.S. Fish and Wildlife Service or National Marine Fisheries Service.
Total Maximum Daily Load (TMDL)	The maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. The TMDL determination takes into account point source pollutants, non-point source pollutants, usages of the waterbody, and seasonal variation in water quality.
trail	A pathway for purposes of travel by foot, bicycle, stock, ski, snowshoe, or trail vehicles.
travel corridor	A Landscape portion that connects similar patches of habitat through an area with different habitat and over which or through which animal migration or relocation are possible. For an area to serve as a travel corridor, it must contain some degree of favorable cover, food, or location.
Tribal culture	Tribal culture is the knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by members of the Tribe. This includes the locations, products, and remains [i.e. artifacts and human remains]

	of this culture. Spiritual locations are also well defined in the mind of the Tribe.
Tribal waters	As used in the IRMP PEIS, the reference to "Tribal waters" denotes all waters subject to regulation under Tribal Code Chapters 43 (Boating) and 44 (Encroachments) as described in Idaho v. United States, 112 S.Ct. 2135 (2001), and includes a subset of those waters for which EPA has approved the Tribe to administer Clean Water Act (CWA) Sections 303(c) (water quality standards) and 401 (discharge certifications), as described in the Agency's decision document of August 5, 2005.
unstable areas	Land areas that have a higher probability of erosion, landslides, and channel adjustment disturbances during climatic or physical events such as major storms or fires.
urban	Areas where human population densities are higher and economies may include a sizable portion of income derived from jobs that are not agriculture or resource extraction based. Vegetative cover is often exotic and manicured. Buildings and human activity tend to dominate sights and sounds. Specific definitions of urban may include human population or building densities.
utility corridor	A linear strip of land defined for the present or future location of utility facilities within its boundaries.
viable population	A population that is regarded as having the numbers and distribution of reproductive individuals to ensure that it will continue to exist over time and will be well distributed within a given area.
watershed	Region or area drained by a specific river, stream, or other surface channel. A smaller watershed can be wholly contained within a larger one, as watersheds are hierachal in structure.
wetlands	Land areas that are wet at least for part of the year and are characterized by hydrophytic vegetation and hydric soils. Examples of wetlands include swamps, marshes, and some floodplain forests.

Wilderness Areas	Areas without developed and maintained roads, that are substantially natural. Congress has designated these areas as part of the National Wilderness Preservation System.
wildfire	An unplanned or unwanted wildland fire.
wildland fire	Any fire that is not a desired prescribed fire and is primarily fueled by wild or semi-wild vegetation on the landscape.
wildland urban interface	The line, area, or zone where structures and other human developments meet or intermingle with wildland or vegetative fuel.
winter range	An area or areas where animals (usually ungulates such as elk, deer, bighorn sheep) congregate and feed in winter due to favorable conditions. Conditions are often influenced by snow depth, temperature, and the availability of forage and cover.
xeric	A habitat characterized by dry conditions, or a species adapted to dry conditions.

Rose Creek Drum at Earth Day Coeur d'Alene Tree Planting Ceremony 2007 (photo by Earth Day Coeur d'Alene, Inc.).

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