US Army Corps of Engineers®
Walla Walla District

AHSAHKA STEWARDSHIP PROJECT

Dworshak Dam and Reservoir

Ahsahka, Idaho

ENVIRONMENTAL ASSESSMENT

January 2013

DRAFT

Finding of No Significant Impact

Ahsahka Stewardship Project
Dworshak Dam and Reservoir
Ahsahka, Idaho

The U.S. Army Corps of Engineers, Walla Walla District (Corps), proposes to restore the vegetative composition, form, and structure of selected forestland at Dworshak Reservoir (Dworshak), Clearwater County, Idaho to a desired condition consistent with historic, natural ecosystem processes. Selective harvest thinning (1,227 acres) and prescribed burning (937 acres) would be conducted on approximately 1,738 acres near Dworshak Dam. The proposed Ahsahka Stewardship Project is located near Dworshak Dam between river miles 0 and 4 on selected Corps-administered forestlands situated in Sections 23, 25, 26, 27, 34, 35, and 36 of Township 37 North, Range 01 East and in Sections 2 and 3 of Township 36 North Range 01East in Clearwater County, Idaho. A site location map is included in Appendix A, plate 1.

The purpose of this project is to restore the vegetative composition, form, and structure to a desired condition consistent with historic, natural ecosystem processes (wildfire) within the Ahsahka Project area.

The selected alternative (Alternative E, Harvest Using Multiple Yarding Methods and Prescribed Fire) uses selective removal of shade-tolerant tree species and overstocked early seral (early stages of successional vegetation development) tree species in conjunction with the use of controlled, low-intensity prescribed burns to emulate natural wildfire effects and bring about a future desired condition based on ecosystem principles. This action is necessary to restore native habitats to more appropriate conditions given the historical fire regime. Foreseen benefits include enhanced wildlife habitat, reduced fuel loading, and the creation of seedbeds for the regeneration of diminishing seral tree species.

Trees would be sold and removed by means of a Government contract timber sale. One or several Government contracts would be awarded soon after National Environmental Policy Act (NEPA) compliance is complete and would likely conclude late in 2016. Helicopters, line skidders, and tractors would be used to yard logs (transport

logs) to landings. Approximately six miles of previously constructed logging roads would be refurbished for use during performance of the work and five miles of existing roads would receive minor maintenance. Approximately four miles of new road would be constructed.

Harvest treatment would occur only in areas observed as having above expected canopy closure for those habitat types. To reestablish the natural vegetative form and structure, these areas would be thinned to 40 - 80 square feet of basal area per acre, leaving dominant and co-dominant trees. To reestablish the natural vegetative composition, the selection of individual trees for removal would incorporate the observed need to perpetuate native old-growth ponderosa pine (*Pinus ponderosa*) habitats and restore the early seral component within Douglas fir (*Pseudotsuga menziesii*) and mixed conifer stands. Thus, within Douglas fir and mixed conifer stands, harvest would promote the occurrence of native seral species, western larch (*Larix occidentalis*) and ponderosa pine. The overall net change in canopy cover within treated areas would be approximately 50 percent.

Tractors, helicopters, and line skidding machines would be used to carry logs to landings in preparation for truck transport to mills. Logging on steep slopes exceeding 40 percent would use helicopters and line skidding machines to carry logs (yarding) to landings. Approximately 73 acres would be tractor yarded, 131 acres helicopter yarded, and 1,022 acres yarded using line skidding.

Prescribed burning would be instituted where possible to emulate the natural effects of wildfire, approximately 937 acres are proposed. Within broadcast burn units, firebreaks would be constructed and logging slash would be left in the units. Firebreaks designed to prevent the spread of fire to outlying areas would be reseeded to native grasses following restoration activities. Logging slash (limbs, branches, etc.) would be lopped and scattered within the burn units to facilitate broadcast burning. Where broadcast burning is not possible (i.e. safety and/or containment) logging slash will be minimized by whole tree yarding to the landing sites. Debris piles will be burned at the landing sites. All burning would be executed in accordance with developed burn plans. Once initial prescribed burns are executed and fuel loads are reduced, the stewardship project area would be monitored to evaluate changes in vegetation, wildlife use, and fuels.

Riparian habitat conservation areas would be maintained around all water sources to help maintain the integrity of aquatic ecosystems. The Inland Native Fish Strategy (INFISH) (U.S. Department of Agriculture 1995) criteria would be used as a guide when establishing buffers for activities in riparian areas. A no disturbance zone, with a radius of 150 feet, would be maintained around all raptor nests from March 1 to August 30. One bald eagle nest that exists in the area will have a larger no-disturbance zone based on recommendations from the United States Fish and Wildlife Service (USFWS). If tree removal is desired within this no disturbance zone, the removal would be conducted between October 1 and February 28. In addition, neither the nest tree(s), nor any other trees within 50 feet of the nest tree, would be removed. Snags would be left unless they present a hazard to logging or prescribed burning activities. A Corps wildlife biologist would survey the timber sale area prior to harvest activity to locate any active raptor nests within the units.

The underlying purpose for restoring the vegetative composition, form, and structure was further defined into project objectives:

- reduce the risk of stand-replacing wildfire;
- increase the proportion, average size, and vigor of early seral tree species (ponderosa pine, Douglas fir, and western larch);
- increase the recruitment of ponderosa pine and western larch; and
- reduce the age and increase the vigor of the understory.

The Corps evaluated several alternatives for meeting these objectives. During evaluation of the alternatives, it was determined that the removal of select trees coupled with the use of fire was essential to meeting the project objectives. Redstem ceanothus (*Ceanothus sanguineus*), the most dominant native forage species, requires heat scarification for seed germination. Fire is also the most efficient and economical method for reducing fuel loading. Therefore, all alternatives included the use of fire with the exception of the “No Action” alternative. Allowing wildfire (Alternative B) was eliminated due to the risk associated with damage on adjacent lands caused by escaped fire and the inability to prescribe the time and environmental conditions under which the fires would take place. The Corps land around Dworshak is primarily surrounded by timbered land managed for forest products. Further, much of the land surrounding the project area is private residential and the border can be considered wildland-urban interface. Conducting prescribed burns without timber harvest (Alternative C) was also considered, but eliminated. The risk of a stand-replacing fire,

which is both unnatural and undesirable, was considered too high. Helicopter logging only in conjunction with prescribed fire (Alternative D) was also eliminated from further evaluation after careful review. Helicopter logging only was not considered a viable stand-alone alternative for log yarding due primarily to the high cost associated with the use of helicopters and the limited areas in which helicopters could safely transport logs. Further, there are numerous overhead power lines within the project boundary and logs cannot safely be transported above overhead power lines via helicopter. Thus helicopter logging only cannot adequately meet the objectives of the project. Alternatives A and E were carried forward for further evaluation. Harvest Using Multiple Yarding Methods and Prescribed Fire (Alternative E) was selected as the preferred alternative. This alternative was determined to be the best alternative for accomplishing the project objectives and generally ranked higher in the long-term environmental benefits.

The Corps consulted with biologists from the U.S. Forest Service (USFS), Clearwater National Forest and the Idaho Department of Fish and Game (IDFG) during preparation of a biological assessment (BA). The USFWS concurred on November 16, 2010 (Appendix E) with the Corps' determination that the project may affect, but is not likely to adversely affect bull trout and bull trout designated critical habitat, Canada lynx, grizzly bear and grey wolf. The National Marine Fisheries Service (NMFS) did not concur with the Corps "not likely to adversely affect" decision and issued a Biological Opinion (BIOP) dated December 16, 2010 (Appendix F). This project would adhere to all requirements of the BIOP.

The Corps prepared and forwarded an archaeological report for the proposed project to the Nez Perce Tribal Historic Preservation Office (THPO) with a finding of "No historic properties affected." The THPO concurred with that finding in a letter dated February 10, 2011 (Appendix G).

The EA and Draft Finding of No Significant Impact (FONSI) have been made available to the interested public and Federal, state and local agencies for review and comment for 30 days, from January 8, 2013 through February 6, 2013.

Having reviewed the Environmental Assessment and associated appendices, I find that the documents provide sufficient discussions on the purpose of and need for the proposed action, alternatives, the environmental impacts of the proposed action and the alternatives, and a listing of agencies and persons consulted. Therefore, I believe these

documents provide sufficient evidence and analysis to meet the Corps' requirements pursuant to the National Environmental Policy Act and for the Corps to make a finding of no significant impact to the quality of the human environment. I have taken into consideration the technical aspects of the project, best scientific information available and public comments received. Based on this information, I find that implementation of the preferred alternative would not result in significant impacts on the quality of the human environment. Therefore, an environmental impact statement is not required.

_____ _____

Andrew D. Kelly
Lieutenant Colonel, Corps of Engineers
District Commander

Date

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SECTION 1.0 – INTRODUCTION

1.1 Background

The U.S. Army Corps of Engineers, Walla Walla District (Corps) proposes to restore the vegetative composition, form, and structure to a desired condition consistent with historic, natural ecosystem processes (wildfire) within the Ahsahka area by conducting selective harvest thinning (1,227 acres) and prescribed burning (937 acres) on approximately 1,738 acres of forestland at Dworshak Dam and Reservoir (Dworshak), Clearwater County, Idaho.

The proposed Ahsahka Stewardship Project is located near Dworshak Dam between river miles 0 and 4 on selected Corps-administered forestlands situated in Sections 23, 25, 26, 27, 34, 35, and 36 of Township 37 North, Range 01 East and in Sections 2 and 3 of Township 36 North Range 01East in Clearwater County, Idaho. A site location map is included in Appendix A, plate 1.

The Natural Resource Management Mission of the Corps is to “manage and conserve those natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations” (Corps 1966). Engineering Regulation 1130-2-540 defines three management concepts (stewardship, mitigation, and enhancement) in which all natural resource management activities would be accomplished. Given those concepts, this project is designed within the management concept of stewardship. Stewardship focuses on sustaining ecosystems through ecosystem management principles. This project also includes forest and woodland management based on the Forest Cover Act (PL 86-717). Forest and woodland management provides additional objectives to develop, maintain, protect, and/or improve vegetation conditions for timber, fish, wildlife, soils, recreation, water quality, and other beneficial uses. The need for this and similar management actions stems from the Corps' overall mission statement.

Planning of the Ahsahka Stewardship Project began in 2008 and the project is expected to be completed in 2016. The Corps intends to rely upon support of the Bureau of Land Management (BLM) for preparation of the timber sale contract including; sale planning, log transportation agreements and administration. BLM work would be funded primarily from timber sale proceeds.

The proposed Ahsahka Stewardship Project would likely begin in the summer of 2013, after the signing of a Finding of No Significant Impact (FONSI), if applicable. The FONSI determines if a project has no significant impact affecting the quality of the

human environment and if an Environmental Impact Statement (EIS) is required. If an EIS is required, the project would not begin until completion of an EIS and signing of a Record of Decision. Implementation of the project could extend over a 5-year period.

The Dworshak Final Environmental Impact Statement (FEIS) (Corps 1975a) states that habitat management on the 3,000+ acres of Dworshak lands, which are committed to wildlife, would involve selective timber cutting, burning, or fertilizing and seeding (pages 2-28 and 2-29). It also stated that "Over a period of years, a series of small habitat development sites would be provided to benefit both big game and nongame species of wildlife". This environmental assessment (EA) addresses selection of the Ahsahka area for implementation of habitat development efforts identified in the Dworshak FEIS. The EA also discusses and evaluates methodologies and timing.

1.2 Authority

Dworshak was authorized for construction in Public Law (PL) 87-874, approved October 23, 1962. Authority to manage Dworshak natural resources and to conduct stewardship projects is supported by the Dworshak Final Environmental Impact Statement (FEIS) (Corps 1975a); the Dworshak Public Use Plan (PUP) (Corps 2011); the Forest Cover Act (PL 86-717); the Flood Control Act of 1962, as amended (PL 87-874); and the Fish and Wildlife Coordination Act (PL 85-624). Agency guidance for implementing land management activities includes Engineer Regulation (ER) 1130-2-540, dated November 15, 1996, Management of Natural Resources and Outdoor Recreation at Civil Works Water Resource Projects. Stewardship projects are identified in ER 1130-2-540 as appropriate natural resource management activities.

1.3 Purpose and Need for the Ahsahka Stewardship Project

The purpose of the Project is to improve undesirable forest conditions within the Ahsahka project area and increase the amount of habitat for select native wildlife species. The Corps proposes to restore the vegetative composition, form, and structure to a condition consistent with historic, natural ecosystem processes (wildfire) within the Ahsahka area by conducting selective harvest thinning (1,227 acres) and prescribed burning (937 acres) on approximately 1,738 acres of forestland at Dworshak. The objectives of the Project are summarized as follows (for more detail, see Appendix B):

- Reduce the risk of stand-replacing wildfire.
  - Reduce ladder fuels
  - Reduce fire-intolerant trees
  - Reduce ground fuels
- Increase the proportion, average size, and the vigor of early seral tree species (ponderosa pine, Douglas fir, and western larch).

- Increase the recruitment of ponderosa pine and western larch.
- Reduce age and increase vigor of understory.

Project objectives are used in this EA to translate or define the underlying purpose of "Restore vegetative composition, form, and structure to a desired condition consistent with historic, natural ecosystem processes (wildfire)" into achievable project measures and development of alternatives. Project objectives for the proposed action focus primarily on forest ecology, define the standards that the proposed action and alternatives must meet, and are based on existing forest conditions and the anticipated forest conditions expected to exist under a natural fire regime.

1.3.1 Undesirable Forest Conditions

In conjunction with biologists from the U. S. Forest Service (USFS) Clearwater National Forest and in concert with the Interior Columbia Basin Ecosystem Management Project (ICBEMP) recommendations (ICBEMP 1997), the Corps has concluded that current stand conditions within nearly all stands are unnatural, unhealthy, and occurring as a result of fire suppression. The Corps has contracted with Clearwater-Potlatch Timber Protection Association (CPTPA) to suppress fires on Corps administered lands at Dworshak since 1965. Prior to 1965, CPTPA actively suppressed fires on this landscape, starting in about 1905 as part of their protection area.

The ecosystem processes that historically shaped the vegetative composition, form, and structure of the regional flora consisted of deposition of ash, glaciations, flooding, landslides, wind events, and wildfire. Of these, only the effects of landslides, wind events, and wildfire have been measurably altered by human activity. Landslides have increased on forested land due primarily to road construction. The effects of wind events have also increased due to logging's effect on natural windbreaks. The effects of these processes on the vegetative composition, form, and structure of the forest stands surrounding Dworshak Reservoir are considered negligible in comparison to the effects from fire suppression. Within Dworshak and the surrounding area, wildfire and its effects have been suppressed for over 100 years. Most habitat types occurring on Dworshak were historically affected by natural-occurring wildfire (see Appendix B). The past and present management action of fire suppression has drastically altered the vegetative composition, form and structure of most forest stands surrounding Dworshak and presumably all stands within the stewardship project. This is plausible based on historic fire regimes and further evidenced by the current forest conditions.
The potential for altered vegetative characteristics as a result of fire suppression increases inversely with the average fire interval. Thus the more frequent the historic fire interval the more potential variation from natural vegetative conditions from active fire suppression. All stands within the Ahsahka Stewardship Project boundary fall within

Fire Groups 1 and 2 and biophysical settings 80532 and 1010451. Thus the average fire interval for all Ahsahka project lands ranges from 6 -21 years for all fires. The area is estimated to have missed 5 – 15 fire cycles over the past 100 years. The expected measurable effects from fire suppression include; increased fuel loads, an increase in tree density and canopy closure, a shift from early to late seral tree species and an increase in the height of understory species. Most of these effects have been documented within the stewardship project boundary. Data collected at fourteen plots within Fire Group I habitat types occurring within the project boundary and data collected on six plots within Fire Group II habitat types occurring within the project are presented in Appendix B. These current conditions are compared to desired future conditions found in literature.

The current forest conditions do not reflect the natural regime, and, because of the effects from fire suppression described above, carry much higher risk for a stand-replacing wildfire. The term “stand-replacing fire” refers to a fire that kills nearly all small diameter trees and a large portion of the dominant overstory trees. This term will be used throughout this document. Lack of frequent underburns has also caused a build–up of ground fuels. Further, smaller diameter trees and trees with low hanging branches (most shade-tolerant trees) act as “ladder fuel” to carry the fire into the larger trees resulting in a stand-replacing fire. The event of a stand-replacing fire is considered undesirable given the historic fire patterns of these forest stands. Stand-replacing fire would destroy wildlife habitat and negatively impact air and water quality.

Fiedler et al. 1998, along with various other papers, describe target densities following restoration of ponderosa pine (*Pinus ponderosa*) forests. Basal area targets generally range from 40 to 80 square feet per acre on moderate sites with tree densities around 20 to 45 per acre given an average leave tree diameter of 18”. Based on this desired condition and existing conditions it is apparent that thinning and prescribed fire is warranted to restore the ponderosa pine ecosystem at Dworshak. Understanding that the habitat types present are on the drier end of the spectrum for pine restoration and that mature pine still exists on the site target basal area and tree densities will likely center around 60 and 30 respectfully.

1.3.2 Available Habitat for Select Native Wildlife Species

The change in species composition, form, and structure described above resulting from fire suppression has also reduced the amount of habitat for certain native wildlife species, which are now considered rare to imperiled in Idaho.

The ICBEMP has documented similar conclusions regarding Idaho’s forests. They document a substantial absence of lower montane late seral ponderosa pine forests within the Clearwater Basin in comparison to historical conditions (ICBEMP 1997). This

condition is attributed to logging and fire suppression activities. As a result of the present condition, ICBEMP has also documented a scarcity in associated wildlife. Many species requiring late seral ponderosa pine forests are now scarce or absent within the basin (e.g., white-headed woodpeckers, flammulated owls, and pygmy nuthatches).

The Idaho Bird Conservation Plan, created by Partners in Flight (PIF), identifies the need for the conservation, protection, and restoration of ponderosa pine ecosystems (Ritter et al. 2000). The Ecosystem Management Research Institute (EMRI) under contract with PIF has identified the extent and location of historic and existing ponderosa pine ecosystems within Idaho. The EMRI estimates 85 – 98 percent of historic ponderosa pine ecosystems in Idaho have been lost to logging, agriculture, and fire suppression (Mehl and Haufler, 2004). Regional impacts to several native wildlife populations have been attributed to these changes in forest condition, namely, pygmy nuthatch (*Sitta pygmaea*), Lewiss' woodpecker (*Melanerpes lewis*), and flammulated owl (*Otus flammeolus*). The PIF, through the Idaho Bird Conservation Plan, is advocating the restoration of ponderosa pine ecosystems through thinning and burning within dry ponderosa pine/Douglas-fir (Pseudotsuga menziesii)/grand fir (Abies grandis) habitat types. The EMRI has identified these habitat types as historically being dominated by ponderosa pine given the fire regime.

Many areas downstream of Dent Bridge on Dworshak Reservoir consist of habitat types described above. Of these areas, Ahsahka was selected for treatment based on the proportion of these dry habitat types and the ease of access. All forest stands occurring within the Ahsahka Stewardship Project boundary are dry ponderosa pine, Douglas fir or grand fir habitat types. Level two inventories show these forest stands as being outside of the expected conditions given habitat type and fire regime and are not providing habitat for specific wildlife species. For further information and discussion, see Appendix B. A monitoring plan has been developed that would be used to measure the success of the plan (see Appendix C).

1.4 National Environmental Policy Act (NEPA) Compliance

A Final EIS evaluating the environmental impacts from the operation of Dworshak was prepared in 1975 (Corps 1975). The impacts from both selective timber harvest and prescribed burning were evaluated in the FEIS. However, the purposes for both timber harvest and prescribed burning are different for this project. Purposes for timber harvest in the 1975 FEIS focused on sanitation and thrift. Today, the Corps' natural resource management mission focuses on ecosystem management. Methods for timber harvest have changed as well. Further social, economic, and environmental settings have changed. As a result, this EA augments findings in the FEIS, specifically regarding timber harvest and prescribed burning in the Ahsahka area, and is a standalone EA.

SECTION 2.0 - PROPOSED ACTION AND ALTERNATIVES

This section describes and evaluates an array of reasonable measures for meeting the project objectives and develops a reasonable range of alternatives using the measures. In addition, alternatives eliminated from further evaluation are identified along with the reasons for their elimination. See Chapter 3 for detailed discussion of environmental impacts associated with each alternative carried forward.

2.1 Description and Evaluation of Potential Measures

The following paragraphs identify and evaluate potential measures to meet the project objectives. Refer to table 2-1 for a list of identified measures. These measures were integrated in varying combinations to form logical alternatives based on this evaluation. The “No Action” Alternative is required by NEPA and serves as a baseline against which all other alternatives are evaluated and as used in this document means no change to present management activities (i.e., no action would be taken to address the undesirable forest conditions addressed in section 1.3). To better identify potential measures to achieve the purpose, the project objectives identified in paragraph 1.3 are listed below and potential measures are discussed within each. For the sake of brevity, measures described in this section are deemed “Good” unless otherwise stated.

2.1.1 Reduce Risk of Stand-Replacing Fire

The current forest conditions carry a much higher risk for a stand-replacing wildfire. Lack of frequent underburns has caused a buildup of ground fuels. Further, smaller diameter trees and trees with low hanging branches (mostly shade-tolerant trees) have increased and act as “ladder fuel” to carry the fire into the larger trees potentially resulting in a stand-replacing fire. The event of a stand-replacing fire is considered undesirable given the historic fire patterns of these forest stands. Stand-replacing fire would destroy wildlife habitat and negatively impact air and water quality.

Reducing the risk of stand-replacing fire within these forest stands can be accomplished through the following: (1) reducing the amount of “ladder fuel;” (2) reducing the amount of fire-intolerant tree species (grand fir, western red cedar, and small diameter Douglas fir); and (3) reducing ground fuel.

2.1.1.1 Reducing Ladder Fuel

Measures: Slashing and/or pruning: Ladder fuels are defined here as trees that have the potential to carry a ground fire up into the forest canopy. One type of ladder fuel is small diameter trees within the drip line of reserve trees. Slashing these small diameter trees would involve cutting down at the base. This would reduce these ladder

fuels to ground fuels. Another type of ladder fuel is larger diameter trees with low hanging branches. These trees are fire-intolerant, partly due to the low hanging branches but also due to thin bark. The trees themselves may be treated through either harvest or slashing (see Reducing Fire-Intolerant Trees below). Pruning would involve removing the lower branches of reserve trees which have small diameter trees within the drip line. This would reduce the potential for fire to carry up into the forest canopy. Slashing is deemed an **excellent** method of reducing ladder fuels. Pruning is considered a **poor** method since it would likely not achieve similar results in reducing the potential for a stand-replacing fire. Further, pruning would be extremely labor intensive and expensive. In both cases (slashing and pruning) ground fuels would increase.

2.1.1.2 Reducing Fire-Intolerant Trees

Measures: Harvest and/or slashing: Several tree species mentioned previously are fire-intolerant. These trees are much more likely to "crown out," i.e., burn completely through the top (crown) of the tree. Reducing the density of these trees in the forest would reduce the risk of a stand-replacing fire. This can only be accomplished by removing the trees. Harvest and/or slashing are the logical options. Both have similar ability to selectively remove fire-intolerant trees. However, slashing is much more costly and would likely leave too much ground fuel acerbating the fire risk. Harvest would be more economically feasible, but have more environmental impacts. Based on these, harvest is considered a **good** option and slashing **poor**. Of the harvest options (tractor yarding, line skidding and helicopter yarding), helicopter yarding, simply by the nature of the method, has a reduced potential for large-scale use across the landscape, and is less flexible in selectivity of trees for removal. It is, therefore, considered an **average** option. Also helicopters cannot safely haul logs above overhead power lines, which limit its ability to meet the objectives for harvest in certain areas.

2.1.1.3 Reducing Ground Fuels

Measures: Transporting, piling/burning and/or prescribed fire: Reducing ground fuels is another way to reduce the overall risk for a stand-replacing fire. Reducing the ground fuels can be done by transporting them off-site, piling and burning them, and/or broadcast fire. It should be noted that "broadcast" is not the same as "prescribed burning. Prescribed includes all types of burns that are used as a course of action, or "prescribed". Broadcast burning is the burning of fuels or slash in a given area. Both transporting or piling and burning the fuels would require piling (burn piles or staging piles). Piling can be done either by hand or mechanically. Hand piling is extremely expensive but less intrusive. Mechanically piling, typically done by tractors, would have a much greater impact on soils. Broadcast fire also greatly reduces ground fuels but carries with it a risk for stand-replacing fire. With some pre-burn measures (steps taken

prior to burning to reduce the potential of stand replacing fire) such as described above, prescribed broadcast burns (versus trying to contain naturally-occurring wildfire) can be conducted with little risk. All options have the ability to adequately reduce ground fuels and thus are considered viable options. However, controlled wildfire has a greatly reduced chance of meeting the objectives, has a high amount of risk, and is therefore considered a **poor** measure for reducing ground fuels. Based on a combination of potential environmental impact and economic feasibility, prescribed fire is considered an **excellent** option.

2.1.2 Increase Proportion, Size, and Vigor of Early Seral Tree Species

Measures: Harvesting, girdling, slashing and/or fire: The proportion, average size, and vigor of early seral tree species (ponderosa pine, Douglas fir, and western larch) need to be increased. The desired forest composition, form, and structure consists of an overstory of sparse (10-40 trees per acre), large diameter, early seral tree species. Given the current conditions, this would require the removal of primarily small diameter, late seral trees. Recognized methods to achieve this are harvesting, girdling, slashing, and using fire.

Harvesting allows for great selectivity in tree removal. Limited slash generated from harvest operations can be used to facilitate a moderately intensive prescribed ground fire on the site. Generally, harvesting results in greater environmental consequences. The following methods for the yarding of timber were considered: ground-based machine yarding (tractor), line skidding, and helicopter yarding. If the helicopter yarding method were used alone, very limited roads would be constructed and all firebreaks would be constructed by hand. All harvest methods (except helicopter yarding) would adequately increase the frequency of early seral tree species and are therefore considered **good** options. Helicopter yarding, because the potential for large-scale use across the landscape and selectivity of trees would be less than other harvest methods, may have a slight reduction in selectivity and does not work safely around power lines and is therefore considered to be an **average** option.

Girdling refers to removing a large section of bark from the tree trunk. This eventually kills the tree leaving a dead-standing tree. This method is also very selective and can achieve the objectives. However, this method leaves a lot of standing fuel that would not be conducive to burning, which is required to meet subsequent objectives. This method was deemed **poor** due to the increase in fuel loading.

Slashing refers to simply cutting down the trees and leaving them lay. It can include lopping the trees and branches into smaller pieces and scattering them to facilitate a prescribed burn. Again, this method is very selective and would likely meet the objective. However, if this method were employed alone, it would likely leave too much

fuel on the ground for burning. There would be a very high potential for a stand-replacing fire. Slashing has very little anticipated environmental consequences. Slashing was deemed **average**.

Burning can be accomplished through prescribed fire or wildfire. Both burn methods have the potential to meet the objectives if environmental conditions are right. Typically, the large diameter, early seral tree species are the most fire resistant. Therefore, if environmental conditions are right, a moderate-intensity burn could remove the appropriate trees leaving dominate, early seral trees. However, achieving the right environmental conditions, given the current forest conditions, is extremely unlikely especially with wildfire when the timing of the fire cannot be selected. With both burn methods, the potential for a stand-replacing fire is very high. Prescribed burning and/or wildfire to remove trees would be costly. Because of the improbability of conditions being right for both wildfire and prescribed burning to meet objectives they were not desirable. Wildfire was deemed a **poor** option and prescribed burning **average**.

2.1.3 Increase the Recruitment of Ponderosa Pine and Western Larch

Measures: Creating seedbeds (mechanical or fire) and/or planting: This objective can be met either by creating seedbeds near existing stands of these species or by hand-planting seedlings. To successfully increase the recruitment of pine and larch, these measures must be accompanied by forest thinning to allow more sunlight to reach the forest floor. Ground disturbance is required to create seedbeds. Selective harvest and/or slashing described previously would be used to open the forest. Ground disturbance can be accomplished with machinery or fire. Mechanical ground disturbance is impractical and greatly affects soils and water quality. Mechanical ground disturbance was considered **poor**. Fire has a great potential to meet the objective with little environmental impacts. Prescribed burning has a substantial advantage over wildfire, because of the need for fire within specific areas and the random nature of wildfire events. Prescribed burning was considered an **excellent** option and wildfire a **poor** option. Planting is labor intensive and natural regeneration is considered a more ecological method for meeting this objective. Planting was considered a **poor** option.

2.1.4 Reduce Age and Increase Vigor of Understory

Measures: Slashing and/or fire: This objective is designed to restore the understory to conditions expected ecologically and to improve forage conditions for big game. The current understory is over mature (too tall and decadent) and, thus, is not available or palatable for big game species. This is typically accomplished by either slashing the existing understory or by burning it. Slashing is used very effectively in areas where the existing understory or brush field is dominated by high quality forage species (redstem

ceanothus, serviceberry, mountain maple, willow, chokecherry, and elderberry). Slashing, used under those conditions, results in a reduction of overall forage biomass and increases the biomass of regrowth that is available, palatable, and nutritious for big game. The necessary component making slashing successful at improving forage conditions is the existing occurrence of high quality browse species. The current understory within the majority of the project area consists of brush, which is not considered suitable as big game forage (predominately snowberry, oceanspray, and mallow ninebark). Slashing these species would only result in increased regrowth of unsuitable forage and thus is considered only **average** due to the site conditions.

Fire can also be used to reduce the age and increase the vigor of the understory. Unlike slashing, fire has much greater potential to germinate existing seed in the ground. Thus, fire has a higher potential to improve forage conditions when the existing understory is not available and/or palatable for big game species. Redstem ceanothus is an early seral browse species and is the most palatable and nutritious native forage for big game within the region. Seed of this species can remain viable in the ground for up to 300 years. Redstem ceanothus is fire adapted requiring heat scarification of the seed coat in order to germinate. Only fire can bring about adequate germination of redstem ceanothus along with rejuvenation of other high quality browse species. Prescribed burning was considered an **excellent** option. Although the controlled use of wildfire (natural fire) reduces the risk associated with a stand-replacing fire, wildfire is random and has little potential to meet the objectives.

2.2 Summary of Measures Evaluation

Table 2-1 below shows a comparison of the measures and associated rankings described in the sections above.

Table 2-1. Comparison of Potential Measures

	Harvest Methods									
Components of Project Objectives	Tractor Yarding	Line Skidding	Helicopter Yarding	Slashing	Pruning	Wildfire	Prescribed Burning	Work by Hand	Mechanical	Girdling
Reduce Ladder Fuels				Excellent	Poor					
Reduce Fire-Intolerant Trees	Good	Good	Average	Poor						
Reduce Ground Fuels						Poor	Excellent	Good	Good	
Increase proportion and size of early seral trees	Good	Good	Average	Average		Poor	Average			Poor
Increase Recrutiment of Ponderosa Pine and Western Larch (Ground Disturbance/Planting)						Poor	Excellent	Poor	Poor	
Reduce Age and Form of Understory				Average		Poor	Excellent			

Based on the above evaluation, harvest, and more specifically, conventional yarding methods (tractor and line skidding) were considered the best methods for reducing the frequency of fire intolerant trees and increasing the proportion and size of early seral tree species. Slashing was determined to be a much more viable method for reducing

ladder fuels compared to pruning. Utilizing prescribed fire was determined to be the best method for reducing ground fuel, increasing ponderosa pine recruitment, and reducing the age and form of the understory. This evaluation of the potential measures to meet the project objectives was used heavily to develop the alternatives.

2.3 Development of Alternatives

Several determinations were made based on the evaluation of measures above. One was that fire must be included in all action alternatives to adequately meet the project objectives. Further, to safely utilize fire, the slashing of ladder fuels must be accomplished in conjunction with fire. Pruning, the other method for reducing ladder fuels, was eliminated as a measure. Given the use of fire, the need for removing ground fuels by hand and mechanically, planting, mechanical ground disturbance and girdling were eliminated for use in developing the alternatives. Thus, using fire as the foundation, four logical action alternatives were developed from the potential measures: “No Action,” “Natural Fire,” “Prescribed Fire,” “Harvest Using Helicopter Yarding and Prescribed Fire,” and “Harvest Using Multiple Yarding Methods and Prescribed Fire.”

The following paragraphs describe the alternatives and summarize the environmental consequences. For further information on alternatives carried forward, refer to Section 3.0. Each of the alternatives would include long-term monitoring. To view the monitoring plan, see Appendix C.

2.3.1 Alternative A: No Action

2.3.1.1 General

The no action alternative would result in the continuation of current management activities that focus on facilities maintenance and other functions in support of low-density recreation and access management. Fire suppression activities currently contracted through the Clearwater/Potlatch Timber Protection Association (CPTPA) would also continue in the project area under the no action alternative. No action would be taken to address the undesirable forest conditions addressed in section 1.3.

2.3.1.2 Summary of Environmental Consequences

This alternative would have little to no short-term effect on topography and soils, air quality, recreation, aesthetics, cultural resources, threatened and endangered species, and the current socioeconomic condition. The forest would continue down an unnatural, succession pathway inconsistent with historic ecological processes (see Appendix B).

The risk of a stand-replacing wildfire would continue to increase. The ecological forest condition would continue to decline having long-term effects upon the terrestrial environment, including wildlife habitat. No adverse impacts are anticipated to either bald eagles and or their habitat.

2.3.2 Alternative B: Natural Fire

2.3.2.1 General

This alternative would attempt to employ wildfire in a controlled setting. Allowing wildfire to burn without controls is not practical within the Ahsahka landscape. However, utilizing wildfire with controls, termed natural fire alternative, has the potential to meet objectives with limited risk. The Corps would construct firebreaks around the Ahsahka Stewardship Project area and would not suppress wildfires but allow them to burn naturally. Firebreaks would be constructed and re-constructed annually with dozers, where possible, and by hand in remaining areas. Firebreaks would have to be substantial in size, which would reduce the area of desirable targeted natural cover types. Fire suppression activities currently contracted through the CPTPA would cease for the project area. Allowing natural wildfires to burn has the potential to achieve the desired forest conditions of enhancing ecosystem integrity by reestablishing vegetative composition, form, and structure consistent with natural ecosystem processes. Several assumptions must be accepted to realize this potential:

- Natural wildfire would occur on the site through drought conditions and/or lightening within a reasonable period.
- Wildfire would cover an adequate amount of the project area and affect only the dry forest types; not the mature cedar stands and other riparian habitats.
- Wildfire would occur at a time when environmental conditions are optimal, resulting in a moderately intense fire without becoming stand replacing.
- Constructed firebreaks would prevent the wildfire from spreading to adjacent lands.

Due to the current conditions of the forest stands, the timing of a wildfire, or a series of wildfires, would be crucial to meeting the objective. The likelihood of the above assumptions being met is extremely low. It is possible that a random wildfire could achieve the project objectives under the right environmental conditions. However, it is more likely that, given the current conditions, a stand replacing fire would result from wildfire in the project area. A stand-replacing wildfire, likely to occur under this alternative, would not meet the stated objectives. Thus, given the current conditions, this alternative does not meet the purpose, or the objectives.

2.3.2.2 Summary of Environmental Consequences

If the above assumptions are met, the following environmental consequences are expected: Initial work to create massive firebreaks would likely decrease water quality and displace wildlife in the short term. Reconditioning firelines annually would be less intense than the initial construction, but would have similar effects. The wildfire could drastically decrease air quality in the short term greatly affecting avian species, including bald eagles. The timing of the burn would not be controlled and airshed conditions may not be optimal for burning as would be with prescribed fire. This has a high potential to greatly affect the human environment and wildlife, particularly avian species. Following the burn, increased soil erosion and stream sedimentation would occur but would likely be short term. However, major impacts to resident fish reproduction could happen, if the wildfire occurs during spawning or anytime before fingerling stage is achieved by the young of the year. Increased short-term turbidity from sediment that would run-off of large burned areas could also negatively impact anadromous fish. Long-term effects would likely be beneficial to the forest ecosystem and wildlife. This alternative would likely have a greater adverse impact to aesthetics both short and long term given a more intense fire.

The potential for the assumptions to be met is highly unlikely. There is a high probability that wildfire would occur during extreme weather and environmental conditions. This would result in a stand-replacing wildfire given the current forest conditions. Under this scenario, the short-term environmental consequences would be highly adverse for all categories. Long-term consequences would be lessened considerably after an extended period of recovery. Unsuppressed fire could damage all species and move beyond the project boundaries and onto private land. A stand-replacing fire could destroy soils and seedbeds and affect forest recovery for 50 or more years.

2.3.3 Alternative C: Prescribed Fire

2.3.3.1 General

The Corps would construct firebreaks around the proposed project area, treat ladder fuels, and conduct a prescribed burn. Units to be burned would be delineated based on a detailed survey of the area. Firebreaks would be constructed to protect adjacent lands and areas within the project not scheduled for burning. The treating of ladder fuels and the construction of firebreaks would be primarily completed by hand, therefore, minimizing the use of heavy equipment. However, firebreaks would have to be substantial in size to prevent fire escaping onto adjacent land and, thus, would necessitate the use of heavy equipment in some areas. Prior to prescribed burning, the Corps would slash saplings and shrubs to reduce the density of understory ladder fuels.

Unlike the use of natural fire as a management tool, a prescribed fire would not have to occur as a random event. Prescribed fires would be scheduled to occur within an adequate timeframe and minimize the potential for stand-replacing fires. Firefighting crews and equipment would be on hand to act if the fire progressed beyond a desired condition.

This alternative has some potential to achieve the desired forest conditions of enhancing ecosystem integrity by reestablishing vegetative composition, form, and structure consistent with natural ecosystem processes if the burn is kept to a low- to moderate-intensity ground fire. This alternatives ability to selectively remove shade-tolerant, late-seral tree species would be greatly reduced. Trees killed in a fire would be greatly influenced by physiographic characteristics of the site and the location and distribution of fuels greatly reducing selectiveness and potential to meet project objectives. Also, as with Alternative B, Natural Fire, the potential for a stand-replacing fire would still be high. As discussed in section 2.3.2.1, a stand-replacing fire would not bring about the desired project objectives. Areas of substantial dense trees of harvestable size could still cause the fire to burn too hot and potentially move into adjacent areas. As with Alternative B, the extent of necessary firebreaks would reduce the affected area. It would also be a costly alternative considering the number and size of firebreaks along with the cost of the slashing operation and the prescribed fire. Removal of undesired tree species would be limited under this alternative. Additionally, recruitment of ponderosa pine and western larch with prescribed fire alone would not meet the objectives. Prescribed fire alone cannot meet the purpose and need of the project.

2.3.3.2 Summary of Environmental Consequences

The potential negative effects of constructing adequate firebreaks, as described in paragraph 2.3.2.2, would only be slightly reduced in comparison to Alternative B, Natural Fire. With current stand conditions, the juxtaposition of adjacent landowners and the consequences of the fire moving onto adjacent lands would keep the environmental consequences of this alternative only slightly lower than that of Alternative B. The risks would still be very great and firebreaks would need to be extensive. Thus, initial work to create firebreaks would likely decrease water quality and displace wildlife in the short term. The wildfire would decrease air quality in the short term and potentially impact raptors. Following the burn, increased soil erosion and stream sedimentation would occur. This would likely be short term but may have impacts to resident fish reproduction. Long-term effects would likely be beneficial to the forest ecosystem and wildlife. Increased short-term turbidity from sediment that would run-off of large burned areas could also negatively impact anadromous fish. No adverse long-term impacts are expected for bald eagles or bull trout. Aesthetics would be reduced short term but expected to improve in the long term.

2.3.4 Alternative D: Harvest Using Helicopter Yarding and Prescribed Fire

This proposed alternative would employ helicopter yarding, vegetation slashing, and prescribed fire to meet stated project objectives.

2.3.4.1 Harvest

Helicopter yarding would be the only yarding method considered under this alternative. The entire project would be evaluated for helicopter yarding and only be employed where possible. Based on preliminary assessments, many areas would not be harvested due to potential conflicts with existing overhead power lines. As a result, harvest by helicopter yarding would occur on much less acres than needed to satisfy the project objectives.

Heavy equipment use would be minimized. Slashing ladder fuels and constructing firebreaks would be primarily accomplished by hand. New road construction and road reconstruction would be minimized. This alternative is expected to result in two miles of road reconstruction, 1.4 miles of new road construction, and minor maintenance on 2.8 miles of road. Approximately 15 new culverts would be installed; however, of these culverts, only one would be installed at an intermittent stream. The construction of new roads would require felling timber, clearing, grubbing, and excavation. All trees 20 feet on each side of the centerline would be felled. Clearing and grubbing would remove all trees, logs, brush, stumps, roots, slash, and other woody material embedded in the ground. Excavation, the final step for general new road construction includes creating the road surface and embankments. The road width (running surface) for both new and reconstructed roads would be 12 feet. The cut slope is cut down and leveled out to form the subgrade width with a proper fill slope ratio (common is 1 1/2:1). All sale area roads would be one lane and generally consist of native surface material. Pit run rock would be applied to the native surfaces in areas that are steep or poorly drained and at all live water crossings. Pipe culverts and pipe-arch culverts would be bedded on a selected granular or fine readily compactable soil material having a depth of not less than 10 percent of the diameter or height of the drainage structure concerned. Road reconstruction would consist of reconditioning and preparing the roadbed and shoulders, cleaning and shaping drainage ditches, trimming vegetation from cut and embankment slopes, and cleaning, repairing, and upgrading drainage structures of existing roads. Subsequent to project completion, all roads and skid trails would be water barred and grass seeded to reduce the potential for erosion.

Slashing ladder fuels would also be employed prior to prescribed burning to reduce the potential for a stand-replacing fire.

2.3.4.2 Prescribed Burning

Units to be burned would be identified based on known fire behavior, topography, aspect, slope, and fuels. Firebreaks would be constructed to protect adjacent lands and areas within the project not scheduled for burning. Fire lines would be constructed by hand to minimize heavy equipment use and soil disturbance and no ignition would be conducted within RHCAs. Prescribed burning would be conducted within 1-3 years following harvest. Broadcast burns would be prescribed within grasslands and in forested areas where Douglas fir, ponderosa pine, and/or western larch dominate. Grand fir (*Abies grandis*) and western redcedar (*Thuja plicata*) trees are much less fire resistant and, therefore, broadcast burning would not be planned. A total of 937 acres would be broadcast burned. The Corps coordinated with adjacent landowners regarding this project. Broadcast burns may occur on adjacent lands simultaneously with the Corps' prescribed burning efforts.

2.3.4.3 Project Objectives

Harvesting and slashing prior to prescribed burning would greatly reduce the potential for a stand-replacing fire. A low- to moderate-intensity prescribed fire is needed to reduce fuel loading, regenerate early seral tree species, and rejuvenate big game browse while not destroying the desired leave trees (those trees remaining after logging activities). The extent of necessary firebreaks would be reduced, as compared to previous alternatives, maximizing the affected area.

Helicopter yarding has the potential for achieving the desired species composition, form, and structure over most of the project area. However, the cost, reduced selectivity and the limited use lessen this option's ability to meet all project objectives. Revenue is not an objective of this project, yet funds generated from the timber sale are needed to pay for other necessary aspects of this project, namely prescribed burning. Normal annual budgets would not be sufficient to support the prescribed burning required by this alternative to meet the objectives, when used in conjunction with helicopter yarding alone. The costs associated with helicopter yarding would limit the amount and selectivity of harvesting targeted trees. Thus without proceeds from timber sales the prescribed burning would not occur, the project objectives could not be met. Further, there are numerous overhead power lines within the project boundary and logs cannot safely be transported above overhead power lines via helicopter. Yarding using helicopters as the only yarding method with prescribed fire cannot meet the purpose and need of the project.

2.3.4.4 Summary of Environmental Consequences

Minor roadwork, firebreak construction, and prescribed burning could impact soils and water quality in the short term. Preventative measures would be employed to minimize sediment delivery to streams. Long-term change in understory (prescribed fire) and overstory (harvest) vegetation would slightly increase potential sediment delivery to the streams and reservoir.

Prescribed burning would likely impact short-term air quality. Idaho has developed air quality standards and a smoke management plan for northern Idaho. These standards exceed the standard recommended by the U.S. Environmental Protection Agency in their May 1998 Interim Air Quality Policy on Wildland and Prescribed Fires. Smoke management experts from the Montana/Idaho Airshed Group (Group) assess regional air quality and monitor weather in an effort to best regulate regional prescribed burning efforts and meet the intent of the Clean Air Act. Large prescribed fire activities associated with this project would be coordinated through the Montana/Idaho Airshed Group. Consequently, large fires would only be allowed during times preferable for minimizing impacts to air quality.

Impacts to the vegetation are expected to be minor in the short-term and beneficial in the long-term. Short-term impacts would primarily result from a reduction in shrub cover because of the prescribed fire. Long-term changes in vegetation should result in improved habitat for native wildlife species associated with more open forest structure.

Activities associated with this alternative (roadwork, helicopter yarding, firebreak construction, slashing, and prescribed burning) would likely result in the temporary displacement of some terrestrial species. The extensive use of helicopters is expected to have greater short-term displacement of localized terrestrial species. The long-term effects should be beneficial, as changes in forest conditions should favor habitat suitability for select native wildlife species.

Species that may occur within the action area listed as threatened or endangered include Snake River (SR) Fall Chinook salmon *(Oncorhynchus tshawytscha)*, and SR steelhead *(O. mykiss)*, Canada lynx *(Lynx canadensis)* and Bull trout *(Salvelinus confluentus)* all listed as threatened. Anadromous fish have not existed above Dworshak dam since its completion in 1972. Given helicopter yarding only, the establishment of riparian habitat conservation areas (RHCAs) around streams and prohibiting prescribed fire ignition within the RHCAs, this alternative is expected to protect aquatic habitat. Further, no permanent streams occur within the stewardship project boundary. Canada lynx are generally found at elevations above 3,750 feet and are not likely to occur in the proposed area. This alternative would not likely adversely impact these species.

Since no ground-based yarding would occur with this alternative, minimal adverse impacts to aesthetics and recreation are expected. Logging and prescribed burning would likely result in a short-term impacts to aesthetics and cause short-term disturbance to recreationalists. However, green-up is expected the next spring leaving very short-term impacts.

No cultural resources would be impacted with this alternative.

Benefits to the socioeconomic condition would include a short-term increase in jobs and potentially a minor increase in long-term jobs.

2.3.5 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

This alternative includes tractor, line skidding, and helicopter yarding; slashing of vegetation; and prescribed burns to meet the project objectives.

2.3.5.1 Harvest

The Corps would employ tractor, line skidding, and helicopter yarding methods to restore the species composition, form, and structure. Timber harvest would occur only in areas where needed to meet project objectives. Helicopter yarding would be employed only in areas where other methods are not feasible and is expected to occur on approximately 131 acres. Line skidding would be used where existing roads occur and where slopes generally exceed 35 percent, this type of action would occur on approximately 1,022 acres. Tractor yarding would be employed in all areas where existing roads occur and slopes are less than 35 percent and would occur on approximately 73 acres (see Appendix A, plate 2). Branches and tops would be lopped and scattered in the field where needed to facilitate the prescribed burning. Logs would be transported to mills.

The use of various yarding methods, as described above, would work to minimize new road construction and road reconstruction (Table 2-2). Fifteen new culverts would be installed. One of the 15 culverts would be installed within an existing stream. See Alternative D for a description of how road construction/reconstruction would generally be conducted. Subsequent to project completion, all roads and skid trails would be water barred and grass seeded to reduce the potential for erosion. Corps regulations allow public motorized use on designated roads only. No additional roads would be designated for public motorized use as a result of this action. To minimize unauthorized motor vehicle use, physical barriers would be utilized during and after the project. Slashing ladder fuels would also be employed prior to prescribed burning to reduce the potential for a stand-replacing fire.

Table 2-2. Proposed Miles of Road Construction

Road Action	Road Count	Sum in Miles	Comments
New Construction	15	5.0703	
Reconstruction of Existing Road	19	5.7218	
Minor Maintenance	12	13.3091	
None	5	13.3086	Roads to be used but no maintenance action needed due to road jurisdiction (i.e. State/Federal highway)

2.3.5.2 Prescribed Burning

Fall prescribed burning would be conducted within 1-3 years following harvest. Prescribed burns would be conducted within grasslands and in forested areas where Douglas fir and/or ponderosa pine dominate. This includes burning 937 acres (Appendix A, plate 3). The Corps has corresponded with adjacent landowners regarding this project and the proposed alternatives. Prescribed burns may occur on adjacent lands in conjunction with burns on Corps lands.

2.3.5.3 Project Objectives

This alternative would satisfy the stated project objectives. Harvest greatly increases the potential for achieving the desired vegetative form, composition, and structure. Undesirable tree species and sizes can be selectively removed. Using both harvest and slashing prior to prescribed fire also greatly reduces the potential for stand-replacing fire. A low- to moderate-intensity prescribed fire is needed to reduce fuel loading, regenerate early seral tree species, and rejuvenate big game browse while not destroying the desired leave trees. The extent of necessary firebreaks would be reduced, as compared to previous alternatives, maximizing the affected area.

2.3.5.4 Summary of Environmental Consequences

Activities associated with this alternative (roadwork, logging, firebreak construction, slashing, and prescribed burning) would likely result in the temporary displacement of terrestrial species. The long-term effects should be beneficial, as changes in forest conditions should favor habitat suitability for target species.

Roadwork, firebreak construction, and prescribed burning would likely impact soils, water quality, and fisheries in the short term. The installation of one culvert at an intermittent stream would have a minor impact to water quality and the aquatic environment. Preventative measures would be used to reduce the potential for short-term impacts to water quality and fisheries. Long-term changes in understory (prescribed fire) and overstory (harvest) vegetation would slightly increase overall sediment delivery to the streams and reservoir.

Prescribed burning would likely cause short-term negative impacts to air quality. Idaho has developed air quality standards and a smoke management plan for northern Idaho. Large prescribed fire activities would conform to the standards of the Northern Idaho Airshed Group. This would greatly minimize impacts.

Species that may occur within the action area listed as threatened or endangered include Snake River (SR) Fall Chinook salmon *(Oncorhynchus tshawytscha)*, and SR steelhead *(O. mykiss)*, Canada lynx *(Lynx canadensis)* and Bull trout *(Salvelinus confluentus)* all listed as threatened. Anadromous fish have not existed above Dworshak dam since its completion in 1972. Given best management practices identified in Section 2.5, this alternative is expected to protect aquatic habitat. Further, no permanent streams occur within the stewardship project boundary. Canada lynx are generally found at elevations above 3,750 feet and are not likely to occur. This alternative would not likely adversely impact these species.

The use of both tractor yarding and line skidding would likely create adverse impacts to aesthetics. The overall design of this project should lessen those impacts. Green-up is expected the next spring leaving very short-term impacts. Similar short and long-term impacts are expected for recreation.

This alternative has a high potential to benefit the local socioeconomic conditions both short-term and long-term. An increase in jobs needed to achieve the work would create short-term benefits and project revenues could create future natural resource jobs.

2.4 Comparative Discussion

Each of the above alternatives was evaluated based on their potential ability to meet the project objectives and the potential environmental consequences.

Alternatives B (Natural Fire), C (Prescribed Fire) and D (Harvest Using Helicopter Yarding and Prescribed Fire) were eliminated from further evaluation based on not meeting the project objectives and the associated risks resulting from stand-replacing wildfire. Under Alternative B, it is likely that a stand replacing fire would result from wildfire in the project area, which would not meet the objectives. Alternative C would not meet the objective of reducing the risk of stand-replacing wildfire, reducing fire-

intolerant trees, or recruitment of ponderosa pine and western larch with prescribed fire alone. Alternative D would greatly reduce the potential for a stand-replacing fire, but the reduced ability for the amount of prescribed fire necessary, combined with the limitations in selectivity and issues with safety using only helicopters for yarding harvested timber, mean that this alternative doesn't meet the objectives of increasing the proportion, average size, and vigor of early seral tree species, or the recruitment of ponderosa pine and western larch.

Two alternatives were carried forward for further review: Alternative A (No Action), and Alternative E (Harvest Using Multiple Yarding Methods and Prescribed Fire).

Alternative A is carried forward as a requirement of NEPA, as it does meet the project purpose and need. Alternative E would satisfy all of the stated project objectives. Harvest greatly increases the potential for achieving the desired vegetative form, composition, and structure. Undesirable tree species and sizes can be selectively removed. Using both harvest and slashing prior to prescribed fire also greatly reduces the potential for stand-replacing fire. A low- to moderate-intensity prescribed fire is needed to reduce fuel loading, regenerate early seral tree species, and rejuvenate big game browse while not destroying the desired leave trees. The extent of necessary firebreaks would be reduced, as compared to previous alternatives, maximizing the affected area.

SECTION 3.0 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental resources (environment) of the area that would be affected by the alternatives or that would affect the alternatives described in Chapter 2. This Chapter also describes probable impacts and effects (consequences) of each alternative on those same resources. See Chapter 2 for detailed descriptions of the alternatives.

3.1 Topography and Soils

3.1.1 Affected Environment

Dworshak is located within the Clearwater River watershed, a subbasin of the lower Snake River watershed. There are two major tributaries on the north bank: Elk Creek and Little North Fork. Dworshak is formed in the steep-sided North Fork and Little North Fork Valleys. Rising abruptly from the reservoir's full pool elevation of 1,600 feet mean sea level (msl), the neighboring mountains and ridges reach elevations of over 5,000 feet msl. Steep slopes dominate the shoreline and Corps lands. Relatively few flat or low-slope areas exist. The major exceptions are the Three Meadows, Elk Creek Meadows, Little Bay, Freeman Creek, and Magnus Bay areas, where benches occur between the reservoir and the mountainous terrain (Corps 1996b).

The soils are composed primarily of underlying rock types that include decomposed granite and sedimentary materials. In general, the soil layer over the basin is considered thin and underlain by impervious parent rock that contributes to the basin’s high runoff characteristics (Corps 1996a). The most common types of surface soil are sandy loam, loam, and silt loam, with some clay content indicated in each. Because of the natural forest conditions, layers of organic material have accumulated on the soil surface. This soil is mostly acid, ranging from 5.2 parts hydronium (pH) to 6.5. Soil below the surface is low in organic matter but does support moderate to heavy stands of coniferous timber and understory vegetation on Corps lands (Corps 1996a). Refer to Table 3-1 for information on the soils occurring within the Ahsahka Stewardship Project.

All soil types occurring within the stewardship project boundary have low to medium erodibility (k factor is a measure of erodability < 0.45) and are well drained (Table 3-1).

Table 3-1. Ahsahka Project Soils

Soil Name	Acreage	Percent of Total Project	K Factor/Potential Erodability	Drainage Class
Agatha	7	0.41%	0.15	Well Drained
Fordcreek	387	22.29%	0.32	Well Drained
Johnson	760	43.74%	0.24	Well Drained
Klickson	36	2.07%	0.37	Well Drained
Pits, quarry	6	0.36%		
Rock outcrop	504	29.02%		
Uvi	37	2.11%	0.28	Well Drained
Total Acres	1738	100.00%		

3.1.2 Environmental Consequences

3.1.2.1 Alternative A: No Action

This alternative would have no direct effect on soil resources. However, fuel loads would continue to increase raising the potential for indirect effects. Higher fuel loads increase the potential for a stand-replacing fire, which could potentially have a substantial negative effect on soils. A wildfire could potentially remove all vegetation and cause severe erosion. The potential indirect effects to soils and topography are estimated to be moderate due to the improbability of wildfire and current fire suppression management. Other lands within the area are primarily managed intensively for timber resources reducing fuel loads. Cumulatively, higher fuel loading on Corps land should slightly increase overall effects.

3.1.2.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Direct effects to geology and soils associated with this alternative include the potential for soil loss and soil compaction caused by ground-disturbing activities, such as roadwork, development, and use of log landing sites, operation of yarding and skidding equipment, and prescribed burning.

Both new road construction and road reconstruction would directly affect soils. This consists of approximately four miles of new road construction and six miles of road reconstruction. Refer to section 2.3.5.1 for detailed discussion on the proposed roadwork.

The operation of tractors and line skidding equipment within the harvest units themselves would cause some scarring of the substrate and increase the effects of soil loss and compaction. A heavy layer of duff, decaying leaves, branches, needles, etc.,

would afford some initial protection of the substrate on skid trails and landings. Use of helicopters on the steeper slopes would greatly reduce ground disturbance. On slopes of less than 35 percent, ground disturbance and scarification are expected. Direct effects would likely include soil loss and compaction.

Prescribed burning poses the greatest risk of soil erosion associated with this alternative. For ecological reasons, the prescribed burning would primarily be executed in the early fall. If heavy rains follow the burning, some soil erosion would be expected. Based on the above discussions the direct negative effects are considered to be moderate.

Roads utilized for this project are largely existing roads. These are currently in poor condition and will need to be reconstructed. Sliding and sloughing roads have the potential for large-scale soil loss. Reconstruction on these roads may reduce the potential for future road failures. If certain roads are determined to remain as permanent roads, regular maintenance will be done to prevent future road failures. All project landings, roads, and skid trails would be seeded to grass upon completion of the timber sale. Indirect effects are determined to be minor.

3.2 Water Quality

3.2.1 Affected Environment

Dworshak Reservoir is narrow and reaches depths of 600 feet near the forebay area of the dam. Consequently, the lake thermally stratifies every year with a thermocline, the middle layer of water in thermal stratification, at a depth of approximately 40 to 50 feet. Deep-water (below 40 to 50 feet) temperatures remain consistent throughout the year at an approximate 39 degrees Fahrenheit (ºF) [4 degrees Celsius (ºC)] to 41 ºF (5 ºC). The reservoir has been characterized as oligotrophic, which constitutes low productivity and nutrient limited. The oligotrophic characterization of the reservoir indicates exceptional water quality that is low in dissolved solids and devoid of inorganic contaminants (U.S. Department of Energy 1996).

No permanent or serious water quality problems have been observed in Dworshak Reservoir since it was completely filled in 1973. Dworshak is approaching equilibrium as a cold, nutrient-poor lake with high water quality, low watershed nutrient contribution, and lack of point sources of pollution. The reservoir's cooling trend, noted in the post-impoundment study, has apparently stabilized. Oxygen depletion and hydrogen sulfide concentrations in the colder non circulating water, brought about by the decomposition of organics in the first few years after filling, are not expected to reoccur (Corps 1986).

There are several intermittent streams within the stewardship project boundary and no permanent or fish-bearing streams.

3.2.2 Environmental Consequences

3.2.2.1 Alternative A: No Action

This alternative would have no direct effect on water quality. However, fuel loads would continue to increase raising the potential for negative indirect effects. Higher fuel loads increase the potential for stand-replacing fire. If a stand replacing fire was to occur, the result would likely be a major increase in soil erosion and sediment delivery to local streams resulting in negative impacts to water quality. Indirect effects were deemed to be slightly adverse.

If no action is taken, no changes in beneficial or adverse cumulative effects are expected.

3.2.2.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

The primary water quality impact for this alternative would be the potential for increased suspended sediment and turbidity in adjacent streams and the reservoir. The sources of these impacts would be the ground disturbance, soil compaction, and chemical spills.

Direct effects from ground disturbance and soil compaction are expected from the construction and use of roads and landings, the yarding of logs and the construction of fire breaks. The use of various yarding methods as described above would work to minimize new road construction (four miles). Most of the roadwork would involve road reconstruction (six miles). Refer to section 2.3.5.1 for a detailed discussion on proposed roadwork. The potential direct effects to water quality would occur primarily from runoff. Exposed soils have a high potential to be carried to nearby streams during periods of heavy rainfall. Further, replacement of culverts and installation of new culverts and fords in the streams would likely result in temporary, minor increases in turbidity. Fifteen new culverts would be installed. None of these culverts would be installed at water crossings.

The use of tractors and line machines to yard logs to the landings is expected to cause substantial ground disturbance and soil compaction. Firebreak construction as well would cause ground disturbance. Ground disturbance from all of these sources would act to increase the sediment delivery to streams.

The likelihood and magnitude of the potential impacts would be greater in the short term, following the actual operation during periods of heavy precipitation or snowmelt. Increases in suspended sediment and turbidity would most likely occur briefly, in association with summer rainstorms, and probably be confined to a relatively small

area. Sediment delivery to streams through runoff is greatly contributive to the soil characteristics. The soil types found within the project boundary should significantly reduce the potential impacts to water quality.

In addition to sediment-related impacts, this alternative would have the potential to introduce contaminants to the affected streams and reservoir. The primary mechanism for this type of impact would be accidental spills of fuel or similar toxic products from heavy equipment. Spill prevention and control plans would be required by contractual terms of the timber sale. The plans would include items such as identifying fueling locations, specifying leak proof containers, construction of impervious containment dikes, and cleanup procedures. Compliance with such plans would reduce the possibility of spills to very low levels.

Based on the above discussions and best management practices detailed in Section 2.5, direct effects are minor.

Indirect effects could result from vegetation removal and future road failures. Tree removal, through timber harvest, and vegetation removal, through prescribed burning, would change the water absorption and runoff values of the slopes where timber removal or burning is prescribed. Because trees are being selectively removed and no large, open areas are being created, natural re-vegetation would occur within two growing seasons. Ground vegetation would reestablish following the burn within one growing season. No adverse long-term water quality impacts are expected from vegetation removal.

Subsequent to project completion, all roads and skid trails would be water barred and grass seeded to reduce the potential for erosion. This alternative would also repair a majority of the existing roads within the project boundary for use in the harvest operation. This should greatly reduce the potential for future road failures and subsequent water quality impacts provided regular road maintenance is instituted. Corps regulations allow public motorized use on designated roads only. No additional roads would be designated for public motorized use as a result of this action. To minimize erosion as a result of unauthorized motor vehicle use, physical barriers would be utilized during and after the project. Culverts being installed as a result of this action would remain in place and be maintained. Indirect effects to water quality with this alternative are considered minor.

Potential cumulative effects are both spatial and temporal in nature. Some residential development continues to occur within the watershed and adjacent to Dworshak lands. These actions may have minor water quality effects within the subwatershed. The water quality of the reservoir is also affected by adjacent landowner actions and the current project. However, in comparison, the current management of Dworshak water

reserves has a much greater negative effect on water quality than the proposed projects and adjacent land management. Flow augmentation required under NMFS' Federal Columbia River Power System (FCRPS) Biological Opinion (NMFS 2010) to enhance downstream conditions for endangered salmon migration result in dramatic drawdowns (80 to 155 feet), exposing up to 200 feet of mineral soil around the perimeter of the 54-mile reservoir for most of the year. This creates potential for high levels of erosion and sedimentation. In comparison, impacts to water quality resulting from this project would be negligible. Cumulative effects are determined to be minor.

3.3 Air Quality

3.3.1 Affected Environment

The Aleutian Low and Pacific High weather patterns strongly influence local climates. The Pacific High dominates during the summer months, resulting in hot and dry weather. Locally, all major river canyons are subject to temperature inversions that can pool smoke in drainage bottoms. Air quality, in the analysis area, is predominantly rated "good" and meets guidelines established by Idaho air quality laws and the Clean Air Act (CAA) (Corps 1997).

Periodically, air quality may be degraded and minor amounts of pollutants may occur from the following: (1) wildfires; (2) prescribed burning; (3) internal combustion engines; and (4) dust from road use. Activities that affect air quality are generally of short duration, lasting from one day to several weeks.

3.3.2 Environmental Consequences

3.3.2.1 Alternative A: No Action

This alternative would have no direct or cumulative effects on air quality. However, higher fuel loads increase the potential for a stand-replacing fire, which could potentially have a negative indirect effect on air quality.

3.3.2.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Direct effects to air quality would come from smoke and ash generated during prescribed burning and debris burning at landings, dust from the road surface during hauling activities, and emissions from operating equipment. Impacts from burning would last one to five days and be short term in nature. Idaho has developed air quality standards and a smoke management plan for northern Idaho. Large prescribed fire activities would conform to the standards of the Northern Idaho Airshed Group. Impacts resulting from road use (dust) would likely occur during the timber removal operation, depending on weather. However, only minor, short-term impacts to air quality are

expected to occur. If dust becomes a problem, the contractor should be prepared to water the roads to minimize dust. Direct effects are considered to be minor. There are no perceived indirect or cumulative effects expected.

3.4 Resident Fish and Aquatic Ecology

3.4.1 Affected Environment

Dworshak Reservoir is a deep, oligotrophic storage reservoir with a steep-sided shoreline (Corps 1982). The reservoir stratifies during the summer, providing warm-water habitat on the surface layer and cold water at depth (Corps 1982). Dissolved oxygen is typically sufficient to support fish populations. Most phytoplankton and zooplankton production occurs in the epilimnion, the upper layer of a stratified lake, which generally extends over the upper 40 feet of the reservoir. Flow augmentation required under NMFS' FCRPS Biological opinion (NMFS 2010) to enhance downstream conditions for endangered salmon migration does result in dramatic drawdown (80 to 155 feet), exposing up to 200 feet of mineral soil around the perimeter of the 54-mile reservoir for most of the year. Because of the extensive variation in water surface elevation and contained wave action, aquatic macrophytes are virtually nonexistent along the shoreline and benthic production is low (Corps 1992). Within the Stewardship project boundary, there are several intermittent streams and no permanent or fish-bearing streams.

3.4.2 Fisheries

Twenty one fish species inhabit Dworshak Reservoir (Maiolie et al. 1993). Primary sport species present in the reservoir include kokanee, rainbow trout, smallmouth bass, largemouth bass, cutthroat trout, brook trout, mountain whitefish, crappie, and brown bullhead (Maiolie 1988). Because of the steep shorelines and drastic fluctuations in pool level, little shallow water habitat is available to support natural reproduction of smallmouth bass. Maximum shoreline spawning habitat exists at full pool. Cutthroat and rainbow trout spawn in the tributaries in the spring. Bull trout and kokanee spawn in the fall primarily in the tributaries to the reservoir (Maiolie 1988). It is presumed that mountain whitefish also spawn in the streams or in the North Fork Clearwater River upstream of the reservoir. See Table 3-2 for a list of fish species inhabiting Dworshak Reservoir.

Table 3-2. Fish of Dworshak Reservoir

Common Name	Scientific Name
Chiselmouth	Acrocheilus alutaceus
Bridgelip sucker	Catostomus columbianus
Largescale sucker	Catostomus macrocheilus
Sculpin	Cottus spp.
Northern pike	Esox lucius
Pacific lamprey	Entosphenus tridentatus
Brown bullhead	Ictalurus nebulosus
Pumpkinseed	Lepomis gibbosus
Smallmouth bass	Micropterus dolomieui
Largemouth bass	Micropterus salmoides
Kokanee	Oncorhynchus nerka
Black crappie	Pomoxis nigromaculatus
Mountain whitefish	Prosopium williamsoni
Northern pike minnow	Ptychocheilus oregonensis
Longnose dace	Rhinichthys cataractae
Speckled dace	Rhinichthys osculus
Redside shiner	Richardsonius balteatus
Cutthroat trout	Onocorhynchus clarki
Rainbow trout	Onocorhynchus mykiss
Bull trout	Salvelinus confluentus
Brook trout	Salvelinus fontinalis

Source: Horton, W. D., 1980.

The distribution and abundance of westslope cutthroat trout has declined throughout its former range since the late 1800s (Liknes and Graham 1988). The decline of cutthroat trout has been attributed to overfishing, genetic introgression, competition with nonnative species (especially stocked rainbow trout), and habitat destruction. As a result of recent study findings, indicating that many healthy populations still exist and thrive in Idaho waters, the USFWS denied listing the westslope cutthroat. The species is listed as a sensitive species by the Idaho Department of Fish and Game. Westslope cutthroat occurs in the reservoir and spawns in larger tributaries. It has been documented to occur in the following creeks feeding Dworshak Reservoir; Long Meadow, Elk, Cranberry, Swamp, Weitas, Gold, Benton, Little North Fork of the Clearwater, Breakfast, and North Forth of the Clearwater (Clearwater Subbasin; www.StreamNet.org). Source: Maiolie, M.A.; D.P. Statler; and S. Elam 1993.

3.4.3 Environmental Consequences

3.4.3.1 Alternative A: No Action

This alternative would have no direct effect on resident fish and/or aquatic resources. However, fuel loads would continue to increase. Higher fuel loads increase the potential for a stand-replacing fire, which could potentially increase erosion and, therefore, have a negative indirect effect on aquatic resources. Cumulative effects are not considered as no management action is planned.

3.4.3.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Impacts to fish and other aquatic organisms would occur primarily as a result of negative water quality impacts. Water quality impacts were expected to be insignificant (Section 3.2.2.2). Therefore, significant direct, indirect, and cumulative effects from this alternative to fish and other aquatic organisms are not anticipated. Given best management practices planned for this project (Section 2.5), impacts to fish and other aquatic organisms would be short-term and moderate, but would be reduced with minor controls established in the BMPs.

3.5 Terrestrial Environment

The Idaho Department of Fish and Game (IDFG) conducted a terrestrial resources inventory on Corps-managed lands around Dworshak in 2000 and 2001. Its primary purpose was to provide information regarding terrestrial resources such as fungi, vascular plants, bryophytes, lichens, and wildlife.

Fungi surveys were subcontracted to Oregon State University. A total of 570 fungi specimens were collected; 381 collections were identified for a total of 163 species. Included among these are 14 previously undescribed and/or Survey and Manage species (Bowers and Nadeau 2002).

Plant surveys were conducted by IDFG and included in the Idaho Conservation Data Center database. A total of 450 vascular plant species, 126 bryophyte species, and 84 lichen species were found in the Dworshak Study Area (DSA). Of these, 13 rare vascular plant species, 6 rare bryophyte species, and 12 rare lichen species were documented (Bowers and Nadeau 2002).

The IDFG performed wildlife surveys in the DSA. A total of 204 wildlife species and 4 domestic species were observed in the DSA. Of these, 16 species with Idaho and/or Federal special status were detected, including the Coeur d'Alene salamander, western toad, Columbia spotted frog, northern alligator lizard, common loon, American White pelican, trumpeter swan, harlequin duck, northern goshawk, flammulated owl, northern

pygmy owl, pygmy nuthatch, Yuma myotis, long-eared myotis, California myotis, and Townsend's big-eared bat (Bowers and Nadeau 2002). A list of all wildlife species occurring or having the potential to occur on Dworshak Reservoir can be found in Appendix D.

3.5.1 Vegetation

Potential impacts of timber removal on vegetation, wildlife, and threatened and endangered species are discussed in this section. In general, direct negative impacts from the proposed action are anticipated to be minor and insignificant.

3.5.1.1 Affected Environment

Current Vegetation Condition

The project vegetation includes a mix of cover types influenced by soil types, topography, climate, past management practices, and ecosystem processes. Fourteen major cover types are found on the lands that surround the reservoir. The identified species include 35 grasses, 17 grass-like plants, 270 forbs, 45 shrubs, and 21 trees (Corps 1975b). Drier plants are found in the downstream end of the pool (near the dam), while hydrophytic (wetter) types are increasingly encountered farther up the pool.

The proposed project area is located in close proximity of Dworshak Dam. The Land-Type Association is Breaklands. The spatial composition of the vegetation occurs in response to moisture and temperature regimes within the geophysical mosaic of the landscape. As a result, breaklands within the described region often exhibit a wide variety of habitat types within the landscape. Based on forest inventories, four habitat types occur within the project boundary; ponderosa pine (Pinus ponderosa)/snowberry (Symphoricarpos albus), ponderosa pine/wheatgrass (Elytrigia elongate), Douglas-fir (Pseudotsuga menziesii)/ninebark (Physocarpus malvaceus) and grand fir (Abies grandis)/ninebark.

Ponderosa pine habitat types occur on the drier south aspects. These stands are predominately dense stands of young to mid-age pines with pockets of large, mature pines. Competition from smaller pines are causing the mature pines to exhibit stress. Understory is characterized by native grasses. Ground cover within these stands generally consists of a thick pine needle mat with pockets of brush.

Douglas fir/grand fir habitat types consist primarily of dense stands of young to mid-age Douglas fir and ponderosa pine trees with a small amount of grand fir. Understory consists of less palatable browse species (ocean spray, ninebark & serviceberry) and pinegrass.

Sensitive Plants: The Idaho Conservation Data Center (CDC) conducted sensitive plant surveys within the project boundary in the summer of 2004 focusing efforts on locating Jessica's aster. They documented the occurrence of three state-listed plants; broad-fruit mariposa, Palouse thistle and Jessica's aster and one lichen (*Hypogymnia inactiva*) and one moss(*Tripterocladium leucocladulum*). (Bowers and Nadeau 2002).

3.5.1.2 Environmental Consequences

Alternative A: No Action

No direct effects would occur under this alternative. Indirect effects could be substantially adverse. The health of early seral plants would continue to deteriorate as encroaching, more shade-tolerant species absorb a larger share of the available nutrients, sunlight, and water. Fuel loading and the potential for large-scale wildfires would increase with time. Current fire suppression activities greatly reduce the probability of large-scale wildfire. However, fuel loading would continue to increase and eventually overcome the ability of fire suppression to effectively protect the area from stand-replacing fire. Stand-replacing fire would negatively alter the species composition, form, and structure for decades. Understory vegetation would also continue to become increasingly more decadent and unavailable to foraging big game. Under the "No Action" Alternative, natural habitats historically dominated by early seral species and associated wildlife would continue to degrade. The indirect effects are determined to be negative but manageable.

Cumulatively this condition, coupled with adjacent land management activities focused on timber production, would likely result in the continued increase in potential for stand-replacing fires. Further, habitat would become less suitable for select native wildlife species. These effects are considered moderately adverse.

Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

This alternative could result in the selective harvest of up to 5.3 million board feet of lumber. This removal and the subsequent prescribed burn would change the amount, condition, spatial arrangement, structure, and linkage of vegetation patches. Negative direct effects would include the short-term loss of some shrub and ground cover. However, these effects are short-term in nature and are considered minor.

All proposed actions are designed to restore the current vegetative communities to more historically natural conditions. Using multiple yarding methods allows for greater flexibility in meeting the project objectives. Further fire breaks created by equipment allows for more intensive prescribed burning maximizing ground fuel reduction among other project benefits. Therefore, the indirect effects to the current vegetation are considered to be greatly beneficial.

Fire suppression has played a major role in bringing about the current vegetative conditions observed on the site today. Ponderosa pine requires disturbance resulting in a bare mineral soil to propagate. Thus, the thick mat of needles on the forest floor is in all probability resulting in the lack of pine regeneration. Wildfire has the potential to effectively remove the ground cover leaving a bare mineral soil. Other forest health issues, such as beetle infestation, root rot, disease, and a general lack of tree vigor (low crown-to-height ratios) are suggestive that stands are overstocked. Wildfire has the potential to thin overstocked stands, reducing competition, and restoring forest health.

The CDC does not anticipate significant adverse impacts to the sensitive plants identified by the CDC (Bowers and Nadeau 2002).

Off project activities would add little to the cumulative benefit effects associated with this project. Objectives among landowners vary greatly and changes to vegetation as a result of this alternative would provide habitat for different groups of species. This effort would actually broaden the species utilization of the habitats present. Cumulative effects are considered to have some benefit.

3.5.2 Wildlife

The various habitat types found along Dworshak Reservoir provide for a multitude of wildlife species. Most endemic wildlife species are present. The Idaho Department of Fish and Game conducted terrestrial resource inventories in 2000 and 2001 and documented three rare wildlife species within the project boundary; pygmy nuthatch, California myotis and bald eagle.

Although numerous mammalian species have the potential to exist within the project area, the following discussions and the associated species listed would address species documented within close proximity to the project site.

3.5.2.1 Affected Environment

Mammals

Big Game: Although bighorn sheep (Ovis canadensis), and mountain goat (Oreamnos americanus) have been observed infrequently on Corps lands, moose (Alces alces), white-tailed deer (Odocoilius virginianus), Rocky Mountian elk (Cervus elaphus), and American black bear (Ursus americanus) regularly dwell on Dworshak lands.

The reservoir, when originally filled to its maximum elevation (1,600 feet msl), flooded 19,090 acres of big game winter range. Efforts to mitigate for the lost habitat have primarily focused on the replacement of elk winter range. While wildfires on Corps lands are suppressed, harvest and prescribed burning have been an important and well-accepted technique for developing high quality browse. Many acres have already been

manipulated by harvest and burning to replace browse lost. Even though past management efforts have concentrated on the needs of wintering elk, the lands around Dworshak are also important for a variety of big game.

Big game populations around Dworshak are affected by on and offsite logging activities and recreation activities. Enhanced hunter access into big game habitat following the establishment of logging roads has substantially affected elk populations and, to lesser degrees, black bear and deer populations. Although non-hunting recreation activities are normally limited to the summer months, calving and fawning areas are sometimes degraded by human intrusion during the spring (Asherin and Orme 1978). The lands surrounding Dworshak provide important big game winter range and become increasingly important as winter conditions worsen.

Furbearers and Carnivores: Aquatic furbearers on Dworshak lands include beaver (Castor canadensis), American mink (Mustela vison), and river otter (Lutra canadensis). The use of the reservoir by these species is limited because of the extreme water level fluctuations during the fall and spring. Terrestrial furbearers include striped skunk (Mephitis mephitis), short-tailed weasel (Mustela erminea), coyote (Canis latrans), bobcat (Felis rufus), badger (Meles meles), and raccoon (Procyon lotor) (Asherin and Orme 1978). Eleven species of furbearers and carnivores were detected during the IDFG study, including coyote (Canis latrans), wolf (Canis lupus), red fox, black bear (Ursus americanus), raccoon (Procyon lotor), pine marten (Mustela americana), short-tailed weasel (Mustela erminea), striped skunk (Mephitis mephitis), northern river otter (Lutra canadensis), mountain lion (Felis concolor), and bobcat (Felis rufus) (Bowers and Nadeau 2002).

Studies conducted by Asherin and Orme (1978) indicate a high potential for beaver, mink, striped skunk, and coyote to occur within the project area. Other species may occur but are less likely to occur.

Small Mammals: Asherin and Orme (1978) trapped 20 species of small mammals, representing eight families along Dworshak Reservoir. The deer mouse (Peromyscus maniculatus) was the most common small mammal encountered. Vegetative communities with the most diverse populations of small mammals were bracken fern/orchard grass-timothy (8 species), Douglas fir/serviceberry-common snowberry (9 species), and western red cedar/maidenhair fern (11 species). Asherin and Orme (1978) also reported six species of bats along the reservoir, with the little brown bat (Myotis lucifugus) occurring most abundantly.

Within the stewardship project boundary, big brown bat, little brown bat, Townsend's big-eared bat, California myotis, yellowpine chipmunk and yellow-belied marmot were documented by IDFG.

Birds

Landbirds: The lands surrounding Dworshak support numerous songbirds and other birds throughout the structurally diverse habitats, which have been created both by natural succession and by management actions.

Landbird surveys have been conducted 11 times within the project boundary since 2000. One species observed in the stewardship project boundary currently has special status in Idaho, the pygmy nuthatch.

Raptors: Forest-dwelling hawks and owls are well represented on Dworshak lands. Habitat preferences among various species are evident in 1976-77 data from Asherin and Orme (1978). Species that nest in multi-layered habitats include great horned owl (Bubo virginianus), northern pygmy-owl (Glaucidium gnoma), western screech owl (Otus kennicottii), sharp-shinned hawk (Accipiter striatus), Cooper's hawk (Accipier cooperii), red-tailed hawk (Buteo jamaicensis), and American kestrel (Falco sparverius). Barred owls (Strix varia) and northern goshawks (Accipiter gentilis) nest primarily in mature timber with less understory. Osprey (Pandion haliaetusare) are summer residents at Dworshak and have been increasing in number since the reservoir was filled in 1973. During a 1994 osprey nest survey, 160 nests were counted along Dworshak Reservoir.

The bald eagle (Haliaeetus leucocephalus), primarily a winter resident, is of ecological and cultural importance at Dworshak Reservoir. Bald eagles can be found throughout the project area during most winters. However, winter use of the reservoir varies greatly based on food availability and weather conditions. They feed primarily on deer and elk carrion and on fish in the open water. There are no known perch sites or roost sites habitually used by eagles above the dam. Prior to 1999, no eagle nests had been documented within the Clearwater River drainage. However, a bald eagle nest was discovered in 1999 near Cold Springs campground on Dworshak Reservoir. A pair of eagles attempted nesting in this location in 1999 and 2000. Both nest attempts failed and the nests were abandoned prior to hatching. Finally, in 2004 an eagle nest produced offspring near Benton Butte. Later in 2005, the Cold Springs nest site produced young as well. Today there are three documented bald eagle nests on the reservoir. One is located within the stewardship project boundary.

All known raptor nests would be monitored each year to determine active status. Best Management Practices established to reduce adverse affects to nesting raptors are described in section 2.5.4. Additionally a Corps Biologist would periodically monitor the effects of the project activities on the nesting bald eagles. Additional buffers may be instituted if necessary to ensure that the project activities are not disturbing the nesting eagles.

Waterfowl: A total of 33 waterfowl species have been observed on Dworshak Reservoir. Waterfowl primarily use the reservoir during their spring and fall migratory periods as a resting area. Peak waterfowl use occurs during late fall, winter, and spring. Some feeding by geese and puddle ducks occurs along the exposed shoreline during the reservoir drawdown. Extreme fluctuations in the pool level limit the growth of aquatic vegetation, thereby, reducing the amount of available food and potential nesting habitat. Three duck species are known to nest along the reservoir: mallard (Anas platyrhynchos), wood duck (Aix sponsa), and common merganser (Mergus merganser).

Upland Game Birds: Ruffed grouse (Bonasa umbellus), the major upland game species on Dworshak lands, inhabit all vegetative communities along the reservoir. However, the highest grouse numbers are found in communities with a multi-layer structure and substantial ground cover. The highest counts of drumming males were obtained in the Douglas fir/serviceberry/snowberry and mixed conifer communities. Other species of minor importance along the reservoir include blue grouse (Dendragapus obscurus), spruce grouse (Dendragapus canadensis), mountain quail (Oreortyx pictus), California quail (Callipepla californica), wild turkey (Meleagris gallopavo), and gray partridge (Perdix perdix) (Asherin and Orme 1978).

3.5.2.2 Environmental Consequences

Alternative A: No Action

No direct effects are expected with this alternative. However, the “No Action” Alternative would allow the continued degradation of current site conditions increasing the potential for negative indirect effects. The current vegetative composition, form, and structure provides habitat for a variety of wildlife species but does not ensure healthy native species. The primary effect of this natural ecosystem process would not be achieved. Thus, regional populations of the sensitive wildlife species that use and/or require the habitat characteristics associated with expected conditions would not benefit and continue to decline. These include the white-headed woodpecker, flammulated owl, and pigmy nuthatch. If habitat restoration efforts were not accomplished regionally, these species could become scarce. Indirect effects to native wildlife populations with this alternative are determined to be somewhat adverse, but manageable.

The primary emphasis of adjacent land management actions is upon timber production and less toward wildlife habitat development. Negative cumulative effects would increase with implementation of this alternative and would be considered moderately adverse.

Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Direct effects from this alternative are considered minor. The use of heavy equipment (e.g., tractors, line machines, chain saws, trucks, log trucks and helicopters) and prescribed fire would likely cause the immediate displacement of wildlife. The wildlife near the work sites, as well as the transportation routes, would be subjected to increased disturbance and may relocate into other areas. Prescribed fire would also displace wildlife. Displaced wildlife would have to compete with others in the population for remaining or adjacent habitat. These actions would be localized and for a limited duration. The use of tractors and trucks would be expected to impact ground-dwelling species.

Short-term (< 5 years) impacts to wildlife habitat would occur primarily from removal of vegetation. Ground disturbing activities, such as the construction of temporary roads and landing areas, and prescribed fire would result in the temporary reduction of available forage. This again would increase competition for existing resources offsite. Some wildlife (such as whitetail deer and elk) would be impacted for a short duration (2-3 years) while forage regrows. As re-vegetation occurs, wildlife populations would adjust to accommodate the new carrying capacity of the habitat.

Indirect effects from long-term changes in vegetation would be expected to greatly benefit all native terrestrial species that have evolved to utilize the expected forest conditions. Changes in forest composition, form, and structure would cause long-term adjustments in wildlife use. The habitat suitability for a variety of species currently inhabiting the area would decrease while the habitat suitability for the target species would increase. Many native species (e.g., white-headed woodpeckers and flammulated owls) dependent on ponderosa pine cover types (i.e., late seral ponderosa pine) are now scarce or absent within the region. By emulating forest thinning and fire to restore the composition, form and structure of ponderosa pine ecosystems, these species would benefit. Whereas, species associated with dense stands of Douglas fir and mixed conifers, which are unnatural for the project area, would experience a loss of habitat. The proposed change in species composition, form, and structure is deemed a major beneficial effect to terrestrial species. This trade-off is considered favorable for native wildlife species and substantiates negative short-term impacts.

Many big game species heavily use the understory browse component of Douglas fir and ponderosa pine forests. The historical fire regime ensured that particular species of plants (notably redstem ceanothus, serviceberry, scouler willow, and mountain maple) occur commonly. These shrubs typically exist as single bushes or clumps amidst grass and forb dominated openings on south-facing slopes intermixed with forest patches of late mid-seral, mature, and old uneven age stands. Shrub communities provide important forage for a variety of wildlife, while the forested patches offer thermal and

security cover. Forage available in the first several years after the harvest would increase for elk and deer. As a result of this project, long-term benefits to big game should greatly outweigh short-term losses. The remaining trees and buffer zones would continue to provide adequate thermal and hiding cover values for elk and deer. To minimize disturbance to elk and deer, new road construction would be minimal and improved roads would be closed to motorized travel after project completion. Long-term project impacts are considered beneficial to big game.

A diversity of snags, dying green trees, and live trees create habitat and microhabitats for cavity nesting and insect feeding wildlife species. The various insect species attracted to the abundance of dead and dying trees provide an increase in food supply for insectivorous feeding wildlife. Therefore, even though the retention of four snags per acre as nesting habitat is adequate to support cavity nesting bird species, all dead standing trees would be left intact unless they present a safety hazard. Maintaining current snag densities while leaving dominant and co-dominant trees, representing snag replacement trees, would minimize the impacts to these species. It is assumed a small percentage of live trees would be burned, and would die because of the prescribed burns creating additional snags.

Raptors use the reservoir for nesting and breeding. The last osprey breeding survey conducted on the reservoir (1994) documented 160 existing nests. Only three bald eagle nests are currently documented on Dworshak Reservoir. Eight existing osprey nests and one bald eagle nest occur within the stewardship project boundary. The active status of these nests is determined annually. Due to the large number of osprey nests and breeding pairs, it is highly unlikely that impacts to these nest sites would adversely affect the population as a whole. Nest site protection measures presented in section 2.5.4 would likely be enough to adequately reduce disturbance to either bald eagle or osprey nesting.

The proposed alternative is expected to restore forest conditions within lower montane forests within the project area. Although minimal short-term negative effects are expected, the long-term effects would greatly benefit native wildlife species. Wildlife surveying would be done to monitor changes in wildlife habitat utilization. Refer to section 2.5.5 for detailed information on wildlife monitoring. Indirect effects from this alternative on wildlife are considered overall to be beneficial.

Changes in wildlife habitat associated with this project would not add cumulatively to past or future changes on adjacent land. Objectives among landowners vary greatly and changes to habitat as a result of this alternative would provide habitat for different groups of species. This effort would actually broaden the species utilization of the habitats present. Cumulative effects are considered moderately beneficial.

3.6 Recreation

3.6.1 Affected Environment

Dworshak is the only large reservoir with a forested shoreline found within a 100-mile radius of Orofino, Idaho. It is an important regional recreation resource for eastern Washington and central Idaho. Because of the remote nature of the North Fork, there is limited road access and development has been minimal. The most popular activities include boat-in camping, boating, water-skiing, fishing, hunting, and hiking. Facilities include seven boat launch sites, two developed Class “A” full service campgrounds, two primitive campgrounds, a marina, and over 80 boat-accessible mini-camps. Annual visitation to the reservoir is approximately 150,000.

Within the new Dworshak Public Use Plan (2011) Land Use Classifications have been revised. The stewardship project boundary includes five different land use classifications; Environmentally Sensitive, Project Operations, Multiple Resource Management (MRM)–Wildlife Management, MRM–Low Density Recreation and MRM–Future Recreation. The purpose and need for this project best identifies with objectives within the Environmentally Sensitive and MRM-Wildlife land use classifications. Only small portions of the other three land use classifications occur within the project area. There is only one existing recreation facility, Merry’s Bay Day Use Area, which is classified within the MRM-Low Density Recreation classification. There is also a well used public trail along the Ahsahka Hillside.

Corps regulations allow public motorized use on designated roads only. No additional roads will be designated for motor vehicle use associated with this project. However, some access from adjacent lands is gained through unauthorized motor vehicle use, which is a minor problem in the area. The installation of physical barriers will reduce unauthorized motor vehicle use.

3.6.2 Environmental Consequences

3.6.2.1 Alternative A: No Action

With this alternative, recreational use would not be changed. The Merry’s Bay Day Use Area would remain as the only recreation facilities and minor unauthorized motor vehicle use would continue. No direct, indirect, or cumulative effects are expected with this alternative.

3.6.2.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Direct effects to recreation are considered to be minor. The recreating public may experience minor disturbances associated with heavy equipment use including trucks, tractors, chain saws, and helicopters. This disturbance would be short-term. Under this alternative, most of the heavy equipment operation would occur in tractor yarding units and be within closer proximity of recreational users than other alternatives. In addition, increased logging truck traffic within the project boundary would cause additional dust and potentially increase the impact to area users. Smoke from prescribed burning would also impact recreation short term. Safety and increases in noise and dust are the primary concerns. News and radio releases would be used to alert the public to the hazards associated with recreating within the area while the project is ongoing. The limited magnitude and duration of the operation would have limited impacts on the overall reservoir area.

Indirect effects could be beneficial as the development of increased browse vegetation in the harvest areas may increase the deer and elk numbers. The minor increases in populations of these species may increase the number of hunters and the number of wildlife harvested at the project. Increased wildlife numbers also provide more opportunities for wildlife viewing. The magnitude of increased use and its indirect effects is not expected to be so great or geographically concentrated that significant user-related problems would occur.

No additional roads would be designated for public motorized use as a result of this action. To minimize unauthorized motor vehicle use, physical barriers would be utilized during and after the project. However, some of these roads may be considered for future public motorized access. No cumulative effects are expected

3.7 Aesthetics

3.7.1 Affected Environment

The Corps' visitation records indicate sightseeing is the primary motivation for visiting Dworshak. Dworshak, located 1.5 miles upstream from the mouth of the North Fork Clearwater Canyon, impounds a 54-mile long reservoir. When full, the reservoir created by the dam is enhanced by 184 miles of scenic shoreline winding through the timbered canyons of the western slopes of the Bitterroot Mountain Range (Corps 1996a). Over 100 mini-camps were placed along the shoreline to blend in with the landscape. Scenic natural meadows, mixed conifers, openings, brush fields along with logging roads, and burned and logged areas (both on Dworshak land and on adjacent property) are visible from the reservoir.

3.7.2 Environmental Consequences

3.7.2.1 Alternative A: No Action

Direct effects on aesthetics are not likely given this alternative. A lack of forest management may result in increased beetle infestation and disease resulting in more dead and dying trees. This added fuel may result in a stand-replacing fire, which would impact aesthetics. Over time, most of the forest openings would close in and convert to forests. Therefore, little to no indirect effects is expected as well. No management action is considered to not add to cumulative effects.

3.7.2.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

The amount, size, and distribution of trees being retained should act to buffer disturbed ground from the recreating public reducing direct effects. As compared to clear-cuts and seed-tree cuts, the selective retention of large diameter trees prescribed here would greatly reduce the visibility of disturbed ground. Tractor yarding completed within the Little Bay Stewardship Project, with similar selective harvest, is not visible from the reservoir (personal comment Russ Davis, Wildlife Biologist, Dworshak Reservoir).

Additional potential direct effects would include the blackened appearance of the soil surface and a lack of ground vegetation, following the prescribed burn. The short-term adverse effects are expected to occur for approximately one year following the burn. Visible disturbed areas, such as exposed landings, would be seeded to native grasses to speed rehabilitation. Mitigating measures would include providing buffer zones along the reservoir, perennial streams and mini-camps; locating landing sites outside of view of the reservoir; minimizing development of new roads; and using best management practices to control erosion damage. Revegetation is likely to begin to reduce visual effects from project activities within six months and nearly eliminate them within a year. The long-term effects are anticipated to be beneficial. The proposed work would remove insect-infested trees, reduce stand density, and create open areas resulting in a “park-like” setting.

Public relations tools would be used to inform the public of the benefits of the project. This may involve informational displays at high-use mini-camps within the project boundary, displays at the visitor’s center, and the use of public media.

Indirect effects would be reduced as time goes on. Direct, indirect, and cumulative effects are considered insignificant.

3.8 Cultural Resources

3.8.1 Affected Environment

The archaeological record indicates the continuous human habitation of the Dworshak area for the past 10,000 years (Ames 1980). The subsistence pattern of the prehistoric inhabitants of the Clearwater Valley was based on a hunting, fishing, and gathering economy. Stable use of the resources is reflected through time, with slightly greater dependence on fishing and processing of plant foods reflected in the tool assemblages of the last few millennia (Mattson et al. 1982). Many of the archaeological resources at Dworshak are closely related to Nez Perce culture as the Clearwater River and its tributaries have been used by the Nez Perce Tribe since prehistoric times. The Euro-American presence in the area began with Lewis and Clark's journey through Orofino in 1805 and continues to the present day.

There are 469 recorded archaeological sites on lands associated with Dworshak Dam and Reservoir. Of this total, 214 are prehistoric, 15 historic, and 40 are multi-component sites containing both historic and prehistoric remains. None of the resources have been formally evaluated for National Register of Historic Place (NRHP) eligibility, so until that process is complete all sites are considered eligible for listing on the NRHP.

3.8.2 Environmental Consequences

3.8.2.1 Alternative A: No Action

This alternative would not include any ground disturbance and, therefore no cultural resources would be impacted.

3.8.2.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Cultural resource surveys did not identify any historic properties within the proposed project area; therefore the undertaking should not result in adverse effects. However, every excavation or other ground disturbing activity has the potential for revealing previously unrecorded archaeological sites. In the event of a possible inadvertent discovery all work must cease within the vicinity of the find. The site should be stabilized as much as possible without causing any further damage, and the Corps District Archaeologist should be notified within 48 hours. The District Archaeologist or his/her representative will visit the site as soon as possible and issue further guidance.

If the material uncovered is determined to not be cultural in nature the District Archaeologist or his/her representative may authorize continuation of the work. However, if the material is determined to be of cultural origin then additional consultation may be necessary before work within the discovery area can proceed.

3.9 Threatened and Endangered Species

3.9.1 Affected Environment

Five threatened and/or endangered species were identified as having the potential to be affected by the Ahsahka Stewardship Project: Canada lynx, gray wolf, bull trout, fall Chinook salmon, and steelhead. Detailed information regarding the potential impacts to these species and the measures to protect their habitat are presented in the Biological Assessment in Appendix E.

3.9.1.1 Canada Lynx

Lynx typically occur above 3,750 feet in elevation. The highest elevation within the Ahsahka project boundary is 2,680 feet. Also, no lynx have been documented on Dworshak Reservoir. (However, lynx have been documented in two locations north of Breakfast Creek, one on the Floodwood Road in 1997 and once at Stocking Meadows Ridge in 1998 (Corps 2006)-from BA). No lynx and/or lynx habitat is expected within the project boundary, therefore, no environmental consequences are expected to Canada Lynx from any and all alternatives and will not be discussed in the following section.

3.9.1.2 Gray Wolf (Canis lupus)

Until May 5, 2011, the gray wolf was listed as an experimental nonessential population in north central Idaho. Wolves have reestablished in the Clearwater River Basin. There are no known wolf packs in and around the project boundary. The Chesimia Pack is the closest documented pack. If wolves are sighted within the project boundary, a Corps biologist would monitor project activities to document disturbance to wolves. If wolves are being disturbed, the USFWS will be contacted for direction. This action would be taken in all action alternatives.

3.9.1.3 Bull Trout (Salvelinus confluentus)

The Dworshak Reservoir has an isolated subpopulation of migratory bull trout. This subpopulation spends most of the winter, spring, and early summer months in the reservoir. Adults leave the reservoir from August to November to spawn in larger tributaries of the reservoir. Dworshak Reservoir and several tributaries have recently been designated as critical habitat for bull trout. Further, no bull trout spawning is known or likely to occur within the Ahsahka project boundary.

3.9.1.4 Fall Chinook Salmon (Oncorhynchus tshawytscha)

Dworshak Dam built on the North Fork of the Clearwater River in the 1970s permanently prevented upstream fish passage. As a result, no anadromous fish species currently occur on Dworshak Reservoir or within any of its tributaries. Fall Chinook salmon occur in the mainstem of the Clearwater River and in the North Fork Clearwater River below Dworshak Dam. It appears that the area is used as primary spawning and rearing by fall Chinook. Both of these reaches are designated as critical habitat for fall Chinook.

3.9.1.5 Steelhead (Oncorhynchus mykiss)

Steelhead occur in the mainstem of the Clearwater River and in the North Fork Clearwater River below Dworshak Dam. It appears that the area is used as primary spawning and rearing habitat by steelhead. The Clearwater River in the vicinity is designated as critical habitat for steelhead.

3.9.2 Environmental Consequences

3.9.2.1 Gray Wolf

Alternative A: No Action

No significant direct effects are expected to gray wolves and/or their habitats given the No Action Alternative. However, continued increase in tree densities and canopy closure resulting from no action would reduce the habitat quality for the prey of gray wolf (deer and elk) resulting in some negative indirect effects. Cumulative effects are not expected given no management action. The impact to the gray wolf is considered insignificant.

Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Direct effects to wolves from logging and burning could affect distribution of wolves in the localized area. The temporary displacement of wolves is considered insignificant. Based on the adaptive nature of the gray wolf, the proposed changes to the habitat conditions should have little long-term or indirect effects on wolf habitation. This alternative would likely improve winter range for deer and elk potentially increasing the prey base within the project area. The impact to the gray wolf is considered insignificant.

3.9.2.2 Bull Trout

Alternative A: No Action

Potential impacts to bull trout would only exist in the event that this alternative had major adverse effects to the water quality of Dworshak Reservoir. No direct effects to water quality are expected given this alternative. Impacts to bull trout are considered insignificant.

Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Potential impacts to bull trout would only exist in the event that this alternative had major adverse effects to the water. Tractor yarding could negatively affect short-term water quality. However, Best Management Practices would reduce those adverse effects. BMPs such as prohibiting harvest from RHCAs; seeding all roads and landings; using berms, water bars, cross-draining, diversions, sediment traps, out sloping, and/or silt fences and closing work sites during heavy rains and snowmelt would all act to reduce impacts to water quality and to bull trout. Impacts to water quality were estimated to be insignificant given best management practices.

3.9.2.3 Fall Chinook Salmon

Alternative A: No Action

Potential impacts to fall Chinook salmon would only exist in the event that this alternative had major adverse effects to the water quality of the mainstem or the north fork of the Clearwater River. No direct effects to water quality are expected given this alternative. Impacts to fall Chinook salmon are considered insignificant.

Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Potential impacts to fall Chinook salmon would only exist in the event that this alternative had major adverse effects to the water quality of the mainstem or the north fork of the Clearwater River. Tractor yarding could negatively affect short-term water quality resulting in degraded environmental conditions for salmonid foraging and reproduction. However, Best Management Practices would reduce those adverse effects. BMPs such as prohibiting harvest from RHCAs; seeding all roads and landings; using berms, water bars, cross-draining, diversions, sediment traps, out sloping, and/or silt fences and closing work sites during heavy rains and snowmelt would all act to reduce impacts to water quality and to salmonids.

3.9.2.4 Steelhead

Alternative A: No Action

Potential impacts to steelhead would only exist in the event that this alternative had major adverse effects to the water quality of the mainstem or the north fork of the Clearwater River. No direct effects to water quality are expected given this alternative. Impacts to steelhead are considered insignificant.

Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Potential impacts to steelhead would only exist in the event that this alternative had major adverse effects to the water quality of the mainstem or the north fork of the Clearwater River. Tractor yarding could negatively affect short-term water quality resulting in degraded environmental conditions for salmonid foraging and reproduction. However, Best Management Practices would reduce those adverse effects. BMPs such as prohibiting harvest from RHCAs; seeding all roads and landings; using berms, water bars, cross-draining, diversions, sediment traps, out sloping, and/or silt fences and closing work sites during heavy rains and snowmelt will all act to reduce impacts to water quality and to steelhead.

3.10 Socioeconomic

3.10.1 Affected Environment

Clearwater County, Idaho, is experiencing high unemployment (15.3 percent for 2010 as compared to the State of Idaho, 9.6 percent) and a declining labor force. The failing lumber industry continues to impact the local economy. There is concern regarding the effects of the periodic Dworshak Reservoir drawdown on recreational activities for tourists (Idaho Commerce and Labor).

3.10.2 Environmental Consequences

3.10.2.1 Alternative A: No Action

Given no action, this alternative is expected to have no direct, indirect, and or cumulative effects on the local socioeconomic condition.

3.10.2.2 Alternative E: Harvest Using Multiple Yarding Methods and Prescribed Fire

Most benefits to the socioeconomic conditions would be seen through the creation of jobs associated with the work. This alternative is considered to moderately benefit the local socioeconomic condition.

Indirect effects could be actualized through the secondary effects of the jobs created for the manufacture and marketing of future lumber products and the future use of revenues generated with this alternative. This alternative is estimated to bring 5.3 million board feet to local mills. Further utilizing multiple yarding methods would greatly reduce the cost of yarding and increase project revenues. These revenues could be used in the future for similar natural resource management work potentially creating future jobs. As a result, indirect effects are determined to be greatly beneficial. Cumulatively this alternative has some benefits for local socioeconomic conditions.

3.11 Comparative Discussion

Direct effects from the preferred alternative were much higher than the No Action Alternative. However, indirect effects and cumulative effects were higher for the No Action Alternative. In the end, Alternative E was deemed the preferred alternative as the No Action Alternative would not meet Corps stewardship objectives.

3.12 Cumulative Impacts

NEPA and the CEQ regulations implementing the Act require federal agencies to consider the cumulative impacts of their actions. Cumulative effects are defined as, “the impact on the environment which results from the incremental impact of an action when added to other past, present and reasonable foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR § 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

The Dworshak area has a detailed history of environmental impacts tracing back to the construction era of the dam. The environmental impacts were considered in the *Final Environmental Impact Statement for Dworshak Dam and Reservoir, North Fork Clearwater River Idaho* (USACE 1975a).

3.12.1 Elk Mitigation

Management of the Corps’ forested lands surrounding the project has also involved providing mitigation for some of those impacts under guidelines established in the Fish and Wildlife Coordination Act (Public Law 85-624) and Department of the Army Engineer Regulations (ER 1105-2-129, ER 1120-2-400, and ER 1165-2-104).

The filling of the reservoir resulted in the loss of about 15,000 acres of terrestrial habitat. The greatest loss of wildlife habitat was the winter range of Rocky Mountain Elk (*Cervus elephus*), white-tailed deer (*Odocoileus virginianus*) and mule deer (*0.hemionus*). To offset this loss, mitigation lands have been developed and are managed specifically for winter range. Elk habitat mitigation maintenance requirements at Dworshak are

managed through Design Memorandum No. 15, *Plan for Development of Rocky Mountain Elk Habitat* (DM-15) (Corps, 1977). A total of 5,119 acres upstream of Grandad Bridge were acquired and have been managed for elk habitat mitigation since the 1970s.

While no additional timber sales are expected to occur in the Ahsahka Project area in the foreseeable future, the cumulative impacts resulting from implementing Alternative A, the No Action Alternative, would be continued poor forest health conditions, and suboptimal wildlife habitat conditions in the project area. This future condition would have no cumulative impact on the Wildlife Mitigation Area designated under DM-15. Cumulative impacts resulting from Alternative E, the Preferred Alternative, would be beneficial overall for elk mitigation at Dworshak, because of increased overall forest health in the area, although impacts would not be realized in the core elk management areas designated under DM-15.

3.12.2 Fisheries

The construction of Dworshak Dam also resulted in blocking anadromous steelhead trout and converting a river habitat to a reservoir. After Dworshak Reservoir was filled, kokanee salmon and smallmouth bass were stocked and became self-sustaining in the reservoir. The abundance of kokanee salmon in the reservoir has made it a favored sport species in the reservoir.

Mitigation for fish losses is implemented through the continued operation of the Dworshak Fish Hatchery, constructed and maintained by the Corps and operated by the USFWS. The hatchery is the largest steelhead hatchery in the world and has been producing steelhead since April 1969. The USFWS has operated the hatchery under a Memorandum of Understanding with the Corps to meet the "mitigation goal" of maintaining the North Fork of the Clearwater River "B" run steelhead as well as producing resident fish for stocking Dworshak Reservoir. Dworshak hatchery production is co-managed by the Nez Perce Tribe.

There would be no cumulative impacts to the hatchery, or to production of fish required for mitigation at the hatchery from either Alternative A or E. No other federal actions have been identified in the project area that could contribute to the cumulative impacts of the project on aquatic resources.

3.12.3 Public Use

The Corps has also developed a Public Use Plan (PUP) (USACE, 2011). The PUP defines management strategies for acceptable public use and access for lands and

waters of Dworshak Reservoir. The actions outlined in this plan replaced those presented in Design Memorandum No.10, *Public Use Plan for Development and Management of Dworshak Reservoir, North Fork Clearwater River, Idaho* (DM 10; USACE, 1970). The PUP updated the land classifications for Dworshak Reservoir, replacing land classifications that were out of date or out of compliance with current Corps regulations, and needing to address current site conditions. Updated land classifications provide for appropriate and proper use of the area's natural resources.

Cumulative impacts from Alternative A, the No Action Alternative, would be negligible, but negative relative to the PUP. Forest conditions under the no action conditions would likely inhibit the ability to meet the objectives of the PUP. However, under Alternative E, the Preferred Alternative, objectives of the PUP could more easily be met in the project area. Implementation of the PUP would incur only negligible cumulative impacts as described in the *Dworshak Dam and Reservoir Public Use Plan Land Classification Changes Programmatic Environmental Assessment* (USACE, 2011).

Visitation to Dworshak during fiscal year 2009 was 146,483. Visitation would likely continue at similar rates under both Alternative A and E, although Alternative E may provide a higher quality recreational experience, as overall forest health would be improved in the area. Alternative E may also improve access to the area with selective thinning, providing increased opportunities to experience areas difficult to reach under current, or no action, conditions.

3.12.4 Past and Future Actions

The Corps has also conducted several other stewardship projects, similar to the Ahsahka Stewardship Project, in the past. These projects include the Little Bay Stewardship Project (USACE, 2002), and the Elk Creek Meadows Stewardship Project (USACE, 2006), and all were implemented to restore ponderosa pine ecosystems. Other, smaller-scale, timber projects have also occurred at Dworshak, including the Bishop-Chutes Creek Timber Salvage Sale (USACE, 1997), and the Viewpoint Recreation Area Timber Sale (2008).

Future projects may include a Canyon Creek Recreation Enhancement Project and a Programmatic EA for Vegetative Management , which would be designed to support projects similar to the past restoration projects (Little Bay, Elk Creek Meadows, and Ahsahka), and additional forest health and recreation enhancement projects. One future restoration project is planned for the Swamp Creek area within the next five to ten years. This project is approximately 24 miles up-reservoir from the current project and again, would have limited cumulative effects. Several small sales may occur as well. These projects have contributed to improved forest health and wildlife habitat at Dworshak.

The Corps is currently preparing a supplemental programmatic EA to the *Dworshak Dam and Reservoir Public Use Plan Land Classification Changes Programmatic Environmental Assessment* (USACE, 2011). The supplement will analyze the potential environmental impacts associated with the programmatic management of forest/vegetation and wildlife resources within Corps-managed lands at Dworshak.

3.12.5 Other Federal and Non-Federal Actions

A large majority of forested land surrounding Dworshak Reservoir is owned and managed by the U.S. Forest Service (USFS). The USFS is currently engaged in several projects in the Clearwater National Forest; however, any negative environmental impacts associated with implementation of those projects are not expected to contribute cumulatively to the Ahsahka Stewardship Project. See Table 3-3 for a partial list of USFS current actions.

A portion of forested land within the Lower North-Fork Clearwater Basin is owned by Potlatch Corporation and the Idaho Department of Lands (IDL). Both of these entities manage forest lands primarily for timber production. Although it is possible that impacts resulting from actions being implemented by these entities could add to impacts created by the Ahsahka Stewardship Project, the Corps was unable to attain any information pertaining to present or future actions being carried out or planned by Potlatch and IDL. Therefore, it is difficult to analyze what those impacts may be. Although silvicultural prescriptions implemented on both Potlatch and IDL lands may result in improved forest heath or wildlife habitat for specific species, they typically do not achieve ponderosa pine restoration needs identified regionally.

Table 3-3: Clearwater National Forest, Schedule of Proposed Actions

Project Name	Project Purpose	Planning Status	Decision	Expected Implementation
Barnyard South Sheep EA	Watershed Management, Forest Products	Developing Proposal, Est Scoping Start: 12/2012	Expected: 09/2014	03/2015
Middle Bugs EA	Forest Products, Road Management	In Progress	Expected: 01/2013	06/2013

Source: U.S. Forest Service web site, http://data.ecosystem-management.org/nepaweb/current-sopa.php?forest=110105#6

SECTION 4.0 - COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

The following paragraphs address the principal environmental review and consultation requirements applicable to this project. Pertinent Federal statutes, executive orders (EO), and executive memorandums are included.

4.1 National Environmental Policy Act (NEPA)

This EA has been prepared and is being circulated to agencies and the public for review and comment pursuant to requirements of NEPA. No impacts significantly affecting the quality of the human environment have been identified at this time. If no such impacts are identified during the public review process, compliance with NEPA would be achieved upon the signing of a Finding of No Significant Impact (FONSI). However, if such impacts are identified during the public review, an Environmental Impact Statement (EIS) would be required. Compliance with NEPA would then be achieved upon completion of an EIS and the signing of a Record of Decision.

4.2 Endangered Species Act of 1973, As Amended

The Corps prepared a biological assessment in accordance with section 7(a)(2) of the ESA, which analyzed potential effects of the proposed action on listed species and designated critical habitat, and consulted with both the USFWS and NMFS. The USFWS concurred with the Corps' determination that the project “may affect, but is not likely to adversely affect” bull trout and designated bull trout habitat, that it will not affect Canada lynx or grizzly bear, and is not likely to jeopardize the continued existence of the gray wolf. NMFS concluded that the action, as described, is not likely to jeopardize the continued existence of Snake River Basin steelhead and Snake River fall Chinook salmon, or result in the destruction or adverse modification of designated critical habitat for these species. NMFS also provided an incidental take statement with their Biological Opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize incidental take associated with this action. These will be followed by the Corps.

4.3 National Historic Preservation Act, as Amended: Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971

The Corps of Engineers Environmental Compliance Section surveyed the project area and found no historic properties within the stewardship area. The Corps prepared and forwarded an archaeological report for the proposed project to the Nez Perce Tribal Historic Preservation Office (THPO) with a finding of "No historic properties affected." The THPO concurred with that finding in a letter dated February 10, 2011 (Appendix G).

4.4 Migratory Bird Treaty Act (MBTA) As Amended

Various provisions to protect active nesting raptors have been incorporated. In addition, monitoring of nesting activities would occur during the harvest operation to develop an understanding of migratory bird use. A no disturbance zone, with a radius of 150 feet, would be maintained around all raptor nests from March 1 to August 30. One bald eagle nest that exists in the area will have a larger no-disturbance zone based on recommendations from the USFWS. If tree removal is desired within this no disturbance zone, the removal would be conducted between October 1 and February 28. In addition, neither the nest tree(s), nor any other trees within 50 feet of the nest tree, would be removed. Snags would be left unless they present a hazard to logging or prescribed burning activities. A Corps wildlife biologist would survey the timber sale area prior to harvest activity to locate any active raptor nests within the units. The proposed action would not result in any take of species listed under the MBTA.

4.5 Bald and Golden Eagle Protection Act

One bald eagle nest that exists in the area will have a larger no-disturbance zone based on recommendations from the USFWS. If tree removal is desired within this no disturbance zone, the removal would be conducted between October 1 and February 28. In addition, neither the nest tree(s), nor any other trees within 50 feet of the nest tree, would be removed. Snags would be left unless they present a hazard to logging or prescribed burning activities. A Corps wildlife biologist would survey the timber sale area prior to harvest activity to locate any active raptor nests within the units. Because of the implementation of recommendations from the USFWS, disturbance of nesting bald eagles is unlikely to occur. No take of either bald or golden eagles would occur due to the proposed project.

4.6 Clean Air Act, As Amended

Compliance with the standards of the Northern Idaho Airshed Group is discussed in section 3.3. The proposed actions are in compliance with the CAA. Pursuant to Section 176(C) and 309 of the Act, this environmental assessment would be provided to the EPA.

4.7 Federal Water Pollution Control Act (Clean Water Act)

If it is determined that this project would result in the discharge of dredged or fill material below the ordinary high water mark, and a Nationwide Permit (NWP) does not apply, a 404(b)(1) Evaluation would be prepared by the Corps and submitted to the Idaho Department of Environmental Quality along with a request for state 401 Certification. General discussion of potential impacts of the proposed action upon water quality is addressed in section 3.2.

4.8 Fish and Wildlife Coordination Act

The proposed action does not fall under the requirements of the Act.

4.9 Wild and Scenic Rivers Act

No rivers designated as “wild and scenic” occur within or near the proposed project area.

4.10 Northwest Electric Power Planning and Conservation Act (Northwest Power Act)

The proposed action does not conflict with the requirements of the Act or the Columbia Basin Fish and Wildlife Program.

4.11 Executive Order 11988, Flood Plain Management, May 24, 1977

The proposed project would not occur in a floodplain.

4.12 Executive Order 11990, Protection of Wetlands, May 24, 1977

Wetlands would not be impacted by the proposed action.

4.13 Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, November 6, 2000

Government to Government consultation was offered to the Nez Perce Tribe. The FONSI will document Government to Government consultation results.

SECTION 5.0 - LITERATURE CITED

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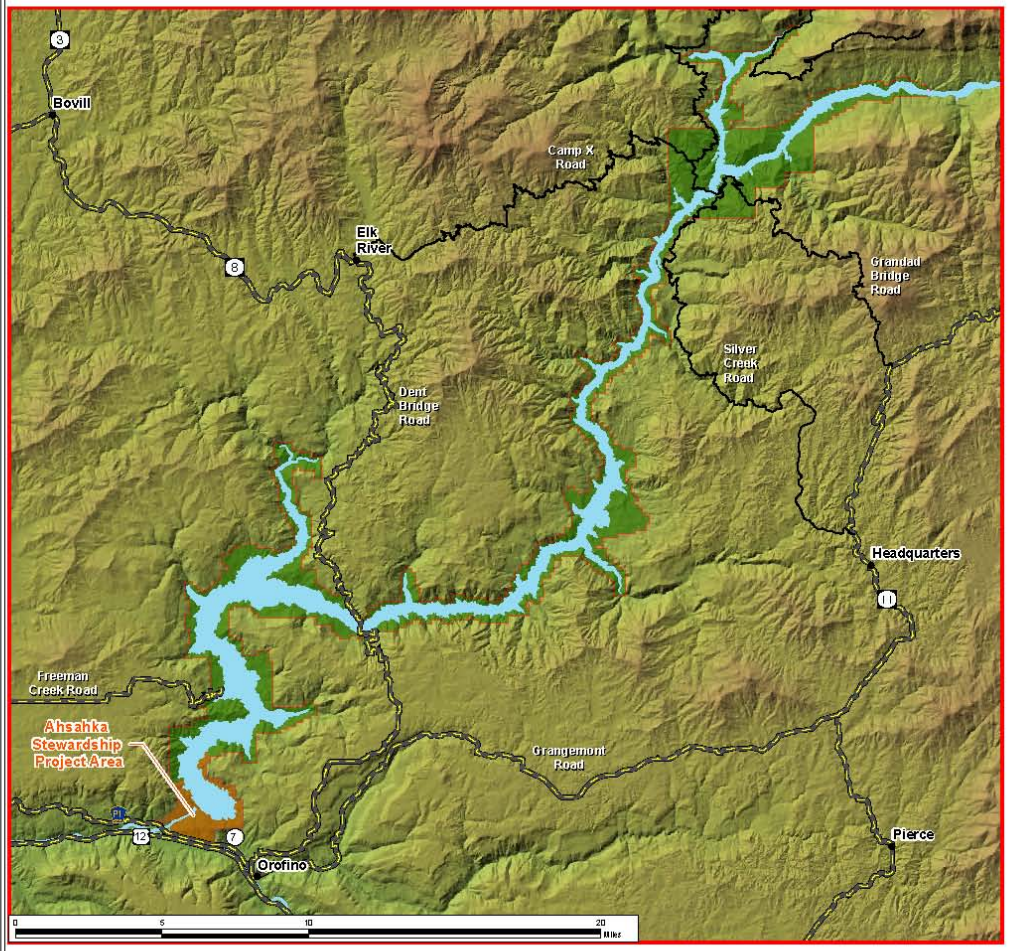
APPENDIX A

SITE MAPS



Large Map Legend

- Streams
- Dworshak Reservoir
- Ahsahka Stewardship Project
- Dworshak Project Managed Lands

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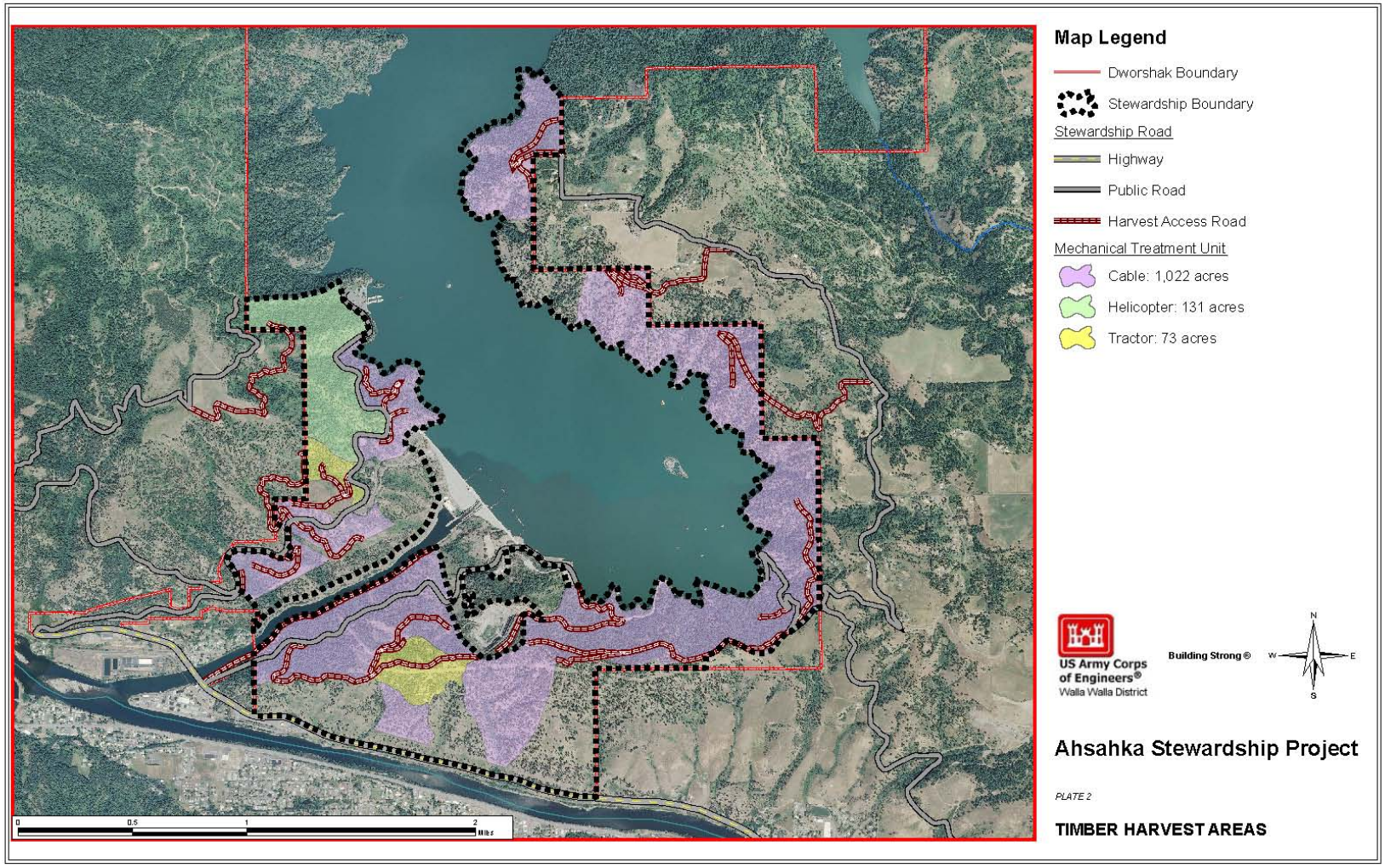
Ahsahka Stewardship Project

PLATE 1

VICINITY MAP


Map Legend
Dworshak Boundary
Stewardship Boundary
Stewardship Road
Highway
Public Road
Harvest Access Road
Mechanical Treatment Unit
Cable: 1,022 acres
Helicopter: 131 acres
Tractor: 73 acres
US Army Corps of Engineers®
Walla Walla District
Building Strong ®
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Ahsahka Stewardship Project
PLATE 2
TIMBER HARVEST AREAS
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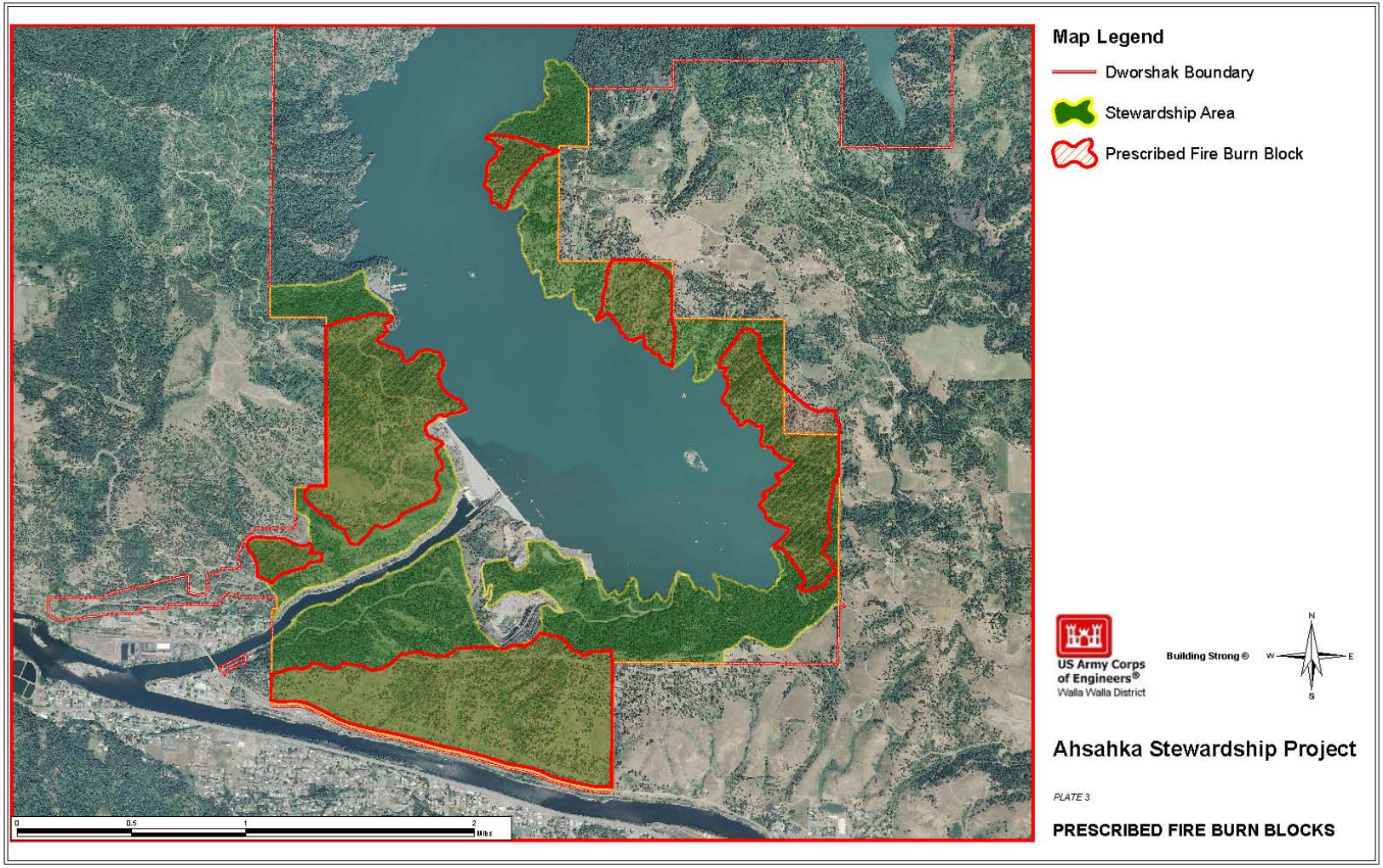
2
Miles


Map Legend
Dworshak Boundary
Stewardship Area
Prescribed Fire Burn Block
US Army Corps of Engineers®
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Ahsahka Stewardship Project
PLATE 3
PRESCRIBED FIRE BURN BLOCKS
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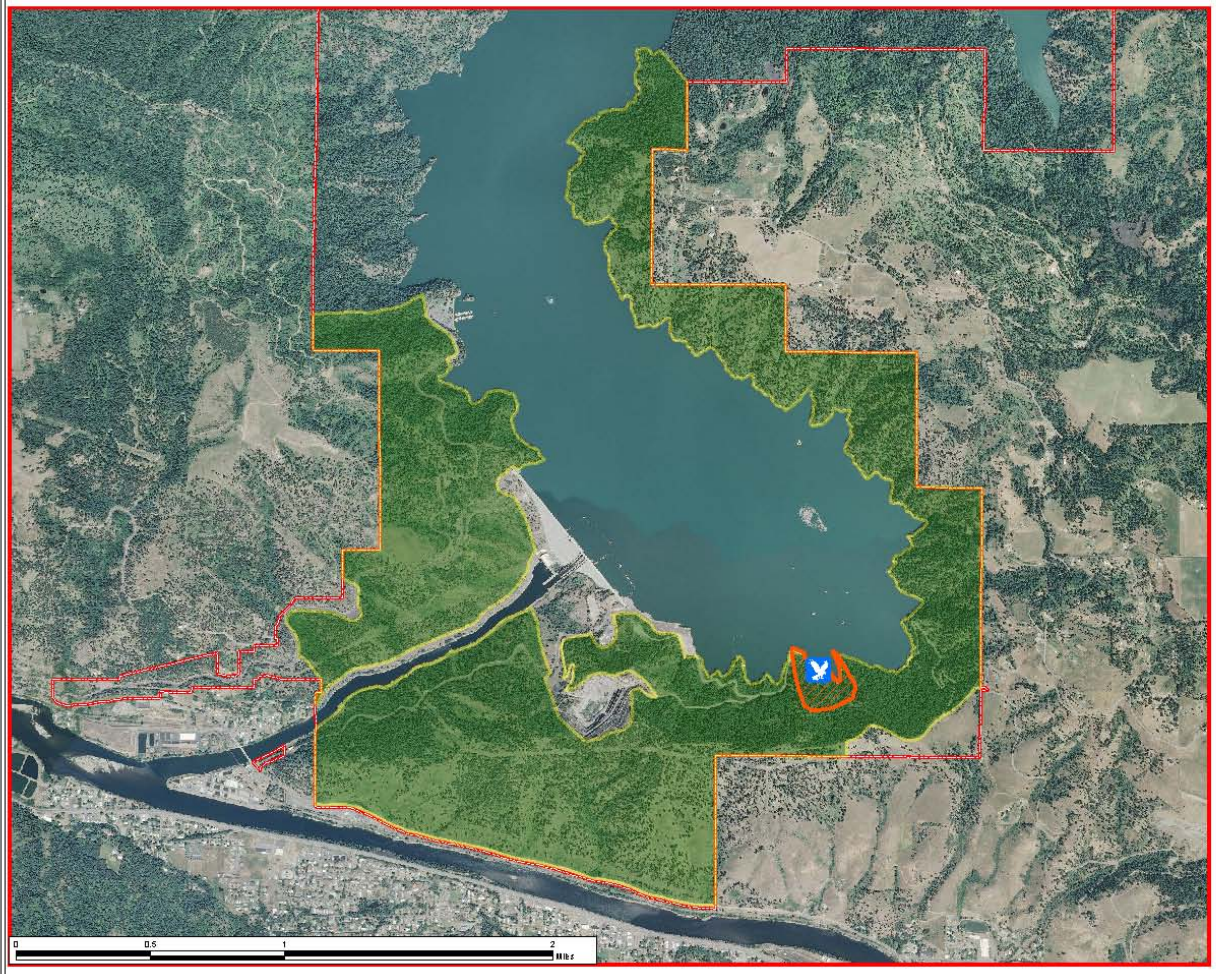
Miles



Map Legend

- Bald Eagle Nest
- Dworshak Boundary
- Stewardship Area
- No Disturbance Buffer

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Ahsahka Stewardship Project

PLATE 4

BALD EAGLE NEST
NO DISTURBANCE BUFFER

APPENDIX B

FIRE ECOLOGY AND PONDEROSA PINE ECOSYSTEMS

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APPENDIX B FIRE ECOLOGY AND PONDEROSA PINE ECOSYSTEMS

B.1 Introduction

Fire is a primary event that influences and determines ecosystem processes such as the movement of nutrients from soil to plants to wildlife. Expected conditions are primarily a result of the historic fire regime. Fire regimes describe the pattern of natural fire events, primarily fire frequency and intensity. Stand-replacing or high-intensity fire events are more likely today then during pre-settlement times. Research (Arno 1980, Cooper 1991, and Green 1996) indicates that fire was far more common than it is today, but far less intense in magnitude. It is important to understand how existing conditions came about and compare that with the historic condition. The regional loss of ponderosa pine ecosystems illustrates the effect of fire prevention, but its effect is not limited to one species. The following list outlines the process by which Corps staff evaluated the need for treatment within the Ahsahka area:

- Determined the habitat types present.
- Determined the ecological fire regimes of those habitat types.
- Depicted expected condition based on fire regime.
- Compared the expected condition to the current condition to establish need.

B.2 Fire Ecology

Within Dworshak Dam and Reservoir (Dworshak) and the surrounding area, wildfire and its effects have been suppressed for over 100 years. All four habitat types occurring within the stewardship project (highlighted in gray) were historically affected by wildfire (Table B-1). The past and present management action of fire suppression has drastically altered the vegetative composition, form, and structure of most forest stands within the stewardship project, which has lead to current undesirable conditions. Similar effects to forest conditions have been observed regionally and are likely the cause for the decline of several native wildlife species.

The Idaho Bird Conservation Plan (IBCP) (Ritter et al. 2000) created by Partners in Flight (PIF) identifies the need for the conservation, protection, and restoration of ponderosa pine (Pinus ponderosa) ecosystems (Ritter et al. 2000). The Ecosystem Management Research Institute (EMRI) under contract with PIF is currently working to identify the extent and location of historic and existing ponderosa pine ecosystems within Idaho. The EMRI estimates that 95 percent of historic ponderosa pine ecosystems in Idaho have been lost to logging, agriculture, and fire suppression (personal comment Jon Haufler, CEO EMRI). Regional impacts to several native

wildlife populations have been attributed to these changes in forest condition, namely, pigmy nuthatch, Lewis' woodpecker, and flammulated owl. Within the IBCP, the PIF advocates the restoration of ponderosa pine ecosystems through thinning and burning within dry ponderosa pine/Douglas fir (Pseudotsuga menziesii)/grand fir (Abies grandis) habitat types. The EMRI has identified these habitat types as historically being dominated by ponderosa pine, given a historic fire regime of frequent (every 7-25 years) underburns. Various studies help to define the appropriate species composition, structure, and form of forest of these habitat types given fire regime.

Table B-1. Fire Characteristics of Dworshak Habitat Types

Habitat Types	Acres	Fire Group[1]	Biophysical Setting	Average Fire Interval[2]			
				All Fires	Surface	Mixed	Replacement
Ponderosa Pine/Idaho Fescue	1462	1	80531	6	8	35	125
Ponderosa Pine/Snowberry	208	1	80531				
Douglas Fir/Snowberry	13	1	1010451	21			
Douglas Fir/Mallow Ninebark	3245	2	1010451				
Grand Fir/Mallow Ninebark	6296	2	1010451				
Grand Fir/Twinflower	81	7	1010451				
Grand Fir/Bride's Bonnet	590	7	1010453	69		100	220
Grand Fir/Wild Ginger	604	7	1010453				
Western Red Cedar/Bride's Bonnet	10384	8	1010471	80		133	200
Western Red Cedar/Wild Ginger	2374	8	1010471				
Western Red Cedar/Oak Fern	49	8	1010471				
Western Hemlock/Bride's Bonnet	1009	8	1010471				
Western Hemlock/Wild Ginger	62	8	1010471				
Western Red Cedar/Maidenhair Fern	935	9	1010471				

[1] Derived from Smith and Fischer 1997.
[2] Derived from LANDFIRE: Vegetation Dynamic Moods (*www.landfire.gov/national_veg_models_op1.php*, 8/12/2010).

Many areas below Dent Bridge on Dworshak Reservoir consist of habitat types as described by the IBCP. Of these areas, Ahsahka was selected for treatment based on the proportion of these dry habitat types and the ease of access. All of the habitat types occurring within the Ahsahka Stewardship Project boundary have been identified as dry forest types dominated by ponderosa pine and Douglas fir. Detailed vegetative inventories (conducted by BLM staff) have shown these forests stands as being outside of the expected conditions (primarily tree density) given habitat type and fire regime and are not providing habitat for specific wildlife species in need.

B.3 Ponderosa Pine Ecosystems

Today, ponderosa pine ecosystems are considered endangered, with current estimates of loss between 85 and 98 percent of its historical amounts in Idaho. It is difficult to find stands that resemble the historical ecosystem conditions. Current conditions in the low elevation forests of Idaho are dominated by high densities of small to medium-sized grand fir, Douglas fir, or ponderosa pine, depending upon the site. These stands

usually have dense understories of shrubs and small trees. Residual, large ponderosa pines remain in some locations, but many of these old pines are dying off due to competition for water and nutrients from the high density of smaller trees. The remaining stands with residual large pine are more susceptible to stand-replacing fire due to the high density of smaller trees and the dense underbrush. These types of fires rarely if ever occurred within these types of forests historically. As these forest conditions go untreated, competition and stand-replacing fire would continue to eliminate large ponderosa pines and our ability to restore ponderosa pine ecosystems. Thus, the risk of continued habitat loss and population declines is very high for species dependent upon historical ponderosa pine forests.

Historically, ponderosa pine ecosystems occurred throughout the Northern Rockies in low elevation forests that were maintained by a disturbance regime of understory fires with a 5- to 35-year return interval. This disturbance regime produced low densities of large ponderosa pines with open, grassy understories. This was a dominant forest type at low elevations prior to Euro-American settlement. Starting in the late 1800s, several activities occurred that changed these ecosystems. First, intensive grazing by cattle and sheep reduced the understory vegetation that carried fires across the landscape. Second, logging began the removal of a majority of the large ponderosa pines. Third, fire exclusion policies initiated in the early 1900s further reduced the occurrence of the high-frequency underburns. Ponderosa pine trees have evolved to be fire resistant. Their thick bark and few low hanging branches helps protect them from understory fires These moderate-intensity fires killed less resistant species, such as Douglas fir and grand fir, as well as most of the regenerating ponderosa pine but allowed enough ponderosa pine to survive to maintain the density of large trees. The historical fires produced stands with densities of only 10-50 trees/acre dominated by large to very large trees.

B.3.1 Habitat Loss

Habitat loss, whether caused by direct alteration or by indirect changes in disturbance regimes such as fire, is one the greatest threats to biological diversity. Numerous ecosystems that provide essential habitat for many species have experienced dramatic declines in the United States, with a corresponding loss of habitat for associated species. The ponderosa pine ecosystem of the Northern Rocky Mountains is one such ecosystem, with resulting impacts on a number of species including the northern Idaho ground squirrel, white-headed woodpecker, flammulated owl, and pygmy nuthatch.

The loss of ponderosa pine ecosystems has had a corresponding functional loss of habitat for many associated species. O'Neil et al. (2001) compiled wildlife-habitat relationship tables for Washington and Oregon that include the late successional stage for the ponderosa pine forest type. Extrapolating these relationships to Idaho's

ponderosa pine forests indicates that 19 species occurring on Idaho Department of Fish and Game's, Priority Species List are either "closely associated" or "generally associated" with the old-growth ponderosa pine ecosystem. Six species were identified as closely associated and include the white-headed woodpecker, flammulated owl, pygmy nuthatch, northern goshawk, great gray owl, and long-legged myotis. Thirteen species were identified as generally associated and include the Columbia spotted frog, Northern alligator lizard, ringneck snake, bald eagle, peregrine falcon, mountain quail, fringed myotis, northern pygmy owl, three-toed woodpecker, black-backed woodpecker, coast mole, yuma myotis, and long-eared myotis. In addition, Idaho PIF (Ritter 2000) identified old-growth ponderosa pine as a priority habitat for restoration in Idaho and confirmed the association of three focal bird species within these ecosystems: the flammulated owl, white-headed woodpecker, and pygmy nuthatch. They also identified the Lewis' woodpecker as an associated species. Loss of ponderosa pine habitat and associated openings has caused the northern Idaho ground squirrel to be listed as a threatened species under the Endangered Species Act. It has also caused species associated with these ecosystems, such as yellow pine chipmunks and white-breasted nuthatches, to be reduced in range and numbers.

B.3.2 Restoration

Most experts agree that restoration of the ponderosa pine forest must begin immediately in order to save the remaining large, old ponderosa pine from stand-replacing fire and mortality due to competition. Some have estimated that within Idaho, there is less than 20 years to restore the remaining old-growth ponderosa pine to conditions that more closely resemble historical conditions before stand-replacing wildfires and tree mortalities would take their toll. Without intervention, those few stands that escape wildfire or mortality and are available for restoration would be too small and isolated to contribute to landscape-level biodiversity or ecosystem objectives.

Restoration and conservation strategies must target saving any existing old growth or large ponderosa pines where they occur and improving survival and growth rates of ponderosa pine where they can reestablish.

The underlying purpose of this project is to restore the vegetative composition form and structure to a desired condition consistent with historic, natural ecosystem processes.

B.4 Habitat Types

There are 4 habitat types that occur within the proposed project area. The historic fire regime, which characterizes the function of fire as an ecosystem process, varied little between each of these habitat types. The fire interval was probably 5-20 years with cool underburns for the ponderosa pine series and 7-25 years for the Douglas fir series (Arno 1980). In northern Idaho, habitat types within the grand fir series have registered

repeated underburns that have maintained open, seral species forests prior to 1900 (Arno 1980). The elimination of the historical pattern of frequent low-intensity fires in both ponderosa pine and pine-mixed conifer forests has resulted in major ecological disruptions (Arno 1996). Without frequent fire, timber stands become overstocked and stressed as individual trees compete for limited moisture and nutrients. As a result, stands are more susceptible to beetle infestation, disease, and stand-replacing wildfires [Interior Columbia Basin Ecosystem Management Project (ICBEMP) 1997, Greene and Evenden 1996]. Overstocking of trees, signs of beetle infestation, and disease are all present within the proposed restoration area. Fire suppression also changes the species composition of certain forest stands. On drier Douglas fir habitat types, many stands experienced frequent, moderately hot burns and thus perpetuated the occurrence of ponderosa pine on the site as the climax species (ICBEMP 1997, Cooper et al. 1991). Fire acted to reduce encroachment of species less fire tolerant and more shade tolerant. Table B-1 lists the habitat types found on Dworshak Reservoir and their associated fire regimes.

B.5 Ecosystem Management Objectives

Smith and Fischer (1997) grouped habitat types based on similar fire regimes, suggesting that they should be managed similarly. They developed eight fire groups comprised of the habitat types found in north-central Idaho. Smith and Fisher characterized expected forest conditions within each of the fire groups as a result of the fire regimes. Generally, the primary goals within dry ponderosa pine, dry Douglas fir, and dry grand fir habitat types (fire groups one and two) are to reduce tree densities, retain large diameter trees of preferred tree species, encourage the regeneration of early successional tree species, and reduce the risk of stand-replacing fires. Fire group eight includes the wetter habitat types within the project area. The ecosystem management objectives are listed for each fire group as follows:

B.5.1 Fire Group One Sites

- Reduce tree density to 30-50 trees per acre, favoring ponderosa pine, western larch, and Douglas fir.
- Reduce basal area to 40-80.
- Leave 20-30 large diameter [>20 inches diameter at breast height (DBH)] trees per acre.
- Prepare a seedbed for the regeneration of ponderosa pine.

B.5.2 Fire Group Two Sites

- Reduce tree density to 30-80 trees per acre, favoring ponderosa pine, western larch, and Douglas fir.
- Reduce basal area to 40–100.
- Leave 20-35 large diameter (>20 inches DBH) trees per acre.
- Prepare a seedbed for the regeneration of ponderosa pine.
- Reduce the risk for stand-replacing fire.

B.6 Forest and Woodland Management Objectives

The primary goals to improve conditions for timber, wildlife, and recreation are to improve forest health, increase big game forage, and minimize the visual intrusiveness of the logging operation on reservoir users. Specific forest and woodland management objectives for each fire group are listed as follows:

B.6.1 Fire Group One and Two Sites

- Select trees for removal (those with faded needles and those with evidence of insect or disease attacks).
- Retain trees with particular value to wildlife.
- Reduce the average height and increase the production of preferred browse species present.
- Choose harvest and extraction methods in critical locations that minimize visual intrusion.

B.7 Summary of Conditions and Treatments Needed

B.7.1 Fire Group One Sites

Of the fifteen forest stands within the Ahsahka Stewardship Project six are Fire Group One stands. Data from plots taken in five of the six stands are summarized in table B-2. Based on historic fire regimes of fire group 1, tree densities are much greater than expected conditions.

Table B-2. Current Stand Data

Fire Group	Habitat Types Present	Stands Sampled	Acres Represented in Sample	Number of Plots	Current Stand Data	
					Trees per Acre	Basal Area per Actre
i	Ponderosa Pine Bluebunch wheatgrass	11, 12, 15, 16	454	8	146	73
	Ponderosa Pine Snowberry	1	291	6		
ii	Douglas Fir Ninebark	2,4,14	237	4	165	123
	Grand Fir Ninebark	10	265	2		

The average surface fire interval for fire group 1 stands is 8 years (table B-1). These conditions would promote open forests dominated with fire tolerant species, particularly ponderosa pine (Smith and Fischer 1997). Efforts to reconstruct historic structure and species composition on south-facing stands, within fire group one habitat types on the Lolo National Forest, found that prior to 1900 total trees/per acre were 38 (Habeck 1990). The current trees per acre are estimated at 146 (table B-2). C. Fiedler (1998) describes appropriate ecological target densities following treatment of overstocked second-growth ponderosa pine/fir forests as a range of 40 to 80 square feet of basal area. The current average basal area is 73 square feet (table B-2). He further states that the target should be in the lower range if a primary project goal is the regeneration of ponderosa pine. The current dominant over-story species, ponderosa pine, is consistent with historic description of the over-story composition. However, given historic comparisons for tress per acre and basal area the current fire group I stands are overstocked with smaller diameter trees. Frequent underburns within fire group one forests acted to eliminate most regeneration and thin young stands (Smith and Fischer 1997). The current overstocked conditions are a result of a lack of frequent surface fires needed for the natural thinning process.

The most dominant browse species found within the inventory plot included chokecherry (*Prunus virginiana*) and serviceberry (*Amelanchier alnifolia*), Huckleberry (*Vaccinium globulare*) and redstem ceanothus (*Ceanothus sanguineus*) were also present. At most plots the average height of both serviceberry and chokecherry were over six foot tall. Other shrub species include; mallow ninebark (*Physocarpus malvaceus*), snowberry (*Symphoricarpos albus*) and oceanspray (*Holodiscus discolor*). Most common grasses were bluebunch wheatgrass (*Agropyron spicatum*) and Pine reedgrass (*Calamagrostis rubescens).* Brackenfern (*Pteridium aquilinum*) was also well represented on several plots.

B.7.2 Fire Group Two Sites

Nine of the fifteen stands were fire group two habitat types. Four of these stands were inventoried and the data are summarized in table B-2. The following paragraphs compare and discuss the current conditions to the expected conditions given the fire regime for these habitat types. The current stand conditions are found to be well outside of expected conditions.

The average fire interval for fire group two habitat types consists of frequent surface fires every 35 years and mixed severity burns every 60 years with an overall average fire interval of every 21 years (table B-1). All potential successional pathways for fire group two stands, described in Smith and Fischer 1997, result in “open forest structure,” with the exception of lodgepole pine dominated stands, not present within the project area. The IBCP identifies all dry ponderosa pine/Douglas fir/grand fir habitat types as historically being characterized by old-growth ponderosa pine forests. Prior to 1900, forest stands on north-facing slopes of Douglas fir/ninebark habitat types in western Montana supported 27 large trees per acre with ponderosa pine and western larch co-dominant. The total density of trees per acre was 43 (Habeck 1990). Studies in central Idaho indicated that 36 and 84 (Sloan 1996) were average historical conditions on Douglas fir and grand fir habitat types, respectively. Approximately 33 percent of these trees were less than 20 inches DBH. Largely Douglas fir dominates current stands whereas historically ponderosa pine was the dominant tree species. Further, the current trees per acre are estimated at 165 (table B-2) which is much higher than expected under historical conditions. Both the species composition and the form and structure of these stands are out of balance.

The dominant browse specie observed within the fire group two stands was serviceberry. Huckleberry was also present along with other non-preferred shrubs; oceanspray, mallow ninebark and snowberry. Serviceberry averaged over 6 feet in height, predominantly unavailable as big game browse. .

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APPENDIX C

MONITORING PLAN

C.1 Background

The Interior Columbia Basin Ecosystem Management Project (ICBEMP) determined that the North Fork of the Clearwater River subbasin is below the historical range of variability for the lower montane late seral forest and lower montane early seral forest, as a result of logging practices and fire suppression.

The elimination of the historical pattern of frequent low-intensity fires in both ponderosa pine and pine-mixed conifer forests has resulted in major ecological disruptions (Arno 1996). Without frequent fire, timber stands become overstocked and stressed as individual trees compete for limited moisture and nutrients. As a result, stands are more susceptible to beetle infestation, disease, and stand-replacing wildfires. The ICBEMP has also documented a scarcity in associated wildlife as a result of the present condition.

This plan would be used for all action alternatives.

C.2 Location

The proposed Ahsahka Stewardship Project is located near Dworshak Dam between river miles 0 and 4 on selected Corps-administered forestlands encompassing a portion of Dworshak, Township 37N, Range 1E, Sections 23, 25, 26, 27, 34, 35, 36, and Township 36N, Range 1E Sections 2 and 3, Clearwater County, Idaho.

C.3 Project Objectives

- Reduce the risk of stand-replacing wildfire.
- Increase the proportion, average size, and the vigor of early seral tree species (ponderosa pine, Douglas fir, and western larch).
- Increase the recruitment of ponderosa pine and western larch.
- Reduce the average age and increase vigor of the understory.
- Reduce liability for the Corps by reducing wildfire potential on Corps managed lands.

C.4 Monitoring Plan Objectives

- Establish pre-treatment inventory plots.
- Establish post-treatment monitoring sites to measure change in species structure.

- Take photos.
- Update report at first, third, and fifth year intervals.

C.5 Implementation

Twenty-one one-tenth acre inventory plots have been established, representing all the different habitat types present throughout the stewardship project area. From these, permanent monitoring plots will be identified to be monitored following the stewardship activities. The minimum would be one plot for every 100 acres with at least one per habitat type. Monitoring shall consist of photos and the collection of the following data:

- Canopy cover.
- Number and percentage of cover of browse species.
- Fuel level.
- Overstory species and size class.
- Report findings.

APPENDIX D

LIST of WILDLIFE at DWOSRHAK DAM and RESERVOIR

Wildlife Species Found at Dworshak

Last Updated 10/16/2009

Amphibians:	8
Reptiles:	6
Birds:	151
Mammals:	39

Amphibians

Common Name	Scientific Name
Long-toed salamander	*Ambystoma macrodactylum*
Coeur d'Alene salamander	*Plethodon idahoensis*
Idaho giant salamander	*Dicamptodon aterrimus*
Tailed frog	*Ascaphus truei*
Western toad	*Bufo borealis*
Pacific chorus frog	*Pseudacris regilla*
Columbia spotted frog	*Rana luteiventris*
Bullfrog	*Rana catesbeiana*

Reptiles

Common Name	Scientific Name
Northern alligator lizard	*Elgaria coerulea*
Western skink	*Eumeces skiltonianus*
Rubber boa	*Charina bottae*
Gopher snake	*Pituophis catenifer*
Ring-necked snake	*Diadophis punctatus*
Western terrestrial garter snake	*Thamnophis elegans*
Common garter snake	*Thamnophis sirtalis*
Western rattlesnake	*Crotalus viridis*

Birds

Common Name	Scientific Name
Common loon	*Gavia immer*
Horned grebe	*Podiceps auritus*
Red-necked grebe	*Podiceps grisegena*
Western grebe	*Aechomophorus occidentalis*
Clark's grebe	*Aechmophorus clarkii*
American white pelican	*Pelecanus erythrorhyncos*
Double-crested cormorant	*Phalacrocorax auritus*
Great blue heron	*Ardea herodias*
Trumpeter swan	*Cygnus buccinator*
Canada goose	*Branta canadensis*
Snow goose	*Chen caerulescens*
Wood duck	*Aix sponsa*
Green-winged teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
Northern pintail	*Anas acuta*
Blue-winged teal	*Anas discors*
Cinnamon teal	*Anas cyanoptera*
Northern shoveler	*Anas clypeata*
Gadwall	*Anas strepera*
American wigeon	*Anas americana*
Redhead	*Aythya americana*
Ring-necked duck	*Aythya collaris*
Harlequin duck	*Histrionicus histrionicus*
Common golden-eye	*Bucephala clangula*
Bufflehead	*Bucephala albeola*
Hooded merganser	*Lophodytes cucullatus*
Common merganser	*Mergus merganser*
Ruddy duck	*Oxyura jamaicensis*
Turkey vulture	*Cathartes aura*
Osprey	*Pandion haliaetus*
Bald eagle	*Haliaeetus leucocephalus*
Sharp-shinned hawk	*Accipiter striatus*
Cooper's hawk	*Accipiter cooperii*
Northern goshawk	*Accipiter gentilis*
Swainson's hawk	*Buteo swainsoni*
Red-tailed hawk	*Buteo jamaicensis*
Golden eagle	*Aquila chrysaetos*
Merlin	*Falco columbarius*
American kestrel	*Falco sparverius*
Spruce grouse	*Dendragapus canadensis*
Blue grouse	*Dendragapus obscurus*
Ruffed grouse	*Bonasa umbellus*
Wild turkey	*Meleagris gallopavo*
California quail	*Callipepla californica*
Mountain quail	*Oreortyx pictus*
American coot	*Fulica americana*
Semi-palmated plover	*Charadrius semipalmatus*
Killdeer	*Charadrius vociferus*
American avocet	*Recurvirostra americana*
Spotted sandpiper	*Actitus macularia*
Western sandpiper	*Calidris mauri*
Least sandpiper	*Calidris minutilla*
Baird's sandpiper	*Calidris bairdii*

Birds (continued)

Common Name	Scientific Name
Semi-palmated sandpiper	*Calidris pusilla*
Solitary sandpiper	*Tringa solitaria*
Wilson's phalarope	*Phalaropus tricolor*
Long-billed dowitcher	*Limnodromus scolopaceus*
Franklin's gull	*Larus pipixcan*
Ring-billed gull	*Larus delawarensis*
California gull	*Larus californicus*
Caspian tern	*Sterna caspia*
Mourning dove	*Zenaida macroura*
Flammulated owl	*Otus flameolus*
Great-horned owl	*Bubo virginianus*
Northern pygmy owl	*Glaucidium gnoma*
Barred owl	*Strix varia*
Northern saw-whet owl	*Aegolius acadicus*
Common nighthawk	*Chordeiles minor*
Vaux's swift	*Chaetura vauxi*
White-throated swift	*Aeronautes saxatalis*
Calliope hummingbird	*Stellula calliope*
Rufous hummingbird	*Selasphorus rufus*
Belted kingfisher	*Ceryle alcyon*
Lewis's woodpecker	*Melanerpes lewis*
Williamson's sapsucker	*Sphyrapicus thyroideus*
Red-naped sapsucker	*Sphyrapicus nuchalis*
Downy woodpecker	*Picoides pubescens*
Hairy woodpecker	*Picoides villosus*
Northern flicker	*Colaptes auratus*
Pileated woodpecker	*Dryocopus pileatus*
Olive-sided flycatcher	*Contopus borealis*
Western wood-pewee	*Contopus sordidulus*
Willow flycatcher	*Empidonax traillii*
Hammond's flycatcher	*Empidonax hammondii*
Dusky flycatcher	*Empidonax oberholseri*
Least flycatcher	*Empidonax minimus*
Cordilleran flycatcher	*Empidonax occidentalis*
Eastern kingbird	*Tyrannus tyrannus*
Tree swallow	*Tachycineta bicolor*
Violet-green swallow	*Tachycineta thalassina*
Cliff swallow	*Hirundo pyrrhonta*
Barn swallow	*Hirundo rustica*
Gray jay	*Perisoreus canadensis*
Steller's jay	*Cyanocitta stelleri*
Clark's Nutcracker	*Nucifraga columbiana*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Black-capped chickadee	*Poecile atricapillus*
Mountain chickadee	*Poecile gambeli*
Chestnut-backed chickadee	*Poecile rufescens*
Red-breasted nuthatch	*Sitta canadensis*
White-breasted nuthatch	*Sitta carolinensis*
Pygmy nuthatch	*Sitta pygmaea*
Brown creeper	*Certhia americana*
Rock wren	*Salpinctes obsoletus*
Canyon wren	*Catherpes mexicanus*
House wren	*Troglodytes aedon*
Winter wren	*Troglodytes troglodytes*
Marsh wren	*Cistothorus palustris*
American dipper	*Cinclus mexicanus*
Golden-crowned kinglet	*Regulus satrapa*
Ruby-crowned kinglet	*Regulus calendula*
Western bluebird	*Sialia mexicana*
Mountain bluebird	*Sialia currucoides*
Townsend's solitaire	*Myadestes townsendi*
Veery	*Catharus fuscescens*
Swainson's thrush	*Catharus ustulatus*
American robin	*Turdus migratorius*
Varied thrush	*Ixoreus naevius*
Gray catbird	*Dumetella carolinensis*
European starling	*Sturnus vulgaris*
Cedar waxwing	*Bombycilla cedrorum*
Cassin's vireo	*Vireo cassinii*
Warbling vireo	*Vireo gilvus*
Red-eyed vireo	*Vireo olivaceus*
Orange-crowned warbler	*Vermivora celata*
Nashville warbler	*Vermivora ruficapilla*
Yellow warbler	*Dendroica petechia*

Birds (continued)

Common Name	Scientific Name
Yellow-rumped warbler	*Dendroica coronata*
Townsend's warbler	*Dendroica townsendi*
American redstart	*Setophaga ruticilla*
Northern waterthrush	*Seiurus noveboracensis*
MacGillivray's warbler	*Oporornis tolmiei*
Common yellowthroat	*Geothlypis trichas*
Yellow-breasted chat	*Icteria virens*
Western tanager	*Piranga ludoviciana*
Black-headed grosbeak	*Pheucticus melanocephalus*
Lazuli bunting	*Passerina amoena*
Spotted towhee	*Pipilo erythrophthalmus*
Chipping sparrow	*Spizella passerina*
Vesper sparrow	*Pooecetes gramineus*
Savannah sparrow	*Passerculus sandwichensis*
Fox sparrow	*Passerella iliaca*
Song sparrow	*Melospiza melodia*
Lincoln's sparrow	*Melospiza lincolnii*
White-crowned sparrow	*Zonotrichia leucophrys*
Dark-eyed junco	*Junco hyemalis*
Red-winged blackbird	*Agelaius phoeniceus*
Brown-headed cowbird	*Molothrus ater*
Bullock's oriole	*Icterus bullockii*
Cassin's finch	*Carpodacus cassinii*
Red crossbill	*Loxia curvirostra*
Pine siskin	*Carduelis pinus*
American goldfinch	*Carduelis tristis*
Evening grosbeak	*Coccothraustes vespertinus*

Mammals

Common Name	Scientific Name
Vagrant shrew	*Sorex vagrans*
Dusky shrew	*Sorex monticolus*
Little brown bat	*Myotis lucifugus*
Yuma myotis	*Myotis yumanensis*
Long-eared myotis	*Myotis evotis*
California myotis	*Myotis californicus*
Silver-haired bat	*Lasionycteris noctivagans*
Big brown bat	*Eptesicus fuscus*
Townsend's big eared bat	*Plecotus townsendii*
Mountain cottontail	*Sylvilagus nuttallii*
Snowshoe hare	*Lepus americanus*
Yellow pine chipmunk	*Tamias amoenus*
Red-tailed chipmunk	*Tamias ruficaudus*
Yellow-bellied marmot	*Marmota flaviventris*
Columbian ground squirre	*Citellus columbianus*
Red squirrel	*Tamiasciurus hudsonicus*
Northern flying squirrel	*Glaucomys sabrinus*
Northern pocket gopher	*Thomomys talpoides*
Deermouse	*Peromyscus maniculatus*
Bushy-tailed woodrat	*Neotoma cinerea*
Boreal red-backed vole	*Clethrionomys gapperi*
Montane vole	*Microtus montanus*
Long-tailed vole	*Microtus longicaudus*
Western jumping mouse	*Zapus princeps*
Coyote	*Canis latrans*
Gray wolf	*Canis lupus*
Red fox	*Vulpes vulpes*
Black bear	*Ursus americanus*
Raccoon	*Procyon lotor*
Pine marten	*Martes americana*
Short-tailed weasel	*Mustela erminea*
Striped skunk	*Mephitis mephitis*
Northern river otter	*Lutra canadensis*
Mountain lion	*Felis concolor*
Bobcat	*Lynx rufus*
Elk	*Cervus elaphus*
Mule deer	*Odocoileus hemionus*
White-tailed deer	*Odocoileus virginianus*
Moose	*Alces alces*

Domestic Species

Common Name	Scientific Name
Domestic chicken	*Gallus gallus*
Domestic cat	*Felis catus*
Domestic cattle	*Bovus taurus*
Domestic dog	*Canis familiaris*