ENVIRONMENTAL ASSESSMENT

WALLA WALLA DISTRICT PEST MANAGEMENT PROGRAM

Prepared by
Walla Walla District
U.S. Army Corps of Engineers

February 2013

CONTENTS

TABLES

FIGURES

1.0 INTRODUCTION AND BACKGROUND

This environmental assessment (EA) considers and describes the environmental effects of conducting pest management actions on U.S. Army Corps of Engineers (Corps), Walla Walla District (District) lands. As required by the National Environmental Policy Act (NEPA) of 1969, and implementing regulations created by the Council on Environmental Quality (CEQ), this assessment determines whether the proposed action is a "major Federal action significantly affecting the quality of the human environment" (42 USC § 4332), and whether an environmental impact statement is required. The information contained in this EA is of sufficient depth to define the nature and scope of the impacts associated with the proposed pest management related activities.

The District currently engages in a pest management program on approximately 154,000 acres of land and water it manages within Washington, Oregon, and Idaho (Figures 1-1 to 1-5). These lands include approximately 72,000 acres of land, of which 28,400 are forested habitat, 35,100 are semi-arid shrub-steppe, and 8,500 are park/recreation acres. The District also has riverine and riparian habitats associated with approximately 84,300 acres of reservoirs and 900 miles of river, ponds, and ditches. These lands are managed by the District for recreation, fish and wildlife purposes, and project operations (dams, levees, fish passage facilities, buildings, etc.).

The District pest management program is focused on three categories of pests: noxious and nuisance weed species, vertebrates, and arthropods. Species which come under these categories have been deemed a danger to human health, a safety hazard to the District's eight operating projects (Projects), and/or a major factor contributing to the devaluation of habitat lands established for fish and wildlife mitigation. The goal of the pest management program is to control and minimize/prevent the spread of pest species.

Noxious and nuisance weeds occur throughout the District and are defined according to the Class A, B, and C listed weeds for the State of Washington, Idaho, and/or Oregon. Other unlisted species such as: tree of heaven (*Ailanthus altissima*); Russian olive olive (*Elaeagnus angustifolia*); dandelion (*Taraxacum officinale*); and false indigo bush (*Amorpha fruticosa*) can also become pests.

Vertebrate pests include mammals (gophers, pocket gophers, ground squirrels, marmots, beaver, muskrats, deer, feral cats, mice, voles, skunks and raccoons). These pests sometimes burrow into levees and and other structures compromising their integrity and raising safety concerns. Vertebrate pests also include some waterfowl (e.g. Canada goose) that have become a nuisance in park and recreation areas used heavily by the public. Arthropod pests include such species as wasps, hornets, spiders, bees and ants.

Pests are treated in the District by Corps personnel, contractors, and lessees. Treatments by Corps personnel are typically limited to small, localized treatments of arthropods that may pose a safety risk to personnel or the public on Corps lands. Corps personnel also provide contract oversight for large-scale treatments made by contractors conducting pest management activities for the Corps on its lands (project operations lands, wildlife habitat lands, Corps levees, Corps recreation lands, etc), or at its facilities. Treatments undertaken by contractors are driven by

Corps mitigation requirements and safety and maintenance needs. Treatments made by lessees (or their contractors) on outgrant lands are typically limited to specific needs (i.e. golf course management, lawn maintenance, etc), and are driven by aesthetics and safety. Chemical, biological, and manual/mechanical methods are currently used to manage and control pests.

Chemical pesticides have been used to treat all categories of pests and include herbicides, insecticides, and rodenticides. They are applied using a variety of methods such as hand application, spot spraying, and broadcast treatments using a variety of tools, including paint brushes, backpack sprayers, vehicle-mounted sprayers and aerial applications. Approximately 18% of the chemical treatments are carried out by motorized techniques (e.g. all terrain vehicle (ATV) or a small tractor with a boom sprayer) and about 35% are done using a backpack sprayer.

Vehicle-mounted applications have been made with sprayers attached to ATVs, trucks, tractors, or boats. Aerial applications are made from sprayers attached to helicopters and are done infrequently on larger tracts of steep, rugged land with no road or trail access. About 36% (2,275 acres) of the total area sprayed in the District in 2008 -2009 was done by helicopter.

The majority of pesticide use in the District has been herbicide treatment of weeds on areas adjacent to recreation areas and roads that pose a risk of wildfire or to treat weeds which negatively affect recreation. In a typical year, the District's operating projects (Projects) have treated about 3,200 to 3,600 acres of terrestrial weeds. Every 2 to 3 years, 1,200 to 1,350 of the terrestrial acres would be treated with helicopter application of herbicides. The District has also treated 60 - 80 acres of aquatic weeds every year; only one over-water aerial application has occurred in the last 14 years. (Note: Aquatic applications are analyzed herein under NEPA, but require added analysis and consultation under the Endangered Secies Act before the District could employ aquatic pesticides.)

Insecticide applications have been typically made using aerosol cans, or with a backpack sprayer in localized areas. Rodenticide applications are typically made using baits placed into burrows, generally in and around Corps levees.

Biological control has consisted of introducing a natural pathogen, such as an insect, virus, or mold, which specifically targets only one species in an environment. Biological control could also include targeted and controlled grazing when and where appropriate.

Manual/mechanical control has included activities such as the use of hand tools or machines to pull, cut or mulch; planting native vegetation to compete with weeds; and strategic application of prescribed fire. It has also included the use of traps or pellet rifles to remove or deter pests. About 600 acres per year have been treated by mechanical techniques such as mowing or hand digging.

Pest management activities on District lands have been conducted by the Corps and outgrantees (i.e. individuals/entities given approval for use of District land through the issuance of a Corps lease, license, permit, etc.). Pest management activities on Corps managed federal lands will continue to comply with applicable laws/regulations and the District's pest management

program/plan. The Corps' program has been ongoing and would continue as long as there are pest problems on lands that are owned, maintained, or administered by the District.

PURPOSE AND NEED

Pursuant to the Federal Noxious Weed Act of 1974 (Public Law [PL] 93-629), the Carlson-Foley Act of 1968 (PL 90-583), and Executive Order 13112 (Invasive Species, 1999), the District is required to control noxious weeds and invasive species on federal lands under its jurisdiction. General pest management activities are not addressed in other District NEPA documentation and pest management actions are not categorically excluded from NEPA analysis and documentation. Noxious and nuisance weeds hinder operations at parks and projects and lower the value of wildlife mitigation lands. Vertebrate pests sometimes burrow into levees and other built structures, compromising the integrity of the structures and raising safety concerns. Arthropods such as wasps and spiders are a health and safety issue for Corps employees and users of Corps lands and facilities. Together these three categories of pests can cause significant economic damage to lands, waters and facilities should they become established or be allowed to expand their populations without controls.

While the District has an established and on-going pest management program, there is presently no comprehensive plan in-place that provides guidance on how the program should operate, the best methods to use, or how best to carry out pest management activities. The District is therefore proposing to develop a comprehensive and integrated approach to its pest management program. The approach would need to ensure the District is compliant with applicable laws and regulations, can efficiently and effectively cover all District managed lands, is environmentally acceptable, provides for the safety of employees and the public, allows the District to fulfill its missions of flood risk reduction, navigation, hydropower, recreation, and fish and wildlife mitigation, and is economically feasible.

Engineering Regulation (ER) 1130-2-540 (Chapter 3) requires Corps Districts to develop and implement an Integrated Pest Management Plan (IPMP) for all Corps' fee owned lands. Integrated Pest Management is defined as:

> "A comprehensive approach to pest control or prevention in which a variety of pest control methods intended to prevent, destroy, or repel a pest are evaluated to determine their effectiveness, in combination with their degree of impact on the surrounding environment; and then selecting that management method, or combination of methods, which causes the least amount of environmental impact while at the same time accomplishing the specific pest control goals. Examples of these methods include non-chemical habitat manipulation, mechanical control, biological control, and chemical control."

As laid out in Chapter 3, it is the Corps' policy to perform integrated pest management on civil works projects in a manner which provides for the safety of the environment, the public and the pesticide applicator.

Attention should also be directed to the fact that the use of some pest control methods can have a negative effect on Endangered Species Act (ESA) listed species. Because of this situation,

whatever pest management approach the District selects would involve coordination with the National Marine Fisheries Service and the Fish and Wildlife Service. District lands are predominately located near rivers or streams containing ESA-listed fish species (e.g. salmon, steelhead and bull trout) and associated critical habitat. The District pest management program must both minimize impacts to ESA-listed species while satisfying its pest management obligations.

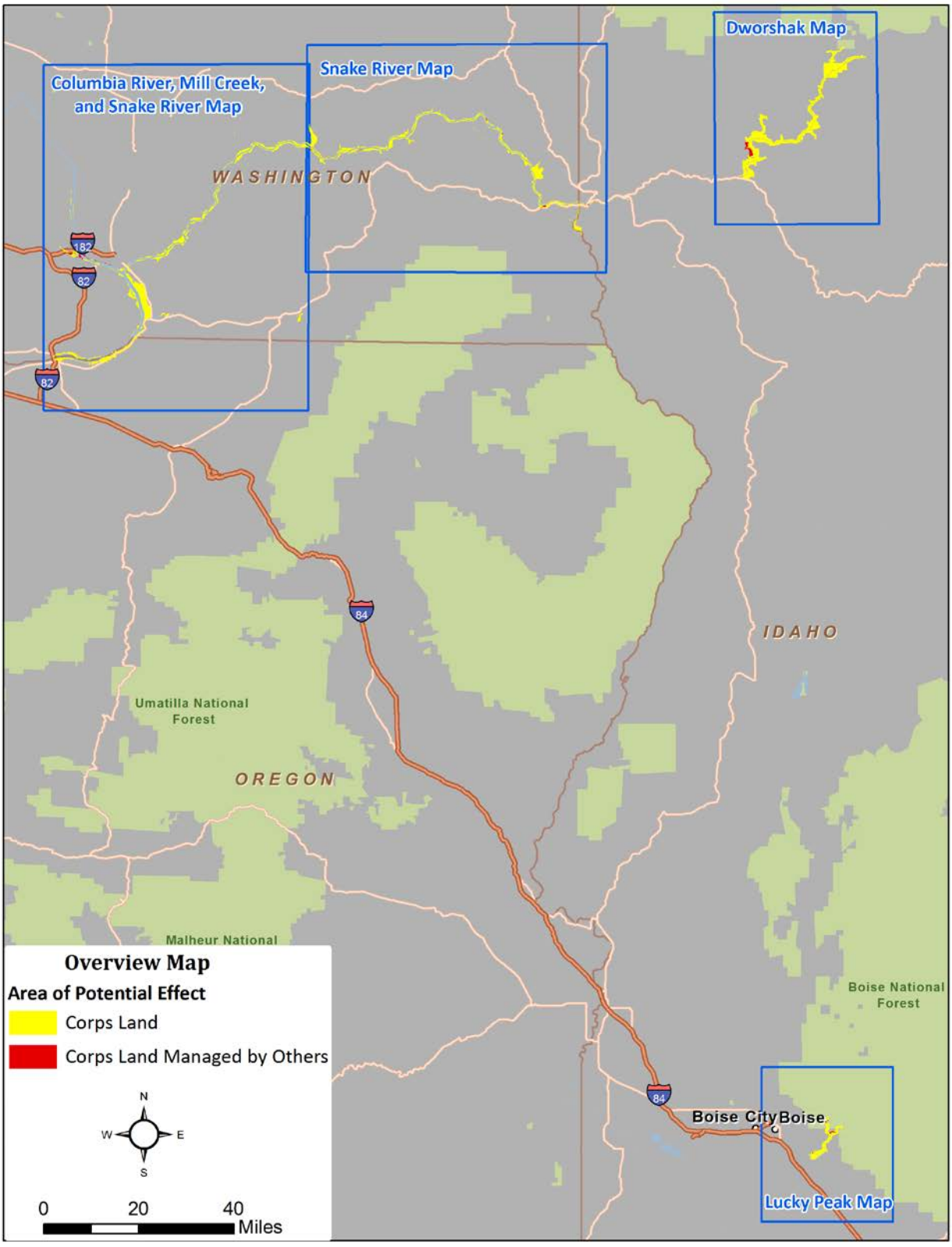


Figure 1-1. Overview map.

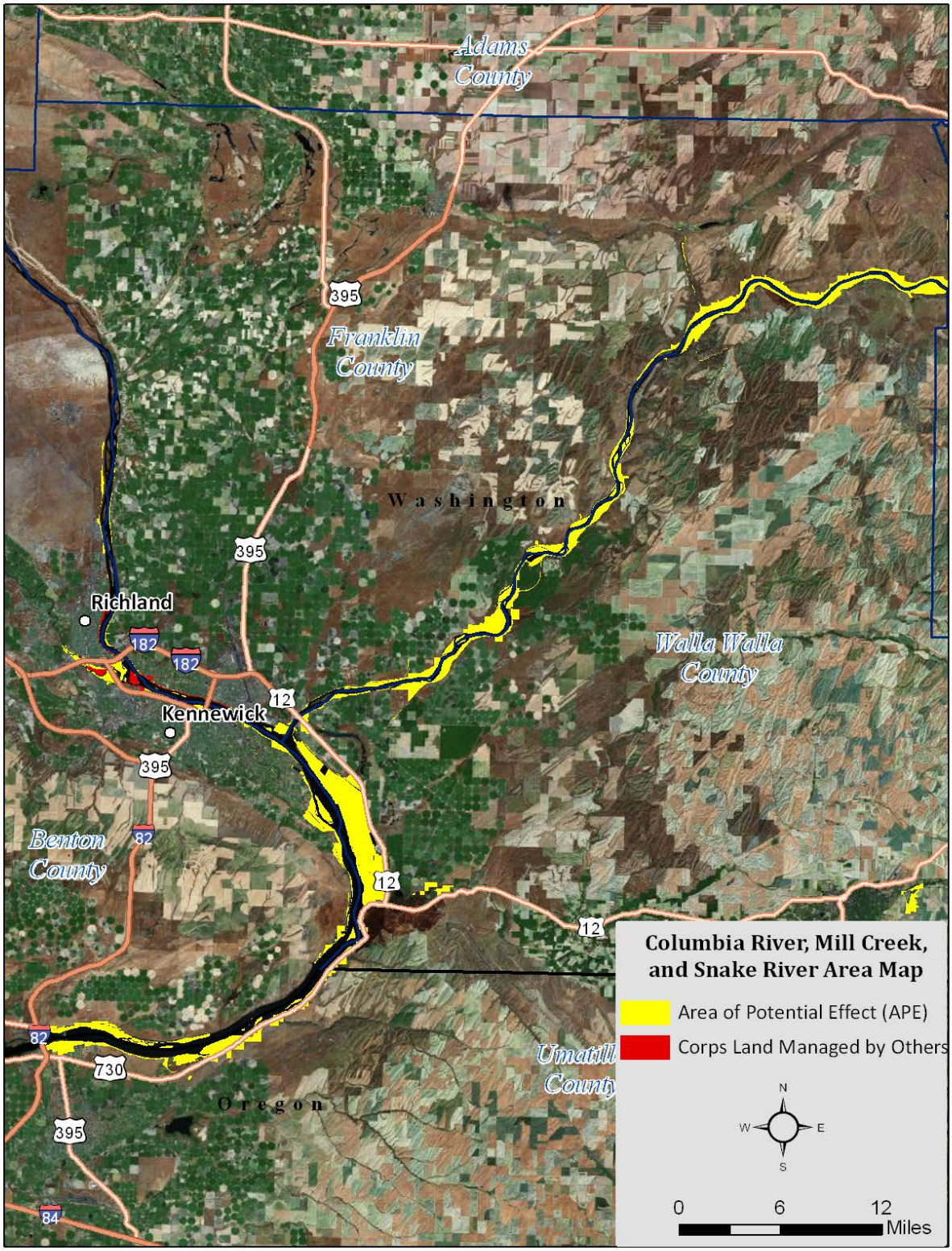


Figure 1-2. Columbia River, Mill Creek and Snake River area map.

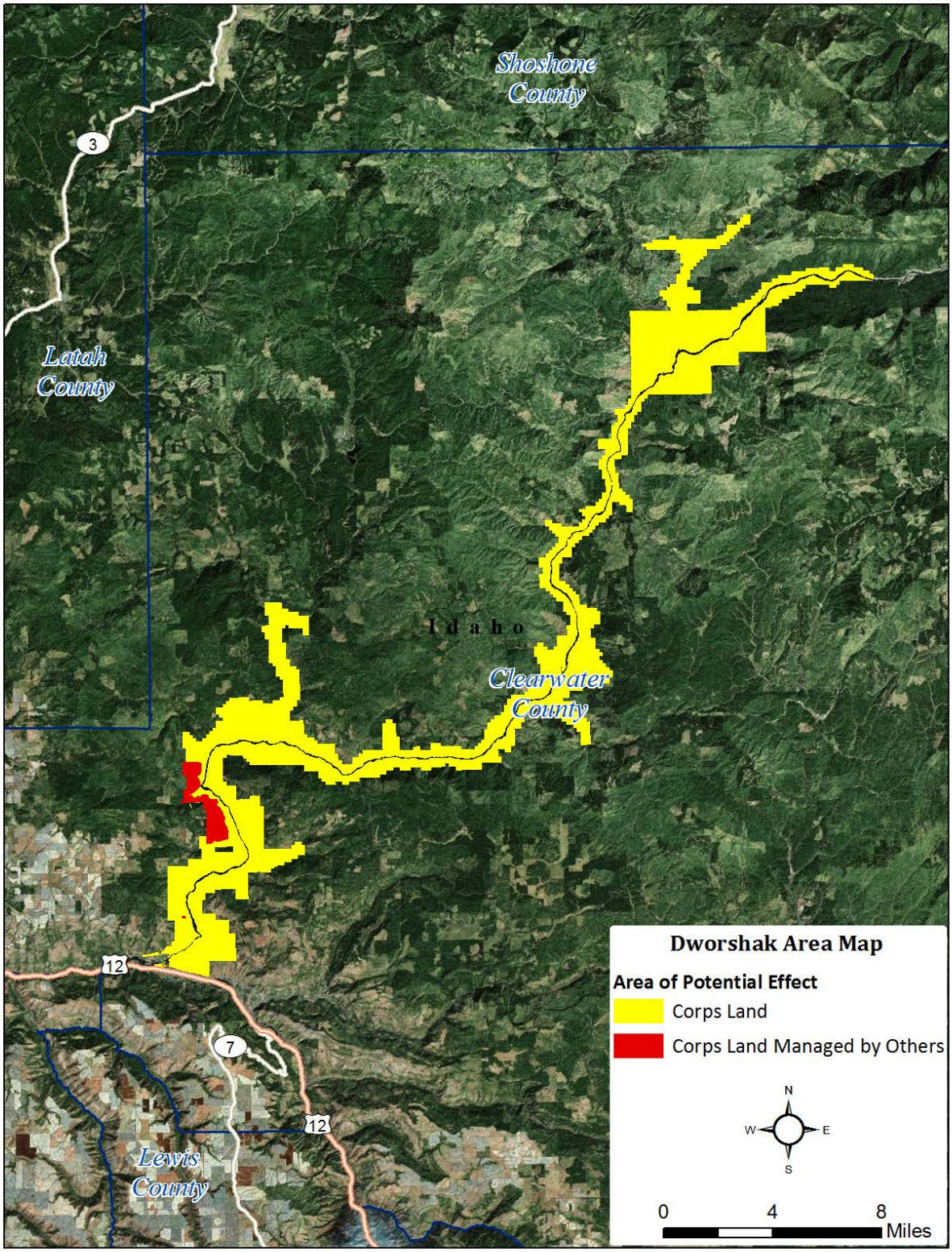


Figure 1-3. Dworshak area map.

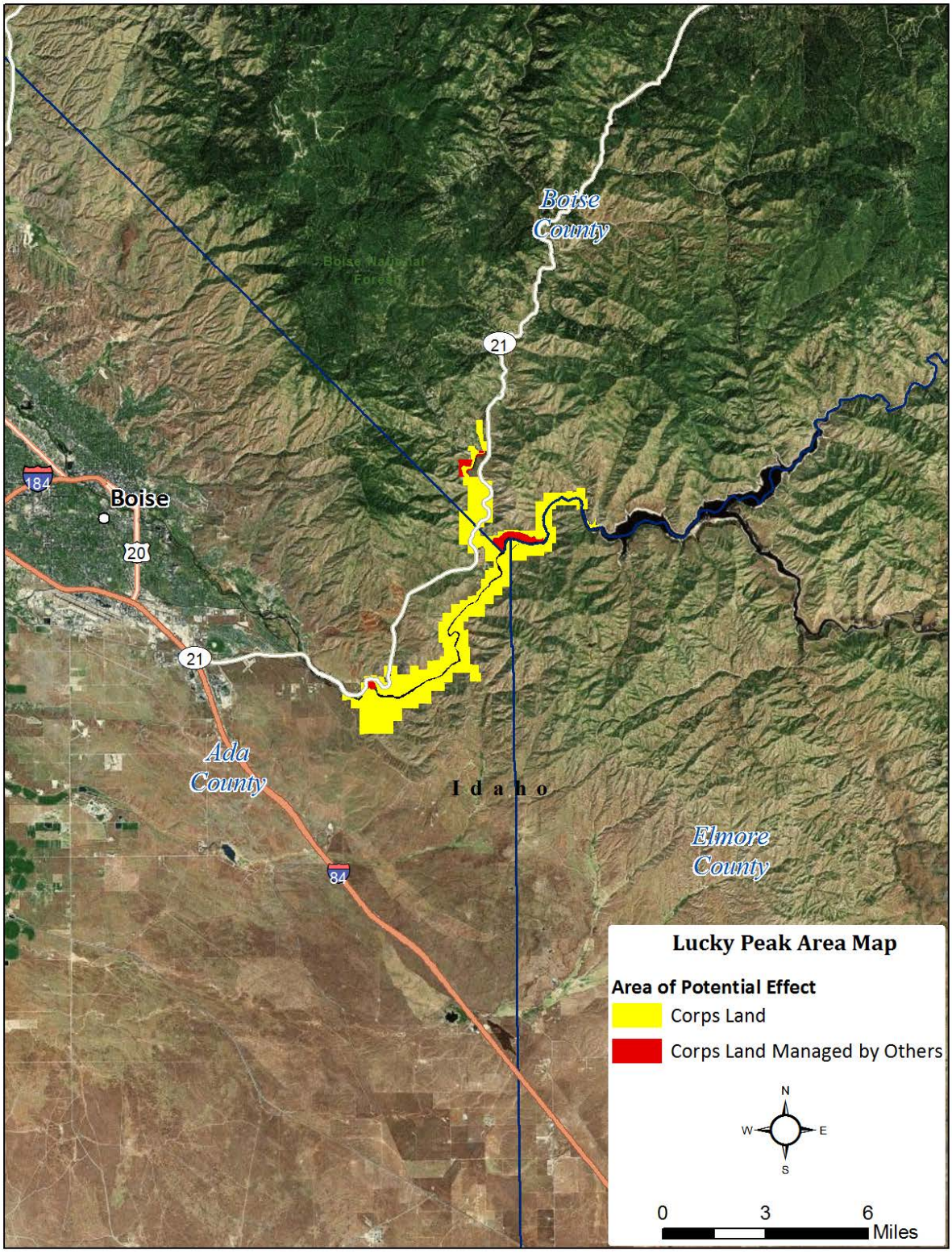


Figure 1-4. Lucky Peak area map.

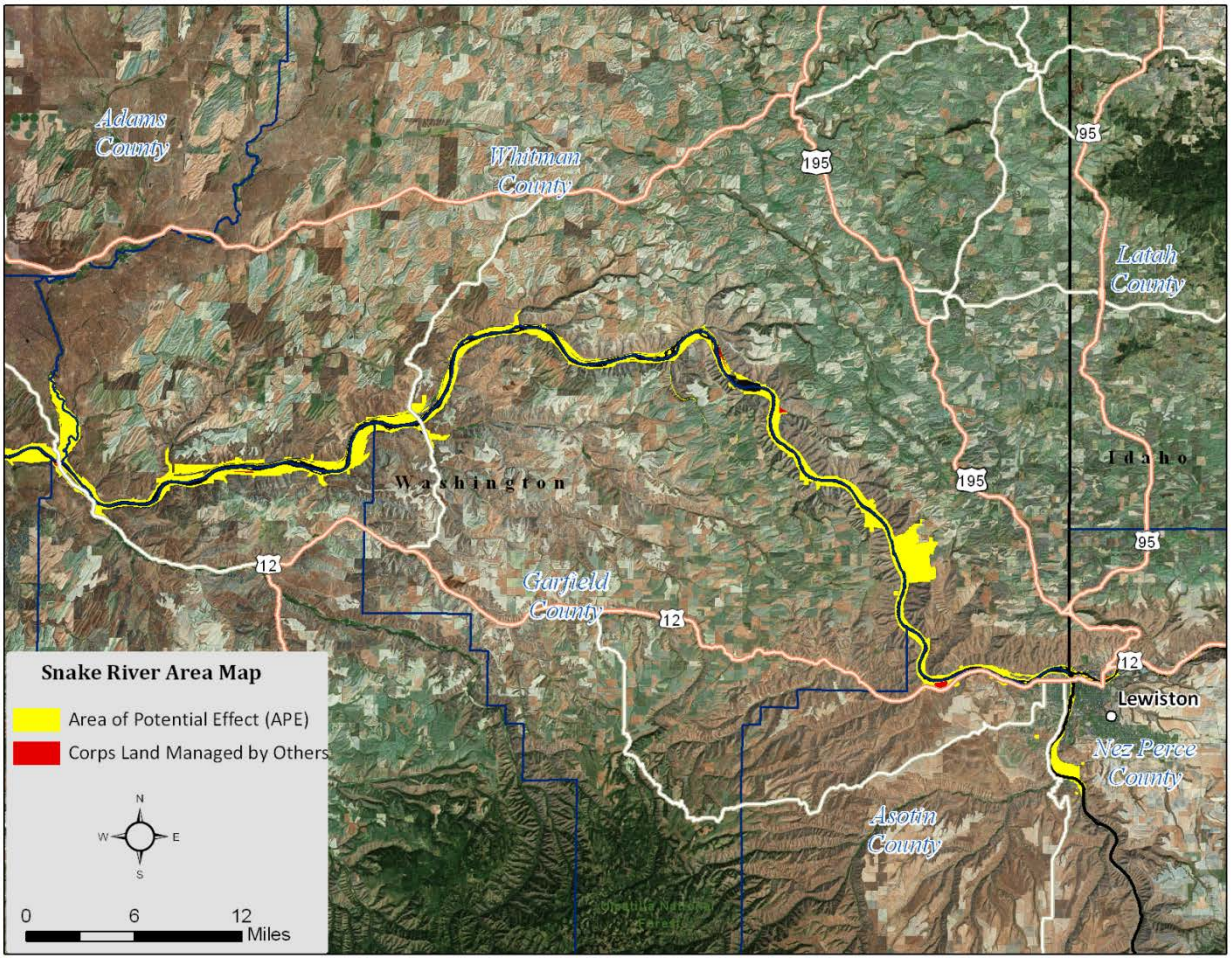


Figure 1-5. Snake River area map.

2.0 ALTERNATIVES

INTRODUCTION

This chapter describes a range of reasonable alternatives which address the purpose and need for action. Five alternatives were considered with two alternatives being carried forward for further consideration – i.e. no action and proposed action alternatives. This chapter also describes the three alternatives which were considered but dismissed from further consideration.

ALTERNATIVE 1 – NO ACTION (NO CHANGE) ALTERNATIVE

Under the "no action" alternative, the current pest management program in the District would continue (i.e., there would be no change) as discussed in Chapter 1 (management of weeds, vertebrates, and arthropods). Noxious and nuisance weed species, vertebrates, and arthropods would continue to be treated on Corps lands in terrestrial and aquatic environments using manual/mechanical, biological, and chemical (pesticide) control methods. The No Action Alternative is summarized as follows:

1. Does not employ an IPMP or effectively employ IPM procedures.
2. Pesticide applications are primarily guided by pesticide label requirements (as allowed under the Federal Insecticide, Fungicide, and Rodenticide Act [FIFRA]) but not in accordance with other Corps' policies and regulations, such as the requirement to develop and implement an Integrated Pest Management Plans (Engineer Regulation 1130-2-550, Chapter 3). This includes not employing best management practices which ensure the protection of sensitive resources.
3. Pesticide application data collection and documentation is not systematic and does not provide supporting information to establish overall pest management priorities or strategies.
4. There is no limit on the amount or type of pesticides employed. Over 40 pesticide active ingredients (hundreds of potential formulations and trade names) are employed.
    a. No limit on types of herbicides used.
    b. No limits on types of rodenticides used, typically by poison gas or bait.
    c. No limits on types of insecticides used, typically by man-portable sprayer.
5. Pesticide application methodologies:
    a. Tractor-based boom spray application for larger areas (typically multiple acre sites) such as food plots, or on open lands with gentle topography and along roadsides. This method employs large pesticide mix tanks (up to 500 gallons).
    b. Off-road vehicle-based boom and hand wand spray for smaller areas (TYPICALLY multiple acre spot spray or less than an acre boom spray) and areas of more difficult topography. This methodology employs smaller pesticide mix tanks (up to 50 gallons).
    c. Backpack or hand-carried bottle spray for spot treatments and very small areas or in areas of extremely difficult terrain where vehicles cannot be employed (can be multiple acre spot spraying, but typically less than an acre for monoculture treatments). This methodology employs very small pesticide mix tanks (up to 5 gallons).

6. Other methodologies:
    a. Lethal removal of rodents by any trap or rifle.
    b. Hazing of waterfowl or egg addling in waterfowl nests.
7. Pesticides would be chosen by those individuals/groups making applications throughout the District subject to FIFRA requirements. Treatments would occur as needed throughout the year in any of these areas, but typically only once or twice per site. Treatments would also continue to be managed on a local (operating project) level.
8. Focuses primarily on approximately 8,000 acres per year of Corps-managed lands which are the most heavily impacted by pest infestation and which are commonly found in recreation (including marinas), wildlife, and project operations areas. It emphasizes chemical methods for approximately 90 percent of the treatments before considering biological and manual/mechanical management. It is an approach with known costs that has evolved from past practices into a situation where implementation processes are known and expected results are achieved.
9. The "no action" alternative does not satisfy the project purpose and need but will be carried forward in this environmental assessement as a baseline for comparing the management direction and environmental consequences of the other alternatives.

ALTERNATIVE 2 – NO TREATMENT ALTERNATIVE

Under the "no treatment" alternative, the pest management program in the District would not continue (i.e., there would be no pest management activities whatsoever). This approach would result in no chemical application and therefore no environmental impacts from chemical application, either beneficial or detrimental. Although no acres would be treated, there would be impacts associated with this alternative due to pest damage to facilities and habitats. For example, burrowing mammals at levees could lead to structural damage that would require rehabilitation. This alternative fails to address the Corps' obligations to comply with federal weed management laws. This alternative also fails to address pest damage to habitats and facilities or health and safety issues.

ALTERNATIVE 3 – CHEMICAL TREATMENT ONLY ALTERNATIVE

Under the "chemical treatment only" alternative, the federal action would be very similar to that under the "no action" alternative, with treatment tools being limited to chemicals only. This pest management approach would also focus primarily on 8,000 acres per year of Corps-managed lands that are the most sensitive to the impacts of pest infestation commonly found in recreation, wildlife, and project operations areas. It emphasizes chemical methods for 100 percent of the treatment options. It is an approach with known costs that has also evolved from past practices into a situation where implementation processes are known and expected results are achieved. This alternative is likely more cost effective than the "no chemical" alternative. It does control pests and it ensures that the Corps meets its obligation to comply with federal weed management laws. However, this alternative does not comply with IPMP policy requirements (ER 1130-2-540, Chapter 3, Section 3-3) and may not be technically feasible in all cases.

ALTERNATIVE 4 – EVERYTHING BUT CHEMICAL TREATMENT ALTERNATIVE

Under the "everything but chemical" alternative, the pest management program in the District would change dramatically as there would no longer be any chemical treatments. This would result in pest management activities under this alternative being much more labor intensive and costly and would result in significantly fewer acres treated per year than alternatives that include chemical application. Therefore, the 8,000 acres per year of Corps-managed lands that are the most sensitive to the impacts of pest infestation would not be completely treated. This alternative would emphasize manual/mechanical and biological methods as the next most effective treatment options but would require more frequent treatments to be effective.

ALTERNATIVE 5 – INTEGRATED PEST MANAGEMENT ALTERNATIVE

This alternative is similar to the no action alternative above with the following exceptions:

1. Develops an IPMP and fully employs an integrated pest management approach on Corps' lands henceforth.
2. Includes best management practices, improved methods of employment and buffer zones around sensitive resources to minimize potential environmental impacts.
3. Reduces the number of pesticides (herbicides, rodenticides and insecticides) employed to only those known to have minor environmental impacts. (NOTE: The primary test used to determine significance of environmental impacts would be ESA biological assessment and subsequent consultation with the Services (i.e. NMFS and USFWS). The goal is to employ methods which are not likely to adversely affect listed species, or methods and chemicals that would be tailored to minimize adverse effects to ESA-listed species, critical habitats and other sensitive or protected resources, but would still effectively treat pests.)
4. Increased oversight and guidance from the District, with improved integration and consistency with overall IPMP objectives. Concise standardized documentation of Corps pest management actions, to specifically include chemical treatments (record keeping), will be consistent and sufficient to inform future pest management decisions on priority, strategy and resource allocation. Such data collected will be sufficient for regulatory agency long-term effects evaluation needs. Provide greater flexibility in pest management through the IPMP and greater accountability and record keeping on a District-wide level.
5. The District pest management program would be more likely to extend beyond the historically treated 8,000 acres per year described in the no action alternative. It would ensure analysis and prioritization of pest management issues on all District lands. It is a known approach (based on local and national past practices), with known costs and with known results.
6. Pesticide application would be restricted beyond pesticide label requirements when appropriate to minimize adverse effects to ESA-listed and other protected species, and would continue to be done in accordance with Corps regulations and policies. (See Appendix C.)

Best Management Practices

The Corps proposes the use of conservation measures developed under biological assessment and consultation and will incorporate them as environmental best management practices (BMPs) integral to the preferred alternative, with the intent of minimizing potential adverse impacts related to the implementation of chemical applications. These BMPs are not mitigation, but are integral (hence 'integrated') to the IPMP process and support the prevention of and reduction in potential impacts of this alternative, and are considered when analyzing the potential impacts.

The Corps has developed 33 specific impact minimization measures that would be implemented as standard operating procedures with the proposed integrated pest management program. These measures, shown in Appendix B, all apply to chemical application methods and address the following general areas:

- Safety and spill control;
- Regulatory compliance;
- Equipment suitability;
- Dosage and application rates;
- Environmental conditions;
- Documentation and reporting;
- Monitoring; and
- Material restrictions.

In addition to the BMPs developed from conservation measures, the following BMPs would also be implemented to prevent erosion, restore native vegetation, and to help slow or stop the proliferation of weeds:

- The topography of land, following any Corps' action, would be returned to a pre-work state, to include removal of ruts, leveling of mounding, and obliteration of any access roads deemed unnecessary for long-term operations and maintenance. The area would be shallowly disked or harrowed and hand raked, or hand pulled to remove all large weeds and skeletons from previous year's weeds. Replanting with established plants would occur as appropriate for replacing trees and shrubs removed as part of ground disturbing actions.
- The entire impacted area would be immediately seeded with an appropriate native or naturalized seed mix. The Corps would use native (preferred) or naturalized (if other preferred seed is unavailable or inappropriate for the land management objectives) desirable seed appropriate to the area, typically with the greatest potential habitat value.
- Post-site restoration weed control would continue as needed (typically for 2 years minimum) and herbicidal control for the following weeds would be emphasized as high priority: Canada thistle, scotch thistle, bull thistle, yellow star, knapweed species, rush skeletonweed, field bindweed, Dalmatian toadflax, camelthorn, water hemlock, kochia, purple loosestrife, and punture vine.
- All invasive, nonnative riparian vegetation (i.e. Russian olive) that is treated by any means would be monitored for two years following treatment and re-treated as needed to ensure control.

SCREENING OF ALTERNATIVES

The Council on Environmental Quality (CEQ) regulations for implementing NEPA require that federal agencies explore and objectively evaluate a reasonable array of alternatives. In this section, screening criteria developed by the District are uniformly applied to each of the identified alternatives. This process helps to determine how well each alternative addresses the project purpose and need and also provides the justification/rationale for eliminating any alternatives that were not considered in detail (CEQ 1502.14).

The following criteria were determined critical for meeting the project purpose and need and were used in the screening process.

1. Compliance with all appropriate federal laws, regulations and policies (particularly federal weed laws and policies);
2. Minimization of hazards caused by pests while pest control is performed safely;
3. Technical and economic feasibility (incorporate proven and cost effective pest control methods;
4. Support of recreation, operational goals and objectives, and established District habitat mitigation requirements; and
5. Environmental acceptability (complies with federal environmental compliance laws)

PREFERRED ALTERNATIVE

Table 2-1 presents the application of screening criteria to alternatives that were considered for implementation. The proposed action was the only alternative that met all criteria and is carried forward for analysis in the environmental assessment as the preferred alternative. The "no action" alternative does not meet the screening criteria requirements, but is carried forward for analysis to provide baseline conditions. The other considered alternatives did not meet all the objectives of the screening criteria and were eliminated from further analysis. The rationale for elimination is summarized in Table 2-1 detailed below.

Table 2-1. Integrated Pest Management Plan Screening Criteria

Alternative	1. Weed Law and Policy Compliance	2. Hazard Minimization and Safety	3. Feasibility	4. Support for Recreation, Operations, Habitat Mitigation	5. Environmental Compliance
1-No Action	No	Yes	Yes	Yes	No
2-No Treatment	No	No	Yes	No	No
3-Chemical Treatment Only	No	Yes	Yes	Yes	Yes
4-Everything but Chemical Treatment	No	No	No	No	Yes
5-IPMP	Yes	Yes	Yes	Yes	Yes

Alternatives Considered but Excluded from Further Consideration

Alternatives 2, 3 and 4 were considered but excluded from further consideration for the following reasons.

Alternative 2 – No Treatment Alternative

The "no treatment" alternative fails to address the Corps' obligations to comply with federal weed management laws, Corps regulations and policy, and environmental compliance laws, as such an agency approach/decision would not be consulted on under the ESA. The failure to comply with environmental laws makes this alternative environmentally unacceptable. This alternative also fails to address pest damage to facilities and habitats or safety issues.

Alternative 3 – Chemical Treatment Only Alternative

The "chemical treatment only" alternative fails to comply with Corps regulations and policy regarding the development and employment of integrated pest management plans.

Alternative 4 – Everything but Chemical Treatment Alternative

The "everything but chemical" alternative fails to comply with Corps regulations and policy regarding the development and employment of integrated pest management plans and fails to minimize pest hazards and due to added costs, would not be economically feasible. This alternative fails to effectively support recreation, operational goals and objectives, and established mitigation requirements.

ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS

Alternatives 1 (no action) and 5 (integrated pest management (preferred alternative)) are carried forward for analysis and more detailed discussion in Chapter 3. Table 2-2 shown below summarizes the main differences between Alternative 1 and Alternative 5.

Table 2-2. Differences between the No Action and IPM Alternatives

Alternative 1 – No Action	Alternative 5 – IPM Alternative
General	
Does not employ an integrated pest management plan and therefore does not comply with Corps policy requiring this document.	Employs an integrated pest management plan and therefore complies with Corps policy.
Pesticide applications limited only by label requirements.	Pesticide application limited by label requirements, BMPs and buffers around sensitive resources. BMPs designed to reduce or avoid impacts to ESA-listed species and critical habitats.
Inconsistent data collection and documentation techniques across Corps lands.	Consistent and sufficient data collection and documentation of chemical treatments for recording purposes and to inform future

	weed management decisions.
Nuisance and Noxious Plants (Weeds)	
Unlimited herbicides for treating weed pests which have not been consulted on by the Corps for use (for ESA or NHPA compliance) and whose environmental effects are largely unknown.	Use of 13 active herbicide ingredients is proposed, all of which have been through ESA and NHPA consultation, and the effects are known. Any new ingredients could only be employed if further environmental analyses and consultations were to occur.
Vertebrate Pests	
Unlimited rodenticides for treating vertebrate pests, which have not been consulted on by the Corps for use (for ESA or NHPA compliance) and whose environmental effects are largely unknown.	Use of 2 active rodenticide ingredients is proposed, both of which have been through ESA and NHPA consultation, and the effects are known. Any new ingredients could only be employed if further environmental analyses and consultations were to occur.
Arthropod Pests	
Unlimited brand names available for treating arthropod pests, which has not been consulted on by the Corps for use (for ESA or NHPA compliance) and whose environmental effects are largely unknown.	Use of 3 active insecticide ingredients is proposed, all of which have been through ESA and NHPA consultation, and the effects are known. Any new ingredients could only be employed if further environmental analyses and consultations were to occur.

3.0 ENVIRONMENTAL ANALYSIS

This chapter describes environmental resources/components, describes the affected environment and the potential environmental impacts of the No Action and Preferred Alternatives.

DISMISSED ENVIRONMENTAL COMPONENTS

Fourteen environmental components/resources were identified as being relevant to this project – air quality, noise, transportation, climate change, floodplains, socioeconomics, environmental justice, topography and soils, aesthetics, cultural resources, recreation, habitats (e.g. wetlands) and species (including threatened and endangered species), water quality and cumulative effects. However, after review and initial assessments of potential impacts to environmental components, only cultural resources, recreation, habitats and species, water quality, and cumulative effects were identified as needing further assessment including consultation and/or coordination with other federal, state and tribal regulatory entities. Environmental components that were dismissed from further analysis are briefly discussed below and the rationale for their dismissal is provided.

Air Quality. The Environmental Protection Agency (EPA) has designated all counties potentially affected by the proposed action to be in attainment – i.e. meet non-pollutant criteria (USEPA 2012). Pest management activities would not introduce any new stationary sources of air emissions to the region or contribute to a violation of any federal, state, or local air regulation. Further, the Corps would employ standard IPM best management practices (BMPs) for pesticide applications to include the use of additives to reduce evaporation or volatilization as well as sizing of nozzles to produce larger droplets and orienting of nozzles to reduce or prevent spray drift of pesticides. These BMPs further assure the protection of air quality. Application of pesticide sprays and emissions would occur throughout a project area that is mostly rural or remote. Air quality impacts would be negligible and are not analyzed in further detail in this EA.

Noise. Neither alternative would cause any appreciable changes in the noise environment, nor would noise levels exceed federal, state, or local government standards. The use of aircraft (helicopters) for aerial spraying, motorized equipment and vehicles and the discharging of firearms would generate transient increases of noise in areas that are rural or remote and would be dispersed throughout the project area, similar to surrounding agricultural and rural activities. Noise impacts would be negligible and are not analyzed in further detail in this EA.

Transportation. The two alternatives would cause a minute increase in the number of aircraft (helicopter) operations during the infrequent aerial applications of pesticides and in vehicle traffic. These increases would not substantially change the air operations at any airport or traffic volume on any roadway. Transportation in the project area would not exceed federal, state, and/or local government standards. The pest management activities supported by vehicular traffic would be similar to those of surrounding lands for agricultural and rural activities. There would be no changes in transportation infrastructure or road closures. Transportation impacts would be negligible and are not analyzed in further detail in this EA.

Climate Change. The alternatives have no activities that produce significant emissions and would not be subject to quantitative analysis. Mechanized equipment would be utilized to spread herbicides or pesticides, but use would be infrequent and the equipment would be small in size

and number. The pest management activities supported by vehicular traffic would be similar to those of surrounding lands for agricultural and rural activities. Therefore, climate impacts would be negligible and are not analyzed in further detail in this EA.

Floodplains. The No Action and Preferred Alternative activities would occur at least in part in floodplains, but the project does not involve any construction of impermeable or permanent surfaces that would increase flood flows. Substantial clearing of large plants like trees could affect the floodplain capacity but is beyond the scope of the purpose and need of this analysis and would be assessed separately on a case-by-case basis. Other proposed activities such as mammal and arthropod control would not alter the floodplain's capacity. Therefore, floodplain impacts would be negligible and are not analyzed in further detail in this EA.

Socioeconomics. The alternatives would change neither the total number of full-time equivalent jobs nor the funds available for pest management contracts in the District. Likewise, the alternatives would not create additional jobs or result in the loss of jobs, alter new wages, alter the characteristics of the population in the project areas, or impact the local economy. Therefore, socioeconomic impacts would be negligible and are not analyzed in further detail in this EA.

Environmental Justice. Pest management activities re tied to industry standard health and safety protocols that minimize hazardous exposure to applicators and nearby populations, so there would be no adverse effect on human health and safety and no disproportionate adverse impacts on minority and low-income populations. Further, IPM inherently seeks to lessen the potential environmental effects from pesticides and reduce the risk factors in the remote and rural areas that are the primary concern of the proposed action. Therefore, environmental justice impacts would be negligible (positive for the preferred alternative), and are not analyzed in further detail in this EA.

Topography and Soils. The alternatives involve activities which occur at the ground surface or just above it in the instance of aerial application of pesticides. There is no alteration of the topography caused by the performance of these activities. Further, the Corps has developed and routinely utilizes soil protecting BMPs during performance of pest management activities. Therefore, topography and soils impacts would be negligible and are not analyzed in further detail in this EA.

Aesthetics. The alternatives primarily occur in sparsely populated rural or remote areas and relatively few people experience the aesthetics of the locations, or close up. Some minimal short-term negative aesthetic effects of weed management could be experienced on Corps' land in the Tri-Cities and Lewiston-Clarkston areas. Waterfowl, noxious weed and arthropod control actions that would be aesthetically beneficial would be carried out in recreation areas. Localized aesthetic effects of pest management would be minimal and short-term, while long-term aesthetics of the project area would be improved. Overall aesthetics impacts would be negligible and are not analyzed in further detail in this EA.

THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The intent of this section is to identify and describe the environmental resources/components on Corps-managed lands within the District which could be affected by implementing either the "no

action" alternative or the "preferred" alternative and therefore warrant further discussion. Many of these environmental components are divided into terrestrial and aquatic subcategories for clarity of analysis.

Cultural Resources

Affected Environment

District managed lands include portions of two major culture areas: the southern Plateau and the northern Great Basin (Walker 1978 & 1998; D'Azevedo 1986). The Columbia and Snake Rivers traverse these culture areas and have been the focus of occupation for millennia as is evidenced by the number of archaeological sites identified on District lands. Historic sites are also common and themes include exploration, mining, transportation, and European settlement. Given the extent of lands managed by the District and their span of multiple cultural areas, a full overview of the culture history of the project area is not provided in this document. There are a variety of detailed culture histories and cultural chronologies available for these regions (Daugherty 1960 & 1962; Leonhardy and Rice 1970; Ames and Marshall 1980; Jennings 1985; Reid 1991; Ames and Dumond 1998; to name a few). Instead, this section provides an overview of previous surveys and known cultural resources on District lands, and Tribal interests in District lands and projects.

There have been numerous cultural resource investigations within District project lands. These include investigations for inventory, evaluation and mitigation of archaeological sites, research, cultural overviews, and Section 106 compliance efforts. Not all of the land within the District is available for cultural resource survey, some is too steep (over 40 degree slopes) or inundated. When this is taken into account, there are 79,545 acres where cultural resource inventory is possible. Table 3-1 summarizes the acres previously surveyed by project, including reconnaissance survey.

Table 3-1. Summary of Previous District Cultural Resource Investigations

Project	Acres Available for Survey	Reconnaissance Survey	Surveyed to Standard*	Percent Surveyed
McNary	13,409	561	5,716	47%
Ice Harbor	6,463	298	4,398	73%
Lower Monumental	10,413	0	8,735	83%
Little Goose	6,018	111	2,702	47%
Lower Granite	9,183	266	3,252	38%
Dworshak	29,290	2,061	591	10%
Mill Creek	503	--	25	5%
Lucky Peak	4,266	--	100	2%
TOTAL	79,545	3,297	25,519	36%

These previous investigations have documented a total of 1,449 cultural resources located on District-managed lands. These sites range from prehistoric sites that date to over 10,000 years old to historic sites associated with the construction of the dams and other related infrastructure.

Because the District spans primarily three states, each of which has different standards for recording sites, some of these sites are actually isolated finds. Archaeological sites are ubiquitous because the District manages lands adjacent to major waterways in Washington, Idaho, and Oregon.

Cultural resources also include traditional cultural properties (TCPs) within the project area. TCPs are also referred to as Historic Properties of Religious and Cultural Significance to Indian Tribes (HPRCSITs) because it is legally defined in the National Historic Preservation Act (NHPA). HPRCSITs can be important to Tribes for a number of reasons including their ongoing importance as places where gathering of natural resources occurs. The collection of plants for food, construction, or ceremonial use occurred throughout the area prior to land management by the District. Whether or not plant collection is an integral aspect of HPRCSITs on District lands is somewhat unknown as the information is culturally sensitive and not commonly shared. Therefore, the effects of pest management activities on HPRCSITs must be determined through consultation with the affected Tribes.

The District routinely consults with seven Native American Tribes: the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Confederated Tribes of the Colville Reservation (CCT), the Confederated Tribes and Bands of the Yakama Nation (YN), the Nez Perce Tribe, the Shoshone-Bannock Tribes of the Fort Hall Reservation (Sho-Ban), the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation (Sho-Pai), and the Wanapum. The Wanapum are not a federally recognized tribe but they are often included in consultation due to their interest and connection to District lands.

Environmental Consequences

No Action Alternative

Under the no action alternative the current pest management program would continue. The majority of these activities, which focus on the use of pesticides and herbicides, would have no adverse impacts on cultural resources. All other pest management activities that have the potential to impact cultural resources would go through case-by-case review to determine the level of impacts in accordance with Section 106 of the NHPA.

Integrated Pest Management Alternative (Preferred)

As part of the Section 106 consultation process, District archaeological staff made a determination of "No Adverse Effect" for the integrated pest management program and received concurrence from the Washington, Oregon and Idaho SHPOs. Also included in the consultation process were the following activities which were determined to have no effect on cultural resources provided certain conditions were met. These conditions were agreed upon by the Oregon, Washington and Idaho State Historic Preservation Officers (SHPO).

- All chemical treatments (including spot and broadcast spraying methods) which do not violate the chemical label, regardless of the pest species being treated: Conditions include no ground disturbance, no cultural features present such as pictographs or petroglyphs, Tribes notified prior to aerial spraying, and cross country travel for application purposes only occurs under conditions which do not lead to rutting.

- Manual and mechanical treatment of rodent and waterfowl, including trapping, shooting and noise deterrents: Conditions include no ground disturbance and no movement, removal or alteration of rocks.

- Hand thinning branches and small trees and brush removal using hand mechanical or manual tools: Conditions include no ground disturbance, no culturally modified trees are removed, material is dropped in place or removed by means which will not cause rutting, and large vehicles such as dump trucks are staged on existing roads, trails or landscaped lawns.

- Controlled grazing of goats or sheep to manage weed populations: Conditions include periodic monitoring of archaeological sites to ensure ground disturbance is minimal.

- Mechanical mowing and fertilization of landscaped areas and lawns: Conditions include no ground disturbance.

- Manual weed control (e.g. hand pulling of weeds within landscaped areas such as parks or around facilities): Conditions include ground disturbance limited to individual plants and the top 12 inches of soil.

- Tilling and weeding existing landscaped flowerbeds using a shovel or small tiller: Conditions include tilling/weeding occurring within an existing landscaped feature and ground disturbance limited to the area previously disturbed (approximately top 12 inches of soil).

While the District received SHPO concurrence on its "No Adverse Effect" determination, it also recognized that some of the actions considered as a part of the Integrated Pest Management alternative would require separate consultation because of their potential to impact cultural resources (e.g. prescribed burning). The IPMP would detail those pest management activities which have been cleared for implementation without requiring further cultural resources review and assessment (e.g. those listed above). If the proposed pest management activity isn't identified/listed in the IPMP, a District staff archaeologist would need to contacted. Because these non-listed actions would be subject to additional review prior to being implemented, the overall Integrated Pest Management Alternative would not significantly impact cultural resources.

To date, Tribal consultation has not identified HPRCSITs which would be impacted by the actions included in this alternative. There was some concern raised about the use of chemicals to mange plant pests and possible exposure of people collecting resources to these chemicals. The CTUIR noted that they have worked with the Forest Service to develop a notification process that allows them to inform Tribal members what areas have been treated. The District's IPMP will address any notification procedures that result from ongoing consultation with the Tribes.

Recreation

Affected Environment

The Corps operates 37 recreation areas along the numerous rivers and lakes in the District. These include visitor centers, campgrounds, picnic areas, playgrounds, beaches, marinas, boat launches, day-use parks, and nature trails. Additionally, other government agencies and private entities operate more than 30 recreation areas on Corps land along regional rivers and lakes. Each year the District has more than 8 million visitors who come to enjoy many recreational opportunities including fishing, camping, boating, picnicking, swimming, sightseeing, and bird watching (USACE, No Date).

Recreational areas account for approximately 12 percent, or 8,444 acres, of the project area in the Columbia River, Snake River, Dworshak, Lucky Peak, and Mill Creek Action Areas (USACE, 2012). Dispersed recreation occurs throughout Corps lands. The expectations of recreational users are based on the settings of the park or landscape. For example, hikers on a primitive mountain trail would experience greater disruption from a manmade structure in the view, such as a cell phone tower, than would people engaged in water recreation at a populated lake. The recreational facilities in a populated lake area are more developed and recreational users would expect to see evidence of human activity, such as pest management.

Environmental Consequences

No Action Alternative

Terrestrial Recreation:
In implementing pest management activities, recreational users could be temporarily excluded from treatment areas undergoing herbicide treatments for safety and health reasons. This temporary exclusion would be an inconvenience to recreational users. The presence of personnel and machinery performing pest management activities could detract from the recreational experience through visual and auditory intrusions but these would only be temporary. These short-term interruptions and pest management activity encounters currently occur, so there would be no change in impacts to recreation by implementing the no-action alternative.

Aquatic Recreation:
The proliferation of invasive and unwanted aquatic vegetation in surface waters can negatively affect boating, fishing and swimming opportunities by overgrowing/infesting these areas. Use of aquatic herbicides and mechanical means to remove aquatic weeds could improve recreational opportunities and enhance recreational experiences. There could be short-term negative effects due to area closures while treatments are underway. However, the impacts of pesticide exposure are extremely short term and minor due to high water exchange/flow rates.

Summary:
The continuation of the no-action alternative has the potential to negatively but only temporarily, affect the recreational experience in the region in terms of aquatic and terrestrial recreational values of parks and facilities as well as for natural resource values. Overall, the Corps finds that this alternative would not significantly affect recreational resources.

Integrated Pest Management Alternative

Terrestrial Recreation:
As effective integrated weed management increases and maintains plant diversity, the aesthetic quality of the recreational areas would improve over the long-term. Further, improved habitat quality from reduction of noxious plants would enhance wildlife-related recreational opportunities, such as bird watching. No significant difference is expected in pest insect and waterfowl encounters from that of the no-action alternative.

The presence of personnel and machinery performing pest management activities could detract from the recreational experience through temporary visual and auditory intrusions as with the no-action alternative. Likewise, the chemical application methods would require temporary exclusion of recreational users from certain areas.

Aquatic Recreation:
The proposed action would affect aquatic recreation similarly to the no action alternative, but could allow for less intrusive pest management actions over time that could result in an improved recreational experience.

Summary:
Employing IPM would ultimately reduce the amount of chemical applications and would also decrease the terrestrial pest management disruptions to recreation due to closures. The integration of other pest management methods could also prove to be less obtrusive – e.g. mulching and hand pulling. Therefore, the Corps finds that this alternative would not significantly affect recreational resources.

Habitats and Species

Affected Environment

This section focuses on natural vegetative community types and the associated wildlife found within the project area, including protected and sensitive plant and animal species.

Terrestrial Habitats
The vegetative communities include natural upland and wetland (aquatic) habitats (Table 3-2). (See Appendix D for greater detail on identified terrestrial habitats.) Upland habitats are divided into four general management categories in the District: wildlife habitat lands, park lands, project operations lands (usually associated with facilities, such as storage areas, road shoulders, utility yards, parking lots, and switchyards), and forested lands at Dworshak Project in Idaho. Within the project area, invasive plants have outcompeted native plants in many areas and would continue to do so without effective management. Invasive species can reduce native plant communities and threaten biodiversity (WADAE, 2004).

Table 3-2. Terrestrial Vegetative Communities on District Corps' Lands.

Vegetative Community	Acres
Disturbed or modified land	15,883
Sand	506
Cliff, canyon and talus	453
Forested habitat	23,979
Semi-arid, shrub-steppe habitat	20,451
Grassland habitat	13,716
TOTAL	**74,988**

Terrestrial Species

Table 3-3 lists the federally protected terrestrial species potentially found within Corps land that may be affected by the proposed actions. Detailed information regarding each species can be found within the Biological Assessment (BA) the Corps completed for the proposed actions (USACE, 2012).

Table 3-3. Federally Listed or Candidate Terrestrial Species which Could Occur within the Proposed Management Areas

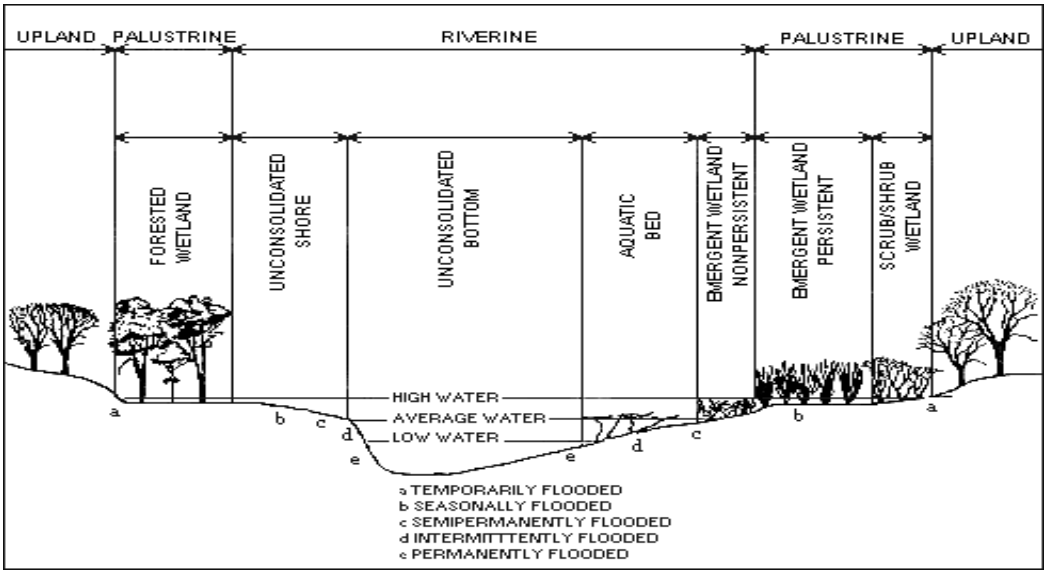
Common Name	Scientific Name	Status
Mammals		
pygmy rabbit	*Brachilagus idahoensis*	Endangered
Canada lynx	*Lynx canadensis*	Threatened
gray wolf	*Canis lupus*	Recovered
Washington ground squirrel	*Urocitellus washingtoni*	Candidate
North American wolverine	*Gulo gulo luscus*	Candidate
Birds		
greater sage grouse	*Centrocercus urophasiunus*	Candidate
Plants		
Spalding's catchfly	*Silene spaldingii*	Threatened
Umtanum desert buckwheat	*Eriogonum codium*	Proposed Threatened
White Bluffs bladderpod	*Physaria tuplashensis*	Proposed Threatened
slickspot peppergrass	*Lepidium papilliferum*	Threatened

Sources: USACE, 2012; USFWS, 2012

Aquatic Habitats

Aquatic habitats (or wetlands) are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. Riverine wetlands are freshwater rivers and their tributaries along with most associated wetlands (Figure 3-1). This includes both naturally occurring riparian vegetation and artificial riparian vegetation planted as part of the Corps mitigation efforts. For the purposes of this EA, wetlands must have one or more of the following three attributes: (1) at least periodically, the land must support predominantly hydrophytes (wetland plants); (2) the substrate is predominantly undrained hydric soil (i.e. adapted to a wet environment); and (3) rocky, gravelly, or sandy areas that are saturated with or covered by shallow water at some time during the growing season (Cowardin, 1979). Wetland subtypes in the District include freshwater emergent wetlands, freshwater forested/shrub wetlands, freshwater ponds, lakes and riverine wetlands.

Figure 3-1. Riverine wetland complex (Cowardin, 1979).



Wetland areas comprise approximately 45,000 acres (Table 3-4), or 28 percent of the land and water managed by the District. Lakes make up the largest wetland component, with over 41,000 acres.

Table 3-4. Wetlands in the District

Freshwater Wetland Type	Acres
Emergent wetland	809
Forested/shrub wetland	935
Pond	126
Lake (*includes run of the river reservoirs*)	41,082
Other	5
Riverine	141
Riparian habitat	**2,195**
TOTALS	**45,293**

Sources: USFWS, 2009 and USGS, 2011

Data from the National Wetlands Inventory (NWI) (USFWS, 2009) and Gap Analysis Program (USGS, 2011) were consulted and used to identify where wetland areas occur in the District. The wetland classification system used by the NWI and in Table 3-4 was developed in Cowardin (1979).

Acquatic Species

Table 3-5 lists the federally protected aquatic species found within Corps management jurisdiction which may be affected by the proposed actions. Detailed information regarding each species can be found within the BA the Corps completed for the proposed actions (USACE, 2012).

Table 3-5. Federally Listed or Candidate Aquatic Species which Could Occur within the Proposed Management Areas

Common Name	Scientific Name	Status[1]
Fish		
UCR chinook salmon	*Oncorhynchus tshawytcha*	Endangered
SR spring/summer chinook salmon	*Oncorhynchus tshawytcha*	Threatened
SR fall chinook salmon	*Oncorhynchus tshawytcha*	Threatened
SR sockeye salmon	*Oncorhynchus nerka*	Threatened
MCR steelhead	*Oncorhynchus mykiss*	Threatened
UCR steelhead	*Oncorhynchus mykiss*	Threatened
SRB steelhead	*Oncorhynchus mykiss*	Threatened
bull trout	*Salvelinus confluentus*	Threatened
Birds		
yellow-billed cuckoo	*Coccyzus americanus*	Candidate
Invertebrates		
Snake River physa snail	*Haitia {Physa} natricinia*	Endangered
Bliss Rapids snail	*Talorconcha serpenticola*	Threatened

Plants		
Ute ladies' tresses	*Spiranthes diluvialis*	Threatened
slickspot peppergrass	*Lepidium papilliferum*	Threatened

MCR = Middle Columbia River; SR = Snake River SRB = Snake River Basin; UCR = Upper Columbia River
Sources: USACE, 2012; USFWS, 2012

Environmental Consequences
No Action Alternative

Under this alternative, the Corps would continue to implement its current pest management program. An informal reconnaissance during annual implementation of pest management activities directs pest management activities for the next year under the no-action alternative. This alternative emphasizes the use of chemicals for weed management with a wide range of herbicides applied primarily to habitat management units and parks. This alternative informally addresses pest arthropod, rodent and waterfowl issues on an as-needed basis.

Terrestrial Habitats:

- *Terrestrial Vegetation*
    - *Chemical Weed Treatment Methods:*

The alternative typically consists of up to twice annual treatments (infrequent). Potential direct impacts to native or non-target (desirable) vegetative communities include mortality, reduced productivity, and abnormal growth. These impacts depend on the sensitivity of the plant species to the specific herbicide and the dose to which the plant was subjected. Potentially adverse impacts from occasional herbicide application to forested, semi-arid and shrub/steppe, grassland, or other habitats found within the project area would be similar to those in habitat management units. Chemical pest control methods under the no action alternative have the potential to adversely affect ESA-listed terrestrial plant species if present (Ute ladies'-tresses, White Bluffs bladderpod, Spalding's catchfly, or Umtanum desert buckwheat).

    - *Mechanical and Biological Methods:*

Mechanical methods (including manual treatments such as hand pulling) under the no action alternative have the potential to negatively affect ESA-listed plant species. This is particularly the case for activities such as mowing that while it does have a higher chance of reducing the vigor of noxious weeds, it also is less precise in selecting what is and what isn't cut. Overall, it is anticipated native vegetation would recover after manual/mechanical treatments and the overall integrity of the vegetative communities would remain the same.

Biological treatments are very specific and would not be expected to affect ESA species. They are rarely applied in the District under the no action alternative. Biological controls used in the United States undergo rigorous testing and are designed to ensure that introduced agents are limited in range and do not threaten native, nursery, or crop plants. Therefore, biological control treatments are anticipated to be very selective and to have negligible short-term impacts on all of the vegetation communities found within the project area.

Under the no action alternative, the District has not actively pursued the use of proven ecologically sensitive methods such as controlled grazing as part of its weed control efforts.

It should be noted that removing vegetation under any of the identified management tools could increase the chance of surface water runoff and erosion. When soil is exposed, sediment may be transported off site, destabilizing adjacent plant community root structures and creating areas vulnerable to new weed infestations. The no action alternative fails to address planning to avoid or to stabilize exposed soil situations.

Terrestrial Wildlife

- *Chemical Methods:*

Chemical pest control methods under the no action alternative have the potential to adversely affect ESA-listed and candidate terrestrial species (i.e. Washington ground squirrel, pygmy rabbit, yellow-billed cuckoo and greater sage grouse), critical habitat and other non-target species. The continuation of the current pest management regime could result in adverse impacts due to continued pesticide exposure to wildlife. Organophosphate and carbamate insecticides (e.g. parathion and diazinon) have been shown to impact bird species by causing respiratory failure and death (USFWS, 2000). The use of rodenticides could have negative impacts on aquatic mammals as they have been used near wetland resources, specifically targeting aquatic mammal pests. For those species directly targeted by pest management efforts, there are no anticipated new impacts to their populations – e.g. egg addling for designated waterfowl such as Canda geese. In some areas, pest management would target individuals to maintain populations within acceptable levels but as these are common nuisance species, the loss of individuals would not be expected to impact the species as a whole.

Overall impacts to wildlife from pesticide applications are anticipated to be both direct and indirect. Some species would encounter beneficial impacts through improved habitat while other species would experience adverse impacts through direct or indirect exposure to pesticides. Under the no action alternative, pest management activities woud not recognize necessary changes in pesticide use driven by ongoing litigation or new scientific information on the effects of pesticide use on ESA-listed fish species.

- *Mechanical and Biological Methods:*

Mechanical and biological methods would have a direct impact on target pest species with an indirect impact on other species that interact with those species, such as predators. Mechanical pest control methods under the no action alternative have the potential to adversely affect ESA-listed and candidate terrestrial species (Washington ground squirrel, pygmy rabbit, yellow-billed cuckoo and greater sage grouse) and other non-target species, but biological controls would not due to their target specificity.

Aquatic Habitats:

- *Aquatic Vegetation:*

Weeds that invade wetlands (e.g. phragmites, purple loosestrife, flowering rush, Russian olive) are known or are likely to have detrimental and long-lasting impacts on wetland ecosystems.

Weeds crowd out native plants and animals, interfere with or alter natural processes such as water flow and evapotranspiration and lead to loss of native plant biomass and biodiversity.

Weed management in aquatic/wetland habitats would result in the reduction of or prevention of expanding infestations and ultimately enhance native wetland plant communities. Enhancing native wetland vegetation would eventually provide higher quality habitat for wildlife and aquatic species and improve wetland function.

- *Chemical Methods:*

Some aquatic herbicides are non-selective and could cause adverse impacts to non-target wetland species diversity, competitive interactions, species dominance and vegetation distribution. Herbicide applications could reduce total plant cover, leading to increased sedimentation, increased nutrient loading, alterations in native vegetation, and changes to temperature and hydrologic conditions. Accidental applications (overspray) can have severe negative impacts on wetland and riparian systems. Spray drift can also degrade water quality in wetland and riparian areas and could damage non-target vegetation. Misapplications and spills are the leading cause of impacts on non-target vegetation and could also impact other non-target species.

Direct application of chemicals to wetlands performed under the no action alternative would be environmentally unacceptable as the effects of such applications have not been fully consulted upon under ESA. The no action alternative could effectively control wetland weed infestations and could benefit wetlands and ecosystem integrity. The minor to moderate, short-term (up to long-term) adverse impacts from herbicide use could help offset the moderate, long-term impacts of pest infestations and support the reestablishment of native plant species and communities. As most pesticide effects would be minor and short-term, the benefits of avoiding the moderate long-term pest impacts results in a net benefit.

- *Mechanical and Biological Methods:*

Manual/mechanical control of weeds would have negligible or no adverse impacts on wetlands in the short-term and minor to moderate beneficial impacts in the long-term. Application of manual/mechanical weed control methods could increase potential for erosion and sedimentation into wetlands. However, only small infestations would normally be treated with manual/mechanical controls, thereby reducing the potential for erosion. Biological weed control would also not be expected to have any negative impacts on wetlands. Reduction of weeds via manual/mechanical control and biological control would have minor to moderate, long-term benefits on wetlands as it is anticipated native wetland species would become reestablished in treated areas.

- *Aquatic Wildlife*
  - *Chemical Methods:*

Chemical toxicity from pesticide applications can directly impact aquatic wildlife and habitats. Chemical pest control methods under the no action alternative have the potential to adversely affect the ESA-listed species and critical habitats as well as other non-target species. There could be impacts to aquatic wildlife from chemical control of arthropods as applications would not be limited. Some species that are not the target of pest management efforts may be affected by the no action alternative. Aquatic species may encounter pesticides through runoff and any

species that consumes insects may accumulate pesticides through its diet. Pesticides can also kill salmonid species directly or through continued exposure (OPEN, 1999). Pest management under the no action alternative does not recognize necessary changes in pesticide use driven by ongoing litigation or new scientific information on the effects of pesticide use on ESA-listed fish species.

- *Mechanical and Biological Methods:*

Mechanical (e.g. traps and rifles) and biological methods of pest management would have a direct impact on target pest species (e.g. beaver and muskrat) with an indirect impact on other species that interact with those species, such as predators. Mechanical and biological pest management methods under the no action alternative have the potential to adversely affect ESA-listed aquatic species through disturbance, turbidity, water temperature impacts, food resource impacts as there are no limits imposed on treatments. However, biological controls would not have these negative effects.

Manual/mechanical vertebrate and invertebrate controls could impact aquatic wildlife by temporarily altering predator/prey balances. Some small, limited mobility aquatic wildlife species could be directly impacted by weed control methods, particularly as some of the no action alternative chemicals are toxic to non-target species.

Integrated Pest Management (Preferred) Alternative

As described in Chapters 1 and 2, this alternative involves developing and implementing an IPMP intended to provide strategies to manage vegetation, vertebrate, and arthropod pests through a more balanced application of manual/mechanical, biological, and chemical controls. This alternative employs integrated methods which can be used to establish pest management priorities and allocate resources to key pest issues.

The IPMP would employ long-term data collection, adaptive management and comprehensive District-wide decision making based on the best available science in the spirit of the Corps' Environmental Operating Principles. An IPMP would also identify the method or methods most effective and environmentally acceptable to the pest infestation situation. Treatment could occur anywhere on District lands where pest issues occur and would be based on planned treatment priorities. The annual scale of treatment would be approximately the same as under the no action alternative.

Terrestrial Habitats:

- *Terrestrial Vegetation*
    - *Chemical Methods:*

Chemical treatment methods under the preferred alternative would be similar in scope but the chemicals employed would be different than under the no action alternative. There would be fewer chemicals employed, and they would have known environmental effects, particularly with regard to ESA-listed species impacts. Only herbicides and surfactants that have had ESA consultation completed as described in the District pest management program BA (or subsequent supplements) would be employed under this alternative. The preferred alternative would employ

a number of best management practices (BMP) identified in Chapter 2, which would minimize non-target vegetation impacts.

Under this alternative native vegetation exposure to pesticides would be limited, as opposed to the no action alternative. Appendix C lists the pesticides proposed for use under the preferred alternative as well as the proposed adjuvants (i.e. substance added to aid the effect of the main ingredient) for District lands. Other pesticides with known environmental effects could be added to this list as further consultations under ESA are completed. This alternative would also follow pesticide labels describing application methods. As with the no action alternative, each person participating in herbicide applications or administrating pest control contracts in the District would be trained and certified in the state in which the work is performed (USACE, 2012) as appropriate to the treatment situation. Herbicide treatments under this alternative are anticipated to have effects similar to but lesser than those identified under the no action alternative, as fewer and less intensive chemical applications are the anticipated long-term results due to integration with other pest management methods.

- *Mechanical and Biological Methods:*

Under this alternative mechanical (including manual) weed management methods would be similar to the no action alternative with the addition of such methods as mulching (placing mulch materials around desirable plants to reduce or prevent the establishment of weeds or other competitive plants). The impacts of mechanical weed management would be minor and short-term. Native and other desirable vegetative community structure, composition, ecological processes and integrity would remain intact and would be expected to improve in quality when integrated with other methodologies, such as pesticide applications.

Biological weed management methods and impacts would be similar to the no action alternative, with the exception of controlled grazing. Target grazing under an IPMP would require controls (e.g. timing or herding) that would prevent or reduce damage to desirable vegetation communities. Grazing can be effective at controlling many weed species throughout the growing season, particularly when combined with limited chemical applications.

Burning, either selectively by hand burners or by controlled burns affecting many acres, could be employed along with mechanical, biological and chemical methods. Propane weed burners would be employed only to address small, isolated areas where the risk to wildfire is not great. Effects of targeted weed burning to non-target species would typically be similar to but less than with broadcast spraying of herbicides, as selectivity is greater. However, targeted weed burning effects would be more than spot treatments as weed burners are not as precise as most sprayers, nor are controlled burns.

While it is anticipated that mechanical, biological and burn treatments would result in minor, short-term adverse impacts, it is also anticipated that desirable vegetation would recover. However, removing vegetation under any of these management tools could increase the chance of surface water runoff and erosion, similar to the no action alternative. This alternative also addresses proper planning and alternative methods that could avoid or reduce exposed soil situations.

The long-term benefits to desirable plant community ecological functions should be greater over time and would be consistent with Corps policy and in compliance with federal laws. Further, the proposed action would utilize new scientific information on the effects of pesticide use on plant species listed under the ESA and on sensitive plant communities, and would develop a program meeting the spirit of the Corps' Environmental Operating Principles.

- *Terrestrial Wildlife*

The wildlife species found within Corps lands are interrelated with the existing habitat and vegetation. These communities provide habitat for a variety of wildlife including mammals such as ungulates like mule deer and Rocky Mountain elk; omnivores like black bear, coyotes, and raccoons; and predators such as mountain lions (NatureServe, 2012). Many cavity-nesting bird species such as bluebirds, chickadees, and woodpeckers use snags in forest habitats. The Columbia, Snake, Clearwater and Walla Walla River systems support numerous species of terrestrial reptiles, amphibians and birds that could be impacted by the preferred alternative. NatureServe (2012) estimates that the project area ecoregion supports about 59 mammal species, 12 reptile or amphibian species, 120 bird species, and over 133 insect species.

- *Chemical Methods:*

Impacts to terrestrial wildlife due to chemical applications are expected to be less than the impacts described under the no action alternative. The lesser degree of impacts is due in large part to conservation measures and subsequent BMPs which would be utilized under the preferred alternative. Wildlife should also benefit from the long-term benefits of planning and prioritizing pest management strategies. Ultimately, reducing the volume of chemical treatments reduces the potential for toxicity. Application measures such as drift-reduction measures, and buffers and wind speeds also reduce the potential for exposure. The beneficial effects and reduced adverse impacts apply to ESA-listed and general wildlife species. A complete list of the best management practices and conservation practices by which the proposed action would be governed is provided in Appendix B.

From time to time, waterfowl, including Canada geese and feral (human raised and released) ducks and geese pose health and safety hazards in park and recreation areas used heavily by the public. Rather than euthanizing these birds, which can be costly and time consuming, and can create public relations problems, the eggs of nesting birds would be brushed with a food grade vegetable oil such as corn oil or canola oil, which seals the pores in the eggs, causing the embryo to die. Over a period of a few years, the numbers can be reduced substantially. This technique would be used only in park and recreations areas and would be used on species such as Canada geese only after discussions with the appropriate state fish and wildlife agency and the USFWS.

- *Mechanical and Biological Methods:*

Impacts to terrestrial wildlife due to mechanical and biological applications are expected to be potentially greater in the short-term than the no action alternative as use of these methods could increase as a change from chemical-focused management happens. However, over the long-term, the IPM alternative would be expected to have fewer and less impacts than those described under the no action alternative as more effective long-term pest management strategies are employed and less intensive pest management methods can maintain low levels of pest infestation. Impacts and impact reductions to terrestrial ESA-listed species and other sensitive terrestrial wildlife

species would be similar. Impacts to Washington ground squirrel would be decidedly less due to the survey requirements under the IPM alternative.

Aquatic Habitats:

- *Aquatic Vegetation*
    - *Chemical Methods:*

Under the preferred alternative the Corps would only employ chemical formulations which have been properly analyzed and consulted upon to determine effects to ESA-listed species for treatments directly to or over water. To date the District has not completed any ESA consultations on aquatic pesticide applications. As such consultations are completed, aquatic approved chemicals could be employed under the IPMP. Impacts on wetlands from chemical use would, however, be similar to but reduced in comparison to the no action alternative. Several chemicals have been consulted on to date for applications up to the water's edge, and thus would be applied within wetlands as defined by Cowardin (1979).

Herbicide impacts to aquatic habitats under the IPM alternative would be similar but reduced when compared to the no action alternative. The short-term adverse impacts of treating wetland pests with herbicides would be reduced under the IPM alternative compared to the no action alternative with the implementation of BMPs as described in Chapter 2. When aquatic pesticides have been consulted upon, they could be employed over or proximate to open water habitats. BMPs also reduce the potential for wetland/aquatic impacts from aerial spraying by the establishment of 300 foot buffer areas around surface waters. Also, aerial spray of pesticides would not be conducted when wind speeds are greater than 5 or less than 2 miles per hour.

The IPM alternative would result in effective control of weed infestations and would be expected to benefit wetland ecosystem integrity, particularly when integrated with other pest management methods, such as controlled grazing. Although herbicides would be used to manage weed infestations, it is unlikely that herbicides applied under the IPM alternative would measurably degrade desirable wetland vegetative communities. Chemical treatment of arthropods or vertebrates would not impact aquatic vegetation resources under the preferred alternative.

    - *Mechanical/Manual and Biological Methods:*

Impacts from manual/mechanical weed control and biological control would also be similar to impacts under the no action alternative. Manual/mechanical and biological control of weeds would have negligible or no adverse impacts on wetlands in the short term and minor to moderate beneficial impacts in the long term.

Impacts of mechanical/manual and chemical control of vertebrates and arthropods would be similar to those under the no action alternative. Mechanical or biological control of vertebrates and arthropods would have no effect on wetlands.

- *Aquatic Wildlife*
    - *Chemical Methods:*

Under the IPM alternative the Corps would be able to lessen the impacts to aquatic wildlife , to include ESA-listed species, described under the no action alternative while maintaining effective pest management. The lesser degree of impacts is due to conservation measures and stricter rules in regard to chemical use. As with terrestrial wildlife, reducing the amount of chemicals reduces the potential for toxicity, and the application measures such as drift-reduction measures, buffers and wind speeds also reduce the potential for exposure. A complete list of the BMPs by which the preferred alternative would be governed is provided in Appendix B. This alternative provides the Corps with an adaptive management strategy that would have a greater chance of removing noxious and non-nuisance vegetation and keeping it off of the project area, which would be beneficial to native and non-nuisance vegetation species and thus indirectly benefit wildlife species.

In the 2012 BA, the Corps determined that the proposed action may affect, is not likely to adversely affect ESA-Listed fish species, and may affect, is not likely to adversely affect designated critical habitat for the designated species. These findings are the result of analysis of the impacts of the proposed action in terms of disturbance, chemical toxicity, chemical contamination, and food resources. Exposure to potential stressors would be reduced by the implementation of proposed conservation measures, specifically drift-reduction measures and buffers and wind speed restrictions identified in the BA. This will be particularly effective in reducing the concentration of chemicals that could potentially cause a response in listed species (specifically fish), thus reducing the toxicity.

The proposed action is likely to have a benefit to all aquatic species by restoring native vegetation and thereby restoring ecosystem and riparian function. In terms of ESA-listed salmon and steelhead, the restoration of riparian habitat would benefit juveniles by improving shallow water, migration, and rearing habitat. Adult bull trout may benefit from restored riparian habitats through increased prey species that would colonize the improved ecosystem. Consequently, most potential adverse impacts are expected to be direct and short-term and offset by benefits to riparian function, and thus may improve the long-term viability of listed species. The Corps has also outlined conservation measures directly related to federally protected species.

Canada goose, feral goose and duck egg addling effects would be similar to the no action alternative. Aquatic mammal effects would also be similar to those described under the no action alternative, but could be reduced if effective alternative means of management are developed.

- *Manual/Mechanical and Biological Methods:*

Under the IPM alternative employing manual and mechanical methods would have similar effects to aquatic species as those described under the no action alternative.

Water Quality

Affected Environment

There are 861 total miles of rivers, ponds and ditches in the District, the primary management concern of which is the larger rivers and associated lakes/reservoirs (Table 3-6).

Table 3-6. Impounded or Dammed Water Bodies in the Walla Walla District

Project	Lake	Reservoir Length (miles of river)	Surface Acres (min-max)
McNary Dam	Columbia River, Lake Wallula	61.6	37000
Ice Harbor Dam	Snake River, Lake Sacajawea	31.9	8375
Lower Monumental Dam	Snake River, Lake Herbert G. West	28.7	6590
Little Goose	Snake River, Lake Bryan	37.2	10025
Lower Granite	Snake River, Lower Granite Lake	39.3 (Snake); 4.6 (Clearwater)	8900
Mill Creek	Mill Creek, Bennington Lake	1	64 (Bennington Lake and Mill Creek)
Dworshak	Clearwater River, Dworshak Reservoir	53.6	9050-17090
Lucky Peak	Boise River, Lucky Peak Lake	12 (Boise); 5.5 (Mores Creek)	820-3019

The lower Snake River has been designated by the States of Washington and Idaho for uses that include salmon spawning, rearing, and migration; primary contact recreation; domestic, industrial, and agricultural water supply; stock watering; wildlife habitat; commerce and navigation; boating; and aesthetic values. Segments of the river on the Washington side have been listed by the Department of Ecology (WDOE) under category 5 of Section 303(d) of the Clean Water Act for dissolved oxygen, temperature, and pH. The Idaho Department of Environmental Quality has similarly listed the river on its side of the border for temperature. (Juul personal communication, 2013).

The Columbia River is monitored annually for a variety of chemical contaminants (WDOE, No Date). Columbia River water is collected from multiple Hanford Reach sampling points throughout the year. The Columbia River from McNary Dam upstream to Grand Coulee Dam is on the 303(d) list for water temperature (Juul personal communication, 2013).

Dworshak Reservoir was created by construction of Dworshak Dam on the North Fork Clearwater River. The reservoir is not on the State of Idaho's 2010 303(d) list of impaired waters (IDEQ, 2011) and is considered a high quality waterbody. However, the two-mile reach of the river below the dam is listed under category 5 based on dissolved gas supersaturation. Similarly, the reach of the Clearwater River that flows into Lower Granite pool, as well as the upper reach of the reservoir in Idaho, are also listed for total dissolved gas.

Lucky Peak Reservoir water quality was monitored by the Corps 1996, 1997 and 1998. Measurements of DO, pH, and turbidity showed no exceedances of water quality standards (IDEQ, 2009). Further water quality monitoring by the Corps identified *E. coli* bacteria levels at the Robie Creek Beach access in excess of state water quality standards in 2006, 2007, 2008 and 2012. Other samples collected indicate that *E. coli* bacteria are likely a localized problem at the Robie Creek site. Lucky Peak Reservoir is not on the Clean Water Act §303(d) list of impaired waters (IDEQ, 2009).

Environmental Consequences

No Action Alternative

Pesticide applications have an inherent potential to affect water quality when in contact with the water table or surface water. Under the no action alternative, the Corps would continue their current program to manage a number of weed species and several arthropod and vertebrate pests using primarily chemical treatments, with some limited biological, manual and mechanical methods.

Chemical Methods:

Terrestrial weed treatment under the no action alternative follow EPA label restrictions and therefore are assumed to be less than significant; however, many of these pesticide applications have not been evaluated under the ESA for effects to sensitive fish species. This alternative does not employ buffers or other added measures to reduce or avoid impacts to water quality. The no action alternative includes pesticides that are highly persistent and therefore have a high chance of entering water bodies through runoff and/or leaching. (The no action alternative would include treatment of over adsorptive soils with soluble chemicals, which would have the highest potential to affect water quality.)

Impacts to water quality would be adverse and minor to moderate in the short-term due to potential water quality degradation from the use of herbicides to control invasive species. Additionally, there would be beneficial, moderate impacts over the long-term as herbicides would control invasive plants and native species would reestablish. Conservation measures employed to protect water resources would reduce the potential adverse impacts of herbicide use.

Mechanical/Manual and Biological Methods

Manual/mechanical control of weeds would have negligible or no adverse impacts on water quality in the short term and minor to moderate beneficial impacts in the long term. Application of manual/mechanical weed control methods could increase potential for erosion and sedimentation into surface waters. However, generally large infestations would be treated with herbicides, while small infestation would be treated with manual/mechanical control, thus reducing the potential for erosion. Impacts on water quality due to erosion from manual/mechanical treatments would be negligible.

Biological weed control would not be expected to have any negative impacts on wetlands. Reduction of weeds via manual/mechanical control and biological control would have minor to moderate, long-term benefits on water quality as native species would be expected to reestablish in treated areas and habitat for wildlife and aquatic species would improve.

IPM Alternative

The preferred alternative is similar to the no action alternative and would manage nuisance and noxious weed species and several arthropod and vertebrate species using manual/mechanical control, chemical control, and biological control. However, it would also employ BMPs and careful planning. Under the IPM alternative, the Corps would treat approximately the same acreages as under the no action alternative, but acreages may vary more from year to year to meet specific needs. Differences in chemical use include fewer chemicals approved for use, more careful consideration of impact-minimizing application methods, and adherence to restrictions on wind speed and proximity to water.

Chemical Methods

Although chemical use under the IPM alternative would be different than under the no action alternative regarding application methods, type and number of chemicals, and proximity to water, the types of impacts on water quality from chemical use would be similar under the two alternatives.

Under the IPM alternative, the Corps would use only four herbicides approved for aquatic habitats: 2,4-D, glyphosate, imazapyr, and triclopyr. The remaining herbicides available to the Corps are registered for use on terrestrial sites. There would be low risk to drinking water in areas treated with glyphosate or imazapyr, even if these herbicides were accidentally spilled in streams, ponds, or lakes used by humans. However, risk to drinking water associated with 2,4-D or triclopyr applications could be moderate to high if in an area of low flow exchange.

The short-term adverse impacts of treating invasive weeds with herbicides would be further reduced compared to the impacts of the no action alternative with additional mitigation measures. By following label instructions and restrictions, and establishing buffers, applicators can reduce the potential for herbicides to reach water bodies. Additional BMPs would also help to reduce impacts.

Potential impacts to water quality are anticipated to occur in the immediate vicinity of pest management activities or immediately downstream of those activities. Water quality impacts would be adverse and minor in the short term from use of herbicides. Proposed conservation measures would minimize the extent of potential adverse impacts to water quality, and the observance of these proposed conservation measures, along with the high volume exchange rate in the water systems in the action area, would further reduce the potential short-term impacts via dilution and dissipation.

Mechanical/Manual and Biological Methods

Impacts from manual/mechanical weed control and biological control would also be similar to impacts under the no action alternative. Manual/mechanical and biological control of weeds would have negligible or no adverse impacts on water quality in the short-term and minor to moderate beneficial impacts in the long term.

Impacts of manual/mechanical and chemical control of vertebrates and arthropods would be similar to those described under the no action alternative. Control of vertebrates and arthropods would have no effect on water quality.

CUMULATIVE IMPACTS

The CEQ regulations (40 CFR 1508.7) require the assessment of cumulative impacts in the decision-making process for Federal projects. A cumulative effect is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (Federal or non-Federal), organization, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

To determine potential cumulative impacts, projects in the vicinity of the proposed project site were identified. Potential projects identified as contributing to cumulative actions included any planning or development activity that was currently being implemented or that would be implemented in the reasonably foreseeable future.

Cumulative Impacts Area

The cumulative impacts area for this project is all Corps owned lands and the surrounding watershed. Relevant actions are those that are implemented by the Corps and others in the region.

Consideration of Past Projects

The CEQ guidance on consideration of past actions in cumulative impacts analysis notes that "agencies are not required to list or analyze the impacts of individual past actions unless such information is necessary to describe the cumulative effect of all past actions." (CEQ, 2005) In order to understand the contribution of past actions to the cumulative impacts of the alternatives, this analysis relies on current resource settings and conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all past and present human actions and natural events that are difficult to quantify but that have affected the environment and might contribute to cumulative impacts. Existing conditions are a result of past and present impacts to the various resources. These existing conditions are described in this chapter under the Affected Environment Section for each identified environmental resource/component.

Consideration of Present and Future Actions

Other present and reasonably foreseeable actions that are considered in this analysis of cumulative impacts are those actions that are occurring or are proposed within the cumulative impacts area. These actions include the following:

Federal Actions

Corps of Engineers

- Conversion of Central Ferry State Park to a wildlife habitat area: change in management would likely lead to decrease in chemical use to control certain pests and more native vegetation could be planted which may deter some pest species from becoming established.
- Lower Snake River Planting Program and Comprehensive Plan: This program includes replacing/developing wildlife habitat by planting vegetation. Although this program is not new, the goal is to shift from high investment plantings (planting vegetation with accompanying designs that require long-term irrigation and/or care) to planting native vegetation that is more likely to succeed with minimal care (irrigation). Native vegetation that can outcompete pest species would be considered by this plan.
- Dworshak Forest Health Project: Although geared toward forest health in general, maintaining a healthy forest would help reduce the presence of pests and help deter establishment of pests.
- Confluence Project "Listening Circle" Lease, Chief Timothy Park: The District proposes to issue a park and recreation non-standard lease for up to 25 years to the Confluence Project for installation of an artwork project on Silcott Island within Chief Timothy Park.
- Inland Avian Predation Project : The District is currently leading an effort to develop an Inland Avian Predation Management Plan for managing bird pests (avian predators) that prey on ESA-listed fish species in the Columbia and Snake Rivers.
- Lower Boise River Feasibility Study: The District and the Idaho Water Resource Board are partnering on a feasibility study of the lower Boise River and tributaries from Lucky Peak Dam downstream to the confluence with the Snake River. The study will consider environmental restoration, to include habitat preservation, aesthetics and recreation along the Boise River.
- 2012 McNary Shoreline Management Plan: Most of the shoreline on the reservoir behind McNary Dam is federally managed. The shoreline plan addresses policies and procedures, shoreline allocations and requirements for permitting private use of public lands managed by the District, including criteria for design and construction of private docks and vegetation modification.

Bureau of Land Management

The U.S. Department of Interior and Bureau of Land Management have been directed to take more aggressive actions to reduce catastrophic wildfire risk on public lands in response to the threats of wildfire and invasive vegetation and noxious weeds (BLM 2007). This approach is being implemented through the *National Fire Plan*, and the *Healthy Forests Restoration Act of 2003*. Actions would be taken to protect life and property, while managing vegetation in a sustainable manner, with improved habitat and vegetation conditions for fish and wildlife, and other public land uses (BLM 2007).

Environmental Protection Agency

The Environmental Protection Agency (EPA) has begun consultation with NMFS' Office of Protected Resources for re-registering 37 pesticide active ingredients. Court orders preceding these consultations have altered the way certain pesticides are applied in the region through area-specific buffer restrictions for those pesticides applied proximate to water containing ESA-listed

Pacific salmonids. As part of a court settlement with the plaintiff, NMFS agreed to complete biological opinions for the 37 active ingredients, with final deadlines specified for different batches of pesticides. NMFS has completed five opinions addressing 27 active ingredients (NMFS 2012).

Regional Agriculture

The U.S. Department of Agriculture's (USDS) National Agricultural Statistics Service (NASS) provides statistics regarding pesticide use. The 2007 NASS report (Table 3-7) lists acreages of pesticide use in Idaho, Oregon, and Washington for 2002 and 2007 (USDA 2007). When compared to the regional agricultural efforts, the District pest management footprint (approximately 8,000 acres annually through 2012) and effect is very small and contributes only minimally to additive pesticide effects.

Table 3-7. Northwest Pesticide Use in 2007

Chemicals used to control:		Year	Acres		
			Idaho	Oregon	Washington
Insects	Farms	2007	3,281	5,607	6,456
		2002	3,333	6,004	8,017
	Acres Treated	2007	1,063,684	704,040	1,286,462
		2002	989,857	585,754	1,076,928
Weeds, Grass, or Brush	Farms	2007	9,538	13,386	12,114
		2002	9,078	15,018	13,084
	Acres Treated	2007	2,654,205	2,222,673	3,816,454
		2002	2,539,472	2,181,158	3,602,017
Nematodes	Farms	2007	422	565	655
		2002	577	762	874
	Acres Treated	2007	188,043	68,835	142,248
		2002	243,399	71,185	155,841
Diseases in Crops and Orchards	Farms	2007	844	3,648	3,403
		2002	978	4,017	4,902
	Acres Treated	2007	359,825	463,280	543,911
		2002	387,232	431,907	594,650

Discussion of cumulative impacts

The present and future Corps actions discussed above typically involve such activities as habitat management, vegetation control, civil construction, and avian predation. The habitat management, vegetation control, and avian predation actions would generally involve maintaining or improving the presence of desirable species of vegetation and wildlife within the District. Specifically, the Central Ferry State Park, Lower Snake River Planting Program, McNary Shoreline Management Plan, and Dworshak Forest Health projects would seek to establish native vegetation that would out-compete pest species. The Avian Predation Management Plan seeks to enhance the survival prospects for ESA-listed fish species. These efforts would result in minor to moderate long-term beneficial impacts.

Projects such as the Confluence Project "Listening Circle" Lease involve construction that would temporarily disturb vegetation through modification of ground surface areas. These construction

projects would have project requirements to restore vegetation at the completion of the project, most likely using native vegetation.

While pest management could result in short-term loss of some resources, including soil, vegetation, and wildlife, these losses would not be cumulatively significant as Corps' owned lands and proposed pest management activities are a very small part of the regional pest management efforts. Over the long term, loss of resource values would be slowed, and in many cases, would be reversed. Short-term losses in resource functions would be compensated for by long-term gains in ecosystem health, particularly within the vegetation community. Integrated pest management would restore ecosystem processes and slow or potentially reverse the loss of vegetative productivity. Improvement in vegetation community characteristics would benefit wildlife.

Fourteen environmental components/resources were identified as relevant to the current action but only five warranted further analysis and consideration – i.e. cultural resources, recreation, habitats and species, water quality and cumulative effects. The following paragraphs provide a brief cumulative effects assessment for each environmental component/resource carried forward for additional analysis.

- Cultural Resources: All identified present and future projects (including pest management) are subject to the Section 106 process which requires assessment and evaluation of each undertaking prior to the start of work. The intent of Section 106 is to ensure historic properties are identified, ensure appropriate parties are given the opportunity to comment on the undertaking before it begins and to avoid or minimize impacts to historic properties. The process would limit impacts to cultural resources at both an individual and cumulative level and therefore should result in no significant adverse cumulative impacts.

- Recreation: The proposed undertakings would have an impact on recreation – e.g. visual, auditory, specific activities. However, the impacts should be temporary, short-term and limited in scope. Many of the proposed actions are focused on improving/enhancing vegetation areas, fish and wildlife numbers as well as safety and overall visitor experience. If many of the proposed projects are even partially successful in accomplishing their designated goals, over time recreation should become an even more enjoyable and positive activity. The result could be positive cumulative effects.

- Habitats and Species: Many of the present/future identified projects are specifically focused on enhancing and/or protecting habitat areas and fish and wildlife species (particulary endangered species). The intent is to improve habitat quality and allow for healthy wildlife populations. The overall result could be positive cumulative effects.

- Water Quality: Potential impacts to water quality under the pest management action are anticipated to occur when treating invasive weeds with herbicides. Impacts would be short-term and adverse in the immediate vicinity of pest management activities or

immediately downstream of those activities. However, proposed conservation measures would minimize the extent of potential adverse impacts to water quality by following label instructions and restrictions, and establishing buffers. In addition, the high volume exchange rate in the water systems in the action areas, would further reduce the potential short-term impacts via dilution and dissipation. It is not anticipated that pest management impacts when added to those of other known and proposed undertakings would result in significant cumulative impacts to water quality in the project area.

- Cumulative Effects: Based on analysis/assessment of each individual environmental component/resource as well as the overall project itself along with taking into account other currently known and proposed undertakings within the project area, it is not anticipated that pest management activities would result in significant cumulative effects.

ENVIRONMENTAL REVIEW REQUIREMENTS

National Historic Preservation Act, as Amended

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to consider the potential effect of their undertakings on historic properties. The definition of "undertaking" includes agency decision-making actions, such as implementation of a District-wide Integrated Pest Management Program Environmental Program. The NHPA also requires agencies to consult Tribes in determining whether the undertaking has the potential to affect historic properties. The District initiated Tribal consultation in June of 2012 and has continued to coordinate with the Tribes on this undertaking. (Table 3-8 contains a summary of tribal consultation that occurred for this project.) No tribal issues or concerns have been raised to date over the proposed undertaking. Under Section 106, the District has also initiated coordination/consultation with area Tribes as well as with the Washington, Oregon and Idaho State Historic Preservation Offices (SHPOs). The District made a project determination of "No Adverse Effect" and is awaiting response from the Oregon SHPOs and Tribes. The Washington and Idaho SHPOs concurred with the District's determination. (Copies of the Washington, Oregon and Idaho concurrence letters are available upon request.)

Table 3-8. Summary of Tribal Consultation to Date

Type	Description	Sent From:	Sent To:	Date
Letter	Initiation of Consultation	USACE	CTUIR Les Mithorn (Chairman) Catherine Dickson (THPO) Teara Farrow (CR Manager) Eric Quempts (Natural Res.)	6/18/2012
			CCT Michael Finley (Chairman) Guy Moura (THPO) Arrow Coyote (CR Manager) Doug Seymour (Natural Res.)	
			Yakama Nation Harry Smiskin (Chairman) Kate Valdez (THPO) Johnson Meninick (CR Manager) Phil Rigdon (Natural Res.)	
			Nez Perce Silas C. Whitman (Chairman) Patrick Baird (THPO) Vera Sonneck (CR Manager)	
			Shoshone-Bannock Nathan Small (Chairman)	

			Carolyn Smith (CR Manager) Yvette Tuelle (Natural Res.) <u>Shoshone-Paiute</u> Terry Gibson (Chairman) Ted Howard (THPO) Heather Lawrence (Natural Res.) <u>Warm Springs</u> Stanley Buck Smith Jr. (Chairman) Sally Bird (THPO) Patti O'Toole (Natural Res.) <u>Wanapum</u> Rex Buck Sr. (Chairman) Angella Neller (CR Manager)	
Email	Follow up to initial consultation letter offering face-to-face meetings	USACE (Scott Hall)	Cultural resources technical staff for the CTUIR, CCT, Yakama, Nez Perce, Shoshone-Bannock, Shoshone-Paiute	8/9/2012
Email	Request for a face-to-face meeting	CTUIR (Teara Farrow)	USACE (Scott Hall)	8/9/2012
Email	Confirmation of meeting date and time	USACE (Scott Hall)	CTUIR (Teara Farrow)	8/24/2012
Phone Call	Follow up calls to the Tribes to discuss interest in the project and potentially schedule a face to face meetings	USACE (Scott Hall)	CCT (spoke with Guy Moura) Yakama (Message: Johnson Meninick) Shoshone-Bannock (Message: Yvette Tuell)	8/28/2012
Meeting	Face-to-face meeting at the CTUIR office in Mission, OR	N/A	<u>CTUIR:</u> Teara Farrow (CR Manager) Audie Huber (Intergovernmental Affairs Manager) <u>District:</u> Jason Achzinger (Biologist) Scott Hall (Archaeologist) Erin Hudson (Archaeologist)	9/4/2012
Meeting	Teleconference meeting with CCT	N/A	<u>CCT:</u> Janet Ebaugh (Plant	10/2/2012

			Ecologist) <u>District</u>: Alice Roberts (Supervisory Archaeologist Scott Hall (Archaeologist) Erin Hudson (Archaeologist)	

Clean Air Act, as Amended

Section 309 of the Act requires that an environmental assessment be provided to the Environmental Protection Agency (EPA) for review and comment. This environmental assessment would satisfy that requirement. There would be no operation of heavy machinery and other equipment such as might be required for site preparation and construction that could cause a minor, temporary increase in air emissions.

Clean Water Act

The Act requires a project/program that involves the discharge of pollutants from a point source into waters of the United States to apply for and obtain a section 402 (NPDES) permit. This project involves no discharge of dredged or fill material and would not require a permit. Aquatic pesticide application either would be approved for use under a NPDES permit or would occur only outside of buffers from "live" waters. The Corps intends to file a Notice of Intent (NOI) under the EPA's Pesticide General Permit (PGP) for any aquatic pesticide applications, and would also need to complete consultation with the U. S. Fish and Wildlife Service (USFWS) before conducting pesticide applications under the PGP. Alternatively, the Corps may choose to consult with both Services prior to filing an NOI should the EPA consultation be insufficient for Corps' purposes. See below for further ESA-sepcific requirements.

Endangered Species Act of 1973, as Amended

The ESA requires all federal departments and agencies to conserve listed species and to utilize their authorities in furtherance of the purposes of the ESA. Section 7(a)(2) of the Act requires that federal agencies consult with the National Marine Fisheries Service (NMFS) and the USFWS to ensure federal actions do not jeopardize continued existence of listed species.

The Corps prepared and submitted a BA on the terrestrial portion of the proposed action to NMFS and USFWS for review. The Corps made a determination of "may affect, not likely to adversely affect" in the BA for the terrestrial portion of the proposed action. Both NMFS and USFWS concurred. (Concurrence letters from NMFS (1 letter – 9 pages) and USFWS (3 letters – total of 29 pages) are available upon request.)

Fish and Wildlife Coordination Act

This Act provides the authority for the U.S. Fish and Wildlife Service's involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. This project was coordinated with the USFWS and NMFS, but a Coordination Act report is not required as the currently proposed undertaking is not a water-resources-related project.

National Environmental Policy Act (NEPA)

The National Environmental Policy Act, or NEPA, was enacted to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that could significantly affect the environment. This environmental assessment was prepared and is being circulated to agencies and the public for review and comment pursuant to requirements of the Act. Full compliance with NEPA would be achieved when a Finding of No Significant Impact (FONSI), if one is determined to be appropriate, is signed.

Federal Insecticide, Fungicide, and Rodenticide Act

The Act requires review and registration of a pesticide used for pest control and management. All pesticides to be used by this program would be selected for use in consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, and are registered with EPA. No additional environmental review under this Act is anticipated.

Federal Noxious Weed Act

The law requires that any environmental assessments or environmental impact statements which may be required to implement plant control agreements be completed within 1 year of the time the need for the document is established. Through the completion of this environmental assessment, the District is seeking to comply with this environmental review requirement.

4.0 CONSULTATION AND COORDINATION

The pest management program as described in the preferred IPM alternative has been consulted upon with the NMFS and FWS (Services) in 2012. Letters of concurrence have been received from the Services for the proposed action. It has also been consulted upon with appropriate Indian Tribes although at this time no tribal comments have been received. Tribal consultation will continue as needed.
This EA is being distributed for public and agency review and comment and is also available through the District website at
www.nww.usace.army.mil./Missions/Projects/PestManagement.aspx.

The distribution list includes the following:

Table 4-1. Distribution List

Name	Organization
Dale Bambrick	National Marine Fisheries Service
Michelle Eames	U.S. Fish and Wildlife Service
Teena Reichgott	Environmental Protection Agency
Terri Costello	Washington Department of Ecology
Tom Schirm	Washington Department of Fish and Wildlife
	Washington State Noxious Weed Control Board
Jeff Dillon	Idaho Department of Fish and Game
John Cardwell	Idaho Department of Environmental Quality
Bill Duke	Oregon Department of Fish and Wildlife
Don Butcher	Oregon Department of Enviornmental Quality (Water Quality)
Kevin Masterson	Oregon Department of Enviornmental Quality (Pesticides)
Gary Crutchfield	City of Pasco
Maxine Whattam	City of Kennewick
	City of Richland
James Martin	City of Clarkston
Joe Kaufman	City of Lewiston (Stormwater)
Tim Barker	City of Lewiston (Parks & Recreation)
Planning Office	City of Orofino
Robb Bousfield	City of Boise

Name	Organization
Marc Stairet	Benton County Weed Control Board
Vic Reeve	Franklin County Weed Control Board
	Walla Walla County Weed Control Board
	Columbia County Weed Control Board
	Garfield County Weed Control Board
	Umatilla County Weed Control Board
Philip Acree	Nez Perce County Weed Control Board
Denny Williams	Clearwater County Weed Control Board
Brian Wilbur	Ada County Weed Control Board
Mir Seyedbagheri	Elmore County Weed Control Board
Mike Bottoms	Boise County Weed Control Board
Nelle Murray	Asotin County Weed Control
Paul Wolf	Washingt State Department of Transportation
Adam Fyall	Benton County Parks and Recreation
Jennie Dickinson	Port of Columbia
Dwight Affleck	Ice Harbor Marina
Debbie Snell	Port of Whitman
Wanda Keefer	Port of Clarkston
David Doeringsfeld	Port of Lewiston
Vikki Bonfield	City of Asotin
David Mahan	Whitman County Parks
Doug Havens	Nez Perce County Commissioner

5.0 REFERENCES

BLM (Bureau of Land Management). 2007. Final programmatic environmental impact statement vegetation treatments using herbicides on Bureau of Land Management lands in 17 western states. Reno, Nevada. Available at: http://www.blm.gov/wo/st/en/prog/more/veg_eis.html

CEQ (Council on Environmental Quality). 1970. Regulation 1500 (Regulation for Implementing NEPA). Available at: http://ceq.hss.doe.gov/nepa/regs/ceq/toc_ceq.htm

Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlilfe Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. Available at: www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm

Engineering Regulation 1130-2-540. 1996. Project Operations – Environmental Stewardship Operations and Mainatenance Guidance and Procedures. Available at: http://publications.usace.army.mil/publications/eng-regs/ER_1130-2-540/toc.htm

(IDEQ, 2002). Idaho Department of Environmental Quality. 2002. Lower North Fork Clearwater River Subbasin Assessment and TMDL. Lewiston, ID. Available at: http://www.deq.idaho.gov/media/451080-clearwater_river_lnf_entire.pdf

(IDEQ, 2009). Idaho Department of Environmental Quality. 2009. Boise-Mores Creek Subbasin Assessment and TMDL. Boise, ID. Available at: http://www.deq.idaho.gov/media/450496-_water_data_reports_surface_water_tmdls_boise_mores_creek_boise_mores_creek_entire.pdf

NMFS (National Marine Fisheries Service). 2012. Pesticide consultations with EPA. Webpage. Updated July 20, 2012. Accessed January 8, 2013, from: http://www.nmfs.noaa.gov/pr/consultation/pesticides.htm

(NatureServe, 2012). NatureServe. 2012. *Blue Mountains Wildlife.* Accessed online December 2012 at http://www.landscope.org/washington/natural_geography/ecoregions/blue_mountains/wildlife/.

(NatureServe, 2009). NatureServe. 2009. *Descriptions of Ecological Systems for Modeling of LANDFIRE Biophysical Settings.* Accessed October 2012 at www.natureserve.org/getData/vegData/nsDescriptions.pdf.

(OPEN, 1999). Oregon Pesticide Education Network (OPEN). 1999. *Diminishing Returns: Salmon Decline and Pesticides.* Access online December 2012 at http://www.pcffa.org/salpest.pdf.

Personal Communication. 2013. (Steve Juul to Mike Francis, January 2 and 3, 2013. Subject: Columbia River and Lower Snaker River 303(d) Listings.)

(USACE, 2012). United States Army Corps of Engineers, Walla Walla District. 2012. *Pest Management Program Biological Assessment.* PM-EC-2011-0019

(USACE, No Date). United States Army Corps of Engineers. No Date. *Walla Walla District Recreation*. Accessed December 2012 at http://www.nww.usace.army.mil/Missions/Recreation.aspx.

(USEPA, 2012) U.S. Environmental Protection Agency, 2012. *Attainment Status for all Counties.* http://www.epa.gov/airquality/greenbook/ancl3.html. Accessed October 2012.

(USFWS, 2000). United States Fish and Wildlife Service. 2000. Pesticides and Birds. Accessed online December 2012 at http://digitalmedia.fws.gov/cdm/ref/collection/document/id/273.

(USFWS, 2012). United States Fish and Wildlife Service. 2012. *Endangered Species Program*. Access online October 2012 at http://www.fws.gov/endangered/

(USFWS, 2009) U.S. Fish and Wildlife Service, Branch of Habitat Assessment. 2009. *National Wetlands Inventory Data.* Available at http://www.fws.gov/wetlands/Data/Data-Download.html

(USGS, 2011) U.S. Geological Survey, Gap Analysis Program. 2011. *National Gap Analysis Program Land Cover Data- Version 2.* Available at http://gapanalysis.usgs.gov/gaplandcover/data/

(WADAE, 2004). Washington State Departments of Agriculture and Ecology. 2004. *Integrated Pest Management Plan for Freshwater Emergent Noxious and Quarantine Listed Weeds.* Accessed October 2012 at http://www.co.thurston.wa.us/tcweeds/documents/IPM_Freshwater_Noxious_Weeds.pdf

APPENDIX A:
ACRONYMS

Acronyms

APHIS	Animal and Plant Health Inspection Service
ATV	All Terrain Vehicle
BA	biological assessment
BMP	best management practices
C	candidate taxon, ready for proposal for listing
CEQ	Council on Environmental Quality
Corps	U.S. Army Corps of Engineers
District	Walla Walla District of the Corps
DO	dissolved oxygen
E	listed as an endangered species
EA	environmental assessment
EPA	Environmental Protection Agency
ER	Engineer Regulations
ESA	Endangered Species Act
FONSI	finding of no significant impact
IPMP	integrated pest management plan
MCR	Middle Columbia River
mph	miles per hour
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
Program	District Pest Management Program
PT	proposed to be listed as a threatened species
R	species in recovery
SHPO	State Historic Preservation Officer
SR	Snake River
SRB	Snake River Basin
T	listed as a threatened species
UCR	Upper Columbia River
USFWS	U.S. Fish and Wildlife Service
WDOE	Washington Department of Ecology

APPENDIX B:
BEST MANAGEMENT PRACTICES

Best Management Practices (Conservation Measures) for Pesticide Application

1. All applicators shall be State licensed or certified, or under the direct visual supervision of a State-licensed or -certified applicator.

2. All application equipment (e.g. booms, backpacks) shall be properly calibrated prior to use according to the chemical manufacturer's suggested application rates printed on the chemical label. Equipment and settings shall be properly maintained for the duration of the contract performance period.

3. Dyes shall be used to reduce the potential for overapplication.

4. Appropriate-sized nozzles shall be used to maximize droplet size and reduce the potential for drift.

5. All concentrated or mixed-solution pesticides shall when not in use be placed in locked storage in closed containers with watertight lids, and placed in secondary containment vessels with capacity of 125 percent of the volume of the pesticide.

6. All mixing for spray bottles and backpack sprayers shall be done within secondary containment of 125 percent capacity of the liquid.

7. Applicators shall work only within permissible wind speeds identified by chemical in Table 12 of the Pest Management Program Biological Assessment (USACE, 2012).

8. Applicators shall work within restrictions related to buffers from water identified in Table 12 of the Pest Management Program Biological Assessment (USACE, 2012).

9. All applications shall be made in temperatures of 90 degrees Fahrenheit or less and in compliance with label conditions.

10. Applications shall not be made within 24 hours prior to a predicted precipitation event sufficient to cause runoff, using the National Weather Service to determine probability of a major precipitation event).

11. All applications will be recorded on Corps pesticide application record or equivalent state form, including GPS coordinates or a GIS polygon (including treatment area/acreage) of application, and compiled at the end of the season for use in reporting, monitoring, and planning for the following year. An annual report will be produced by all contractors,

outgrantees, or other applicators by 1 February of the following year summarizing area of weeds treated by species, chemical used, and amount used (concentrate). This summary report will be forwarded to the Services by the District's Environmental Compliance Section.

12. ATV storage tanks shall be limited to 30 gallons.

13. A spill kit will be available to all persons making applications within 150 feet from the site of the application.

14. Equipment will not be refueled in areas not designated for refueling (e.g., in habitat management units) and within 100 ft of open water. This includes All Terrain Vehicles (ATV), trucks, tractors, and aircraft.

15. All applicators will develop and carry a Spill Prevention and Control Plan approved by the District, or detailed requirements will be explicitly spelled out in contract specifications by the Corps prior to contractor personnel or equipment operation near any stream drainage. The Plan will provide detailed descriptions on how to prevent a spill or ensure effective and timely containment of any chemical spill. The Spill Prevention and Control Plan will include spill control, containment, clean up, and reporting procedures.

16. Each contractor vehicle carrying herbicides shall be equipped with a spill cleanup kit. The cleanup kit shall be capable of containing and holding at least 125 percent of the total mixture and concentrate that are present on the work site. The contractor shall report all details of herbicide spills, exposure incidents, or accidents and/or worker health complaints, if any occur, to the Corps as soon as practicable.

17. No herbicide mixing will be authorized within 100 feet of any body of water or stream channel. Equipment will have either an anti-back siphon valve or an air break on tank fill connections or openings to prevent contamination of on-site water sources.

18. Mixing (other than that of equipment that mixes internally as applications are being made) will be performed within a temporary structure made of impermeable material such as plastic that is capable of containing at least 125 percent of the capacity of the spray tank that is being used, or on appropriate absorbent materials of sufficient capacity to absorb the entirety of that volume of the tank being mixed. Examples of the temporary mixing structure will be a wooden frame lined with plastic sheeting or a child's wading pool.

19. Equipment will be inspected for leaks and cleaned before it crosses any stream. Any detected leaks will be repaired before the equipment crosses the stream or is placed near open water.

20. Equipment will be inspected and cleaned prior to any application of herbicides within 150 feet of open water.

21. Application equipment will be maintained to ensure proper application rates as well as to minimize leakage potential, reduce the potential for drift, and ensure applicator safety. Equipment that will be maintained and visually inspected prior to each application includes but is not limited to hoses, nozzles, backpacks, and booms.

22. The Corps has selected chemicals based on the need in the District, as well as what has been consulted on in the region with known effects. These chemicals will be applied in a manner consistent with the practices of other federal agencies in the Northwest and with what has been identified in standing biological orders from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) to include buffers and wind speeds (Table 12), as well as in accordance with label requirements.

23. All applicators shall comply with all applicable federal, state (OR, ID, & WA) and herbicide manufacturers' directions and requirements for handling herbicides and insecticides, including storage, transportation, application, container disposal, and cleanup of spills.

24. Herbicide treatments to foliage of weed species shall be according to the chemical manufacturers' recommendations for best results. Applicators shall use caution to minimize the application of herbicides to non-target species and structures within the application areas.

25. Any ESA-listed plant that is found will be inventoried, and its location captured either in GIS or by GPS, or both, and put into the District's inventory for future avoidance and planning purposes. Herbicides shall not be applied with aircraft within 300 feet, broadcast within 100 feet, or spot sprayed within 15 feet of ESA-listed plant locations identified during applications. Spraying of targeted species is limited to vinegar or similar within 300 feet or closer to known ESA-listed plant locations.

26. Crossing any open water body (in floating vessels or land vehicles) with spray equipment or chemicals will be avoided if there is any land access (e.g. road or ATV trail) to the proposed treatment areas. If land access is not available or if the land is inaccessible due to steep terrain, all concentrated or mixed chemicals shall be transported within floating secondary containment vessels of 125 percent capacity of the liquid.

27. Disposal of waste materials shall be done in accordance with label restrictions and instructions, and in accordance with all applicable federal, state, and county laws regulations.

28. All invasive, non-native riparian vegetation that is treated with herbicides will be monitored for two years following treatment. If desirable vegetation does not reestablish itself naturally, the Corps will plant or seed new native riparian vegetation in order to reduce the need for future chemical application in the area, and to improve shade and cover for listed fish and their habitat.

29. While off existing roads, motorized herbicide application equipment will be operated only on slopes less than 25 percent in order to minimize risk of soil erosion, spills, or chemical runoff, as well as for safety reasons.

30. No more than one application of picloram will be made on an area in any given year to reduce the potential for picloram accumulation in the soil.

31. No spraying of picloram will be authorized within 100 feet of any flowing waters or areas with shallow water tables. Picloram application shall be avoided within dry ephemeral stream channels and dry roadside ditches that drain directly into fish-bearing streams.

32. The Corps will not spray if snow or ice covers the target foliage.

33. Nozzles and pressures that create droplet sizes of 176 microns or less shall not be used.

34. All aerial applications will be done on the contour. No turns will be allowed over live waters (e.g., flowing ditches, streams, ponds, and springs) even though the booms are turned off at the end of each run.

35. Only aquatic-approved herbicides and surfactants will be authorized for use within 15 feet of live waters or areas with shallow water tables. For example, the only formulations of 2,4-D and glyphosate to be used within 15 ft of water will be the aquatic formulations.

36. Only non-ester forms of 2,4-D will be used (no use of 2,4-D ester formulations will be authorized).

37. Skidoo (pyrethrins, piperonyl butoxide, butane, and propane) and Tempo SC ultra (beta-cyfluthrin) (insecticide) applications will be limited to spot spraying no closer than 15 feet from the water's edge. Applications will not be made when the wind is blowing toward the water, or when the insecticide has the potential to enter the water through drift or runoff.

38. Surveys for Washington ground squirrel will occur prior to using rodenticides in those areas where they are listed as candidates under the ESA. Rodenticides will be used in areas where Washington ground squirrel may occur only after surveys for the species have confirmed no presence, or if suitable habitat does not exist in the treatment area. If

the species is confirmed in an area, the Corps will work with the USFWS and local state wildlife agencies to minimize the potential impacts to Washington ground squirrel.

APPENDIX C:
PROPOSED CHEMICAL USE
(EXCERPT FROM BIOLOGICAL ASSESSMENT)

1.4. Proposed Chemical Use

1.4.1. Historical Use

In a typical year, the District's operating projects (Projects) have chemically treated about 3,200 to 3,600 acres of terrestrial weeds. About every 2 to 3 years, 1,200 to 1,350 of the terrestrial acres would have been treated with helicopter application of herbicides. Approximately 18% of the chemical treatments were carried out by motorized techniques (e.g. ATV or a small tractor with a boom sprayer) and about 35% were done using a backpack sprayer. About 600 acres per year were treated by mechanical techniques such as mowing or digging by hand. The Corps anticipates similar usage in future applications.

Table 17 lists acres, treatment method, and pests for sites treated in 2008, 2009 and/or 2010. These acreages would be similar to what the Corps would expect to treat in the future[10].

Boom indicates a full size pickup or farm tractor was used. A one-time, emergency application near Lyons Ferry to control a large weed outbreak following a wildfire in 2008 accounted for 711 of the acres treated in Little Goose.

Table 17 Acres treated by control technique, average of 2009-2010, except where noted otherwise.

Project or Resource Office	Vegetation Treated (in acres)							Total acres treated
	Shoreline/ Aquatic	ATV	Backpack	Helicopter	Boom	Mechanical/ Manual	Biological	
Lower Granite Pool	1.0	57.5	320.8	1,365.6	428.0	20.0	340.0	2,532.7
Little Goose Pool	3.0	0.0	125.0	300.0	200.0	40.0	1.0	668.0
Lower Monumental Pool	2.0	18.0	612.0	200.0	100.0	20.0	0.0	952.0
Ice Harbor	0.0	30.0	570.0	210.0	9.0	0.0	5.0	824.0
McNary	50.0	25.0	475.0	200.0	5.0	0.0	0.0	755.0
Dworshak	0.5	68.0	50.0	0.0	142.0	0.0	625.0	260.5
Lucky Peak	0.3	11.0	0.3	0.0	0.0	0.0	0.0	11.7
Mill Creek	2.0	65.3	113.0	0.0	0.0	0.0	0.0	180.3
Parks & Campgrounds	*	*	*	*	*	591.8	0.0	591.8
Column Totals	**58.8**	**274.8**	**2,266.1**	**2,275.6**	**884.0**	**671.8**	**971.0**	**6,776.0***

* Acres of vegetation treated in parks and campgrounds were tallied for 2010-2011, but data was not collected by application method. However, chemical applications totaled 782 in park and campground areas, for an average of 391 acres treated annually. This increases the total acres treated to 7,176.

Table 18 summarizes the amount (in percentage) of the District that was treated for pests, and the amount of the District treated with herbicide.

[10] These acreages do not include application made in leased areas or areas where applications on Corps lands have been made by those (i.e. lessees) other that District Natural Resource Managers or contractors working under their direction. The Corps will, from completion of this consultation forward, include and direct applications in leased areas.

1.4. Proposed Chemical Use

Table 18 Percentage of District treated, and percentage of District chemically treated.

Location	Acres	Treated	Chemical Treated	% of District Treated	% District Treated with Herbicide
District Office*	1	0.5	0.5	50.00%	50.00%
McNary	34,157	755	755	2.21%	2.21%
Ice Harbor	11,892	824	819	6.93%	6.89%
Lower Monumental	14,602	952	932	6.52%	6.38%
Little Goose	18,983	668	628	3.52%	3.31%
Lower Granite	16,933	2532.7	2172.9	14.96%	12.83%
Dworshak	47,177	260.5	260.5	0.55%	0.55%
Lucky Peak	9,835	11.7	11.6	0.12%	0.12%
Mill Creek	733	180.3	180.3	24.60%	24.60%
Total Acres for Each Type	154,313	6185.2	5760.3	4.01%	3.73%

*Actual use at the District Headquarters is unknown, so it was assumed that 0.5 acre is treated.

Recent small mammal control has avoided widespread use of baits and gas cartridges because of the hazard to the public and non-target mammals. Most small mammal/rodent control was done with air rifles or trapping.

1.4.2. General

The difference in proposed applications from historic use will be due to changes in pesticide use from ongoing litigation, new scientific information on the effects of pesticide use on ESA-listed fish species, and the Corps' desire to implement a program in the spirit of the Corps' Environmental Operating Principals.

The Corps is now proposing to treat approximately the same acreages, as the need for control is not eliminated, and is not likely to be eliminated in the near future. By virtue of the location of the Corps' Projects (on high order rivers downstream from miles of headwaters), weed species are transported annually in spring runoff events, and seeds are deposited on Corps lands. Our neighbors typically do a good job of controlling weed species on lands adjacent t Corps lands, but the primary vectors are the waterways.

Applications areas are very similar in the Columbia and Snake Rivers (i.e., similar ESA-listed species and critical habitat presence, baseline conditions, flows, noxious weed species, etc.). However, application areas are very different at Dworshak and Lucky Peak, and are distinct. Applications will follow the project description for each area in the District, but application timing, acres treated, and species potentially affected may differ, so the proposed annual applications are being defined by these areas.

Because of the extent of the geographical area of the proposed action, and the differences within each, the Corps has broken the proposed action into five geographical areas within the District. The proposed action is the same across the District, in terms of the project description project (i.e., activities, project elements, treatment methods) (section 1.3), but the amount of each employed in each region may differ:

1.4. Proposed Chemical Use

Proposed chemical treatments for each area were calculated using historic application data. Some adjuvant, dye, and surfactant data was lacking, but it is reasonable to assume that the proposed adjuvants, dyes, and surfactants will be used in chemical applications.

The Corps anticipates annual pest management treatments on up to 8,200 acres in the entire District between March and October each year. Treatments can be made in the same location more than one time during an application season, so combined acres of chemicals applied (not including adjuvants, dyes, surfactants, or vegetable oil) are greater than the actual treated acreage. Meaning that, because of temporally separated treatments in the same location, there will likely be about 19,000 acres worth of chemicals applied to approximately 8,000 acres, over the entire application season.

For example, there will be approximately 750 acres in the Columbia River area treated over the season, 16,500 in the Snake River area, 300 in the Dworshak area, 100 in the Lucky Peak area, and 1,700 in the Mill Creek area. However, the actual acres that get treatment will be approximately 110 in the Columbia, 7,200 in the Snake, 300 in the Dworshak, 100 in the Lucky Peak, and 400 in the Mill Creek areas.

This results in the overall (combined) treatment of 19,350 acres over the season, but these applications would be made on 8,110 acres. All of the proposed treatments will use past treatments as the basis for calculation, but EDRR is a factor in each area, so acreages have been rounded up to account for this. With implementation of the EDRR, the overall combined treatment will be approximately 19,400 acres on 8,200 acres in the District.

1.4. Proposed Chemical Use
1.4.3. Columbia River

1.4.3. Columbia River

The Columbia River region is treated using chemicals as described above. Figure 4 shows the Columbia River geographic region and chemical application areas.

The Corps anticipates making treatments to approximately 110 acres in the Columbia River geographic area, with a total acres annually treated (including multiple treatments in the same locations at different times) of approximately 750 acres (Table 19) between March and October of each year.

Table 19 Proposed chemical treatments in the Columbia River geographic area.

HUC 17020016					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
2,4-D	Herbicide	Amine 4, Hi-Dep, Trimec Classic, Triplet	55	124	129
Aminopyralid	Herbicide	Milestone	570	36	37
Clorpyralid	Herbicide	Transline	672	42	44
Dicamba	Herbicide	Vanquish	704	44	46
Glyphosate	Herbicide	Razor Pro, Roundup	5102	319	332
Imazapyr	Herbicide	Arsenal	384	24	25
Metasulfuron-methyl	Herbicide	Escort XP	2112	52	55
Sulfometuron-methyl	Herbicide	Oust, Oust XP	180.5	11	12
Dye	Dye	HiLite	131	8	8
Surfactant	Surfactant	Grounded	144	9	9
Chlorpyrifos	Insecticide	Dursban Pro		4	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		4	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		10	

HUC 17070101					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
2,4-D	Herbicide	Hi-Dep	14	5	5
Aminopyralid	Herbicide	Milestone	15	2	2
Metsulfuron methyl	Herbicide	Amtide MSM 60 DF Herbicide	14	1	1
Sulfometuron-methyl	Herbicide	Oust XP	2	1	1
Triclopyr	Herbicide	Garlon 3A	1	1	1
Dye	Dye	Blue Marker Dye	14	1	1
Surfactant	Surfactant	Agri-Dex Spray Adjuvant	2	2	2
Chlorpyrifos	Insecticide	Dursban Pro		4	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		4	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		10	

1.4. Proposed Chemical Use
1.4.3. Columbia River

HUC 17030003					
Active Ingredient	Use	Example	Acres	Amount	
				pts	lb
2,4-D	Herbicide	Hi-Dep, Trimec Classic, Triplet	64	127	132
Aminopyralid	Herbicide	Milestone	49	15	16
Clorpyralid	Herbicide	Transline	11	42	44
Dicamba	Herbicide	Vanquish	39	140	146
Glyphosate	Herbicide	Razor Pro, Portfolio	64	258	269
Metasulfuron-methyl	Herbicide	Escort XP	29	116	121
Sulfometuron-methyl	Herbicide	Echelon 4SC, Oust, Outpost 22k	21	28	29
Dye	Dye	Blue Marker Dye	19	1	1
Surfactant	Surfactant	Grounded	1	1	1
Chlorpyrifos	Insecticide	Dursban Pro		4	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		4	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		10	

1.4. Proposed Chemical Use
1.4.4. Snake River

1.4.4. Snake River

The Snake River region is treated using chemicals as described above. Figure 5 shows the Snake River geographic region and chemical application areas.

The Corps anticipates making treatments to approximately 7,200 acres in the Snake River geographic area, with a total acres annually treated (including multiple treatments in the same locations at different times) of approximately 16,500 acres (Table 20) between March and October of each year.

Table 20 Proposed chemical treatments in the Snake River geographic area.

HUC 17060107					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
2,4-D	Herbicide	Amine 4, Five Star, Hardball, Hi-Dep	974	299	309
Aminopyralid	Herbicide	Milestone	2185	322	335
Chlorsulfuron	Herbicide	Telar XP	130	4	4
Dicamba	Herbicide	Vanquish, Banvel	85	68	71
Glyphosate	Herbicide	Roundup Original/Pro/RT3/Ultramax	195	200	208
Imazapyr	Herbicide	Habitat	359	18	18
Metsulfuron methyl	Herbicide	Amtide MSM 60 DF, Ally Extra	1819	30	31
Picloram	Herbicide	Tordon 22K	667	1442	1502
Sulfometuron-methyl	Herbicide	Oust XP, Oust, Outpost 22k	587	334	347
Triclopyr	Herbicide	Garlon 4	415	36	37
Adjuvant	Adjuvant	M-90, Bronc Max, R-11, Interlock, Agri-Dex	3728	342	357
Dye	Dye	Blue Marker Dye	137	3	3
Surfactant	Surfactant	Grounded	7	11	11
Chlorpyrifos	Insecticide	Dursban Pro		4	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		4	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		10	
TOTAL ACRES TREATED			3596		

HUC 17060306					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
Aminopyralid	Herbicide	Milestone	14	4	4
Glyphosate	Herbicide	Roundup Original/Pro/RT3/Ultramax	14	8	8
Adjuvant	Adjuvant	R-11	14	2	2
Chlorpyrifos	Insecticide	Dursban Pro		4	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		4	
Chlorpyrifos	Insecticide	Dursban Pro		2	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		2	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		5	
TOTAL ACRES TREATED			14		

1.4. Proposed Chemical Use
1.4.4. Snake River

HUC 17060103					
Active Ingredient	Use	Example	Acres	Amount	
				pts	lb
2,4-D	Herbicide	Amine 4, Five Star, Hardball, Hi-Dep	94	76	78
Aminopyralid	Herbicide	Milestone	478	19	20
Chlorsulfuron	Herbicide	Telar XP	4	1	1
Dicamba	Herbicide	Banavel	33	1	1
Glyphosate	Herbicide	Roundup Original/Pro/RT3/Ultramax	59	12	13
Imazapyr	Herbicide	Habitat	65	5	5
Metsulfuron methyl	Herbicide	Amtide MSM 60 DF, Ally Extra	314	1	1
Sulfometuron-methyl	Herbicide	Oust XP	1	1	1
Triclopyr	Herbicide	Garlon 4	142	10	10
Adjuvant	Adjuvant	M-90, Bronc Max, R-11, Interlock, Agri-Dex	661	45	47
Surfactant	Surfactant	Grounded	1	2	2
Chlorpyrifos	Insecticide	Dursban Pro		4	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		4	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		10	
TOTAL ACRES TREATED			588		

HUC 17060110					
Active Ingredient	Use	Example	Acres	Amount	
				pts	lb
2,4-D	Herbicide	Amine, Five Star, Hardball, Hi-Dep	2570	39	41
Aminopyralid	Herbicide	Milestone	2386	112	117
Dicamba	Herbicide	Vanquish, Banvel	319	78	81
Glyphosate	Herbicide	Roundup Original/Pro/RT3/Ultramax	964	89	93
Imazapic	Herbicide	Plateau	2	6	6
Metsulfuron methyl	Herbicide	Amtide MSM 60 DF, Ally Extra	113	5	5
Picloram	Herbicide	Tordon 22K	185	1	1
Sulfoeturon-methyl	Herbicide	Oust XP, Oust, Outpost 22k	874	147	153
Triclopyr	Herbicide	Garlon 4	116	48	49
Adjuvant	Adjuvant	M-90, Bronc Max, R-11, Interlock, Agri-Dex	975	321	334
Dye	Dye	Blue Marker Dye	2346	178	186
Surfactant	Surfactant	Grounded	147		
Chlorpyrifos	Insecticide	Dursban Pro		4	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		4	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		10	
TOTAL ACRES TREATED			2928		

1.4.5. Dworshak

Figure 6 shows the Dworshak geographic region and chemical application areas.

Chemical treatments at Dworshak consist primarily of applications adjacent to roads, and applications in campground areas (see Appendix F for 2011 treatment maps at Dworshak, which the Corps anticipates to reflect the proposed treatments). The Corps does not anticipate a reduction in the need for applications in the future, so the projected applications will be similar to what has been done in the past. The Corps intends to treat approximately 300 acres annually at Dworshak. Annual variability will be accounted for in pre and post season reporting.

Herbicide treatments to foliage of weed species shall be accomplished according to the chemical manufacturer's recommendations for best results. Applications on property surrounding Dworshak Dam and Reservoir will start in late spring when most noxious weed species are in the rosette to early bolt stage of development. Applications to Rush Skeletonweed and Meadow Knapweed will occur at different times in order to allow enough growth to make them easier to identify. Applications to Rush Skeletonweed will occur starting in July. Applications to Meadow Knapweed will occur in September. Applicators shall use caution to minimize the application of herbicides to non-target species and structures within all application areas.

Table 21 Dworshak application timing.

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
General Applications								
Rush Skeletonweed								
Meadow Knapweed								

Priority target species at Dworshak include:

- Whitetop (*Cardaria draba*)
- Canada thistle (*Cirsium arvense*)
- Dalmation toadflax (*Linaria dalmatica ssp. Dalmatica*)
- Diffuse knapweed (*Centaurea diffusa*)
- Spotted knapweed (*Centaurea stoebe*)
- Houndstongue (*Cynoglossum officinale*)
- Bull thistle (*Cirsium vulgare*)
- Yellow starthistle (*Centaurea solstitialis*)
- Rush skeletonweed (*Chondrilla juncea*)
- Dyer's woad (*Isatis tinctoria*)
- Field bindweed (*Convolvulaceae arvensis*)
- Meadow knapweed (*Centaurea debeauxii*)
- Yellow hawkweed (*Hieracium caespitosum*)
- Poison hemlock (*Conium maculatum*)
- Scotch broom (*Cytisus scoparius*)
- Common cocklebur (*Xanthium strumarium*)

1.4. Proposed Chemical Use
1.4.5. Dworshak

The Meadow knapweed, Poison hemlock and the hawkweed species are prevalent in recreation areas and are treated each year. The others are found sporadically, but a few plants are typically found every couple of years and they are treated as soon as they are found.

Common cocklebur is gaining a great deal of ground over the last few years due to cattle trespasses, and it is likely to become one of Dworshak's largest problem plants in the near future. It is mainly found below the maximum pool elevation (1,600 msl) in several areas (from Elk Creek to Grandad) around the reservoir. There are currently about 20 acres documented, but it is highly mobile due to the fluctuating water levels and its ability to float and stick to almost anything. Since it is found mainly within 20 feet of max pool, it will be treated it with imazapyr (Habitat or another similar label) (3 - 4 pints per acre) or glyphosate (Rodeo or another similar label) (1 1/2 - 2 1/2 pints per acre) in the early fall when the reservoir is drawn down 60 to 80 feet. In most areas, this would result in a 100-foottreatment distance from the actual water line.

The Corps anticipates treating 300 acres in the Dworshak geographic area, with a total amount annually treated (including multiple treatments in the same locations or overlapping treatments) of up to 300 acres (Table 22 between May and September of each year).

Table 22 Proposed chemical treatments in the Dworshak geographic area.

HUC 17060308					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
2, 4-D	Herbicide	Hardball, Platoon	49	138	143
Aminopyralid	Herbicide	Milestone	55	23	24
Chlorsulfuron	Herbicide	Telar XP	2	0	0
Clopyralid	Herbicide	Transline	1	0	0
Dicamba	Herbicide	Vanquish	15	116	121
Glyphosate	Herbicide	Gly Star Pro	17	33	34
Metsulfuron methyl	Herbicide	Amtide MSM 60 DF	47	4	4
Sulfometuron-methyl	Herbicide	Oust XP, SFM 75	74	23	24
Adjuvant	Adjuvant	M-90, Bronc Max, R-11, Interlock, Agri-Dex, Interactive, Dyne-Amic	74	50	52
TOTAL ACRES TREATED			328		

HUC 17060306					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
2, 4-D	Herbicide	Amine 4	1	8	8
Aminopyralid	Herbicide	Milestone	2	1	1
Clopyralid	Herbicide	Transline	1	4	4
Glyphosate	Herbicide	Remuda, Credit Extra	4	32	34
Sulfometuron-methyl	Herbicide	Oust XP	1	21	21
Triclopyr	Herbicide	Element 3A	1	4	4
Adjuvant	Adjuvant	Spreader 90	20	60	64
TOTAL ACRES TREATED			15		

1.4.6. Lucky Peak

Figure 7 shows the Lucky Peak geographic region and chemical application areas. The figure shows extensive application areas, but it is simply showing outgrant areas. Not all areas will be treated. Data for specific locations of past treatments at Lucky Peak was lacking, but applications will generally be made at Sandy Point, the administration area at and around the dam, Barclay Bay, Turner Gulch, Viewpoint, Spring Shores, Mack's Creek, and Robie Creek. These are all developed areas, and mostly used for recreation.

Chemical treatments at Lucky Peak consist primarily of applications adjacent to roads, and applications in campground and recreation areas (see Appendix G for 2009 treatment maps at Lucky Peak, which the Corps anticipates to reflect the proposed treatments).

Priority target species at Lucky Peak include those listed above, with a focus on:

- Whitetop (*Cardaria draba*)
- Puncturevine (*Tribulus terrestris*)
- Rush skeletonweed (*Chondrilla juncea*)

Whitetop and Rush skeletonweed are the major problem species at Lucky Peak. Puncturevine has also been treated, and will continue to be an issue, near the water's edge.

The Corps anticipates making treatments to approximately 100 acres in the Lucky Peak geographic area, with a total acres annually treated (including multiple treatments in the same locations at different times) of approximately 100 acres (Table 23) between March and October of each year.

Table 23 Proposed chemical treatments in the Lucky Peak geographic area.

HUC 17050112					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
2, 4-D	Herbicide	Amine 2, 4-D	1	0	0
Aminopyralid	Herbicide	ForeFront	5	16	16
Chlorsulfuron	Herbicide	Telar	1	0	0
Glyphosate	Herbicide	Roundup	1	4	4
Imazapyr	Herbicide	Aresnal	2	15	16
Adjuvant	Adjuvant	Syltac	5	5	6
Dye	Dye	Bullseye	6	15	15
Chlorpyrifos	Insecticide	Dursban Pro		2	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		2	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		5	
TOTAL ACRES TREATED			21		

1.4. Proposed Chemical Use
1.4.6. Lucky Peak

HUC 17050114					
Active Ingredient	Use	Example	Acres	Amount	
				pts	lb
2, 4-D	Herbicide	Amine 2, 4-D	3	11	12
Aminopyralid	Herbicide	ForeFront	1	0	0
Chlorsulfuron	Herbicide	Telar	1	0	0
Clopyralid	Herbicide	Confront	7	15	15
Glyphosate	Herbicide	Roundup	42	150	156
Imazapyr	Herbicide	Aresnal	20	150	156
Triclopyr	Herbicide	Confront	7	15	15
Adjuvant	Adjuvant	Syltac	7	7	7
Dye	Dye	Bullseye	9	14	14
Chlorpyrifos	Insecticide	Dursban Pro		2	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		2	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		5	
TOTAL ACRES TREATED			80		

1.4. Proposed Chemical Use
1.4.7. Mill Creek

1.4.7. Mill Creek

Figure 8 shows the Mill Creek geographic region and chemical application areas. The figure shows extensive application areas, but it is showing a combination of application areas from records and recreation areas. Not all areas will be treated every year. Data for specific locations of past treatments at Mill Creek was somewhat lacking, but applications will generally be made along the roads on the levees, along roads, along trails, at Bennington Dam, around operational structures, and at administration sites. These are all developed areas, and mostly used for operations or recreation.

The Corps anticipates treating 400 acres in the Mill Creek geographic area, with a total amount annually treated (including multiple treatments in the same locations or overlapping treatments) of 1,700 acres (Table 24) between March and October of each year.

Table 24 Proposed chemical treatments in the Mill Creek geographic area.

HUC 17060110					
Active Ingredient	**Use**	**Example**	**Acres**	**Amount**	
				pts	**lb**
2,4-D	Herbicide	Amine 4, Endrun, Five Star, Hardball	63	45	47
Aminopyralid	Herbicide	Milestone	490	19	20
Glyphosate	Herbicide	Roundup RT3	419	31	32
Imazapic	Herbicide	Plateau	2	6	6
Metsulfuron methyl	Herbicide	Amtide MSM 60 DF Herbicide, Escort XP	45	1	1
Sulfometuron-methyl	Herbicide	Oust	627	15	16
Triclopyr	Herbicide	Element 3A, Garlon 3A	23	19	19
Adjuvant	Adjuvant		487	39	41
Dye	Dye	Hi-Dep, Highlight	52	7	7
Surfactant	Surfactant	Dyne-Amic	38	1	1
Chlorpyrifos	Insecticide	Dursban Pro		2	
Beta-cyfluthrin	Insecticide	Tempo SC Ultra		2	
Pyrethrins, Piperonyl Butoxide	Insecticide	Skidoo		5	
TOTAL ACRES TREATED			1,669		

APPENDIX D:
VEGETATIVE COMMUNITIES OF THE AFFECTED AREA

3.2.3.1.2 Disturbed or Modified Land

Disturbed or modified land within the project area consists of developed land, harvested land, agricultural land, and introduced species. Harvested forests in the project area include northwestern conifer, shrub, and grass/forb regeneration in the Dworshak area.

Introduced vegetation includes noxious and nuisance weeds found in all vegetative community types. Invasive species are usually destructive and difficult to manage and they generally cause ecological and economic harm to nearby native vegetation communities via competitive displacement. Within the project area, invasive plants have outcompeted native plants n many areas and will continue to do so without effective management. Many locally invasive species have the ability to thrive and spread aggressively under the dominant semi-arid conditions and typically have an ecological competitive due to aggressive growth and reproductive habits as well as an absence of natural predators including insects, diseases, and foraging animals. Invasive species can reduce the native vegetation and threaten biodiversity (WADAE, 2004). Noxious and nuisance weeds managed in the project area are described above under 1.1 Background.

3.2.3.1.2 Beach, shore, and sand

Beach and shorelines found within the project area are typically composed of either migrating, bare dunes; anchored dunes with sparse to moderately dense vegetation; or stabilized dunes. Vegetation found here is often adapted to shifting, coarse-textured substrates and forms patchy or open grasslands, shrublands or steppe, and occasionally woodlands. Common vegetation includes Indian ricegrass (*Achnatherum hymenoides*), sand sagebrush (*Artemisia filifolia*), basin big sagebrush *(Artemisia tridentata*), flowering saltbush (*Atriplex canescens*), needle-and-thread (*Hesperostipa comata*), yellow wildrye (*Leymus flavescens*), and alkali sacaton (*Sporobolus airoides*) (NatureServe and LANDFIRE, 2009).

3.2.3.1.3 Cliff, canyon, and talus

Cliffs, canyons, and taluses found within the project area consist of barren and sparsely vegetated communities. Typically, these areas are dry and vegetation reflects the surrounding vegetation and includes a scatter of trees and/or shrubs. (NatureServe and LANDFIRE, 2009).

3.2.3.1.4 Forested habitat

Forested habitat within the project area consists of conifer-dominated forests and woodlands as well as deciduous-dominated forests and woodlands. Conifer-dominated forests are upland forests that consist mostly of trees that withstand cold, long, snowy winters and warm, humid summers (NASA, No Date). Dominant trees found in this community can include either a mix of ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), Engemann spruce (*Picea engelmannii*), and Rocky Mountain fir (*Albies lasicocarpa*) or a mix of western hemlock (*Tsuga heterophylla*) and Pacific redcedar (*Thuja plicata*). Other common vegetation found in these forests can include western white pine (*Pinus monticola*), grand fir (*Abies grandis*), Pacific yew (*Taxus brevifolia*), and western larch (*Larix occidentalis*). Understory vegetation can be shrubby, consisting of twinflower (*Linnaea borealis*), mountain lover (*Paxistima myrsinites*), gray alder (*Alnus incana*), Rocky Mountain maple (*Acer glabrum*), bunchberry dogwood (*Cornus Canadensis*), basin big sagebrush, greenleaf manzanita (*Arctostaphylos patula*), common juniper (*Juniperus communis*), mallow ninebark (*Physocarpus malvaceus*),

kinnikinnick (*Arctostaphylos uva-ursi*), chokecherry (*Prunus virginiana*), Saskatoon serviceberry (*Amelanchier alnifolia*), and Carex species. Forbs, ferns, and grasses can also be found in the understories of Conifer Forests (NatureServe and LANDFIRE, 2009).

Deciduous-dominated forests and woodlands within the project area consist of shrubland and upland communities found within the upper montane and lower subalpine zones of the Rocky Mountains or on steep slopes of canyons and in areas with some soil development. Dominant vegetation can include a mix of curl-leaf mountain mahogany (*Cercocarpus ledifolius*), basin big sagebrush, antelope bitterbrush (*Purshia tridentata*) and quaking aspen (*Populus tremuloides*) or a mix of mallow ninebark *(Physocarpus malvaceus*), bitter cherry (*Prunus emarginata*), chokecherry, roses (*Rosa* spp.), smooth sumac (*Rhus glabra*), Rocky Mountain maple, (*Amelanchier alnifolia*), mountain snowberry (*Symphoricarpos oreophilus*), oceanspray (*Holodiscus discolor*), common snowberry (*Symphoricarpos albus*) rusty menziesia (*Menziesia ferruginea*), alderleaf buckthorn (*Rhamnus alnifolia*), and thinleaf huckleberry (*Vaccinium membranaceum*). Besides shrubs, low-elevation grasslands and sagebrush shrublands can also be found in these areas (NatureServe and LANDFIRE, 2009).

3.2.3.1.5 Semi-arid, shrub/steppe habitat

Shrubland and steppe communities found within the project area consist of sagebrush-dominated shrubland, scrub shrubland, and steppe. Sagebrush-dominated shrublands occur either in extreme soil moisture conditions or in basins between mountain ranges, plains, and foothills where soils are typically deep, well drained and non-saline. Vegetation found in extreme soil moisture includes onespike danthonia (*Danthonia unispicata*), squirreltail (*Elymus elymoides*), Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), and species of garlics (*Allium* spp.), pussytoes (*Antennaria* spp.), and sunflowers (*Balsamorhiza* spp.). Vegetation communities found on well-drained soils are dominated by basin big sagebrush, junipers (*Juniperus* spp.) and greasewood (*Sarcobatus vermiculatus*) (NatureServe and LANDFIRE, 2009).

Scrub shrubland communities found in the project area are characterized by open to moderately dense shrubs dominated by *Atriplex* species or spiny hopsage (*Grayia spinosa*). The herbaceous layer varies from sparse to moderately dense and is dominated by perennial grasses. Steppe vegetative communities consist of both grassland and shrub-dominated areas. Grassland steppes are extensive grasslands defined by frequent fires and the absence of or low cover of shrubs over large areas. The grassland is dominated by perennial bunch grasses and forbs including yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), and species of *Tetradymi* and *Artemisia*. Shrub steppe found within the project area occurs in a range of shallow to deep soils. Common shrubs include species of *Artemisia*, *Eriogonum*, *Symphoricarpos*, and *Amelanchier* as well as antelope bitterbrush, shadscale saltbush (*Atriplex confertifolia*), basin big sagebrush, yellow rabbitbrush, greasewood, Greene's rabbitbrush (*Chrysothamnus greenei*), and winterfat (*Krascheninnikovia lanata*). Grasses and forbs also occur and may dominate the herbaceous vegetation of shrub steppes (NatureServe, and LANDFIRE 2009).

3.2.3.1.6 Grassland habitat

Upland grasslands and prairies found within the project area occur in the lower montane to subalpine zones; on canyons and valleys along the Columbia Basin; on rolling topography of

loess hills and plains; or on swales, playas, mesas, alluvial flats, and plains. Montane grasslands are dominated either by forbs or by a mixture of perennial bunch grasses and forbs including fleabanes (*Erigeron* spp.), asters (*Asteraceae* spp.), western meadow-rue (*Thalictrum occidentale*), sitka valerian (*Valeriana sitchensis*), western coneflower (*Rudbeckia occidentalis*), arrowleaf balsam (*Balsamorhiza sagittata*), tufted hairgrass (*Deschampsia caespitosa*), prairie Junegrass, (*Geum triflorum*), bluebell bellflower (*Campanula rotundifolia*), littleleaf pussytoes (*Antennaria microphylla*), bluebunch wheatgrass (*Pseudoroegneria spicata*), rough fescue (*Festuca campestris*), Idaho fescue, needle-and-thread, Indian ricegrass, Richardson's needlegrass (*Achnatherum richardsonii*), short bristle needle and thread (*Hesperostipa curtiseta*), basin wildrye (*Leymus cinereus*), western wheatgrass (*Pascopyrum smithii*), threadleaf sedge (*Carex filifolia*) and timber oatgrass (*Danthonia intermedia*).

Other grasslands are dominated by grasses, cacti, and some forbs including bluebunch wheatgrass, Idaho fescue, needle-and-thread, wild rye (*Leymus* spp.), Sandberg bluegrass, basin big sage brush, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), blackrush (*Coleogyne* spp.), broom snakeweed (*Gutierrezia sarothrae*), winterfat, Indian ricegrass, three-awns (*Aristida* spp.), blue grama (*Bouteloua gracilis*), needle-and-tread, and James' galleta (*Pleuraphis jamesii*) (NatureServe and LANDFIRE, 2009).

3.2.3.1.7 Riparian habitat

Riparian habitat includes naturally occurring riparian habitats as well as artificial upland or lowland riparian vegetation within the project area that is found along "perched" benches of land where irrigation has been installed. Natural riparian vegetation within the project area is no more than a few feet wide and found in small areas where large amounts of silt have accumulated and in short stretches along rivers just below dams (USACE, 2012). Important trees include black cottonwood (*Populus balsamifera* ssp. *Trichocarpa*), white alder (*Alnus rhombifolia*), quaking aspen, netleaf hackberry (*Celtis laevigata* var. *reticulate*), paper birch (*Betula papyrifera*), black spruce (*Picea mariana*), white spruce (*Picea glauca*), grand fir, Pacific redcedar, western hemlock, water birch (*Betula occidentalis*) white fir (*Abies concolor*), narrowleaf willow (*Salix exigua*), arryo willow (*Salix lasiolepis*), Lemmon's willow (*Salix lemmonii*), and Douglas fir. Common shrubs include black hawthorn (*Crataegus douglasii*), Lewis' mock orange (*Philadelphus lewisii*), red osier dogwood (*Cornus sericea*), Pacific willow (*Salix lucida* ssp. *Lasiandra*), Missouri River willow (*Salix eriocephala*), Nootka Rose (*Rosa nutkana*), Woods' rose (*Rosa woodsii*), Saskatoon serviceberry (*Amelanchier alnifolia*), chokecherry, Rocky Mountain maple, gray alder, devilsclub (*Oplopanax horridus*), common ladyfern (*Athyrium filix-femina*), western oakfern (*Gymnocarpium dryopteris*), arrowleaf ragwort (*Senecio triangularis*) and common snowberry. Forbs and grasses in this community can include sedges, junipers, tufted hairgrass, slender wheatgrass (*Elymus trachycaulus*), fowl mannagrass (*Glyceria striata*), Rocky Mountain iris (*Iris missouriensis*), starry false lily of the valley (*Maianthemum stellatum*), and Fender's meadow-rue (*Thalictrum fendleri*) (NatureServe and LANDFIRE, 2009).

Riparian and floodplain areas within the project areas that remain dry for most of the growing season are typically found near drainages on stream terraces and flats or sparsely vegetated playas. These areas are usually a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by greasewood (NatureServe and LANDFIRE, 2009).