BLM

Cottonwood Integrated Weed Treatment Program

ENVIRONMENTAL ASSESSMENT

Dalmation toadflax biological control release site

Cottonwood Field Office
9015
DOI-BLM-ID-C020-2011-0017-EA

January 2012

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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Cover Photo: Dalmation toadflax biological control site; Photo by Lynn Danly

Contents

Acronyms

ACEC	Area of Critical Environmental Concern
AI	Active Ingredient
APHIS	Animal and Plant Health Inspection Service
ATV	All Terrain Vehicle
BA	Biological Assessment
BLM	Bureau of Land Management
CFO	Cottonwood Field Office
CFR	Code of Federal Regulations
CRMP	Cottonwood Resource Management Plan
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
EO	Executive Order
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
ESA	Endangered Species Act
FO	Field Office
FONSI	Finding of No Significant Impact
FEIS	Final Environmental Impact Statement
FS	Forest Service
FWS	Fish and Wildlife Service
HHRA	Human Health Risk Assessment
IDT	Interdisciplinary Team
IDWR	Idaho Department of Water Resources
ISDA	Idaho State Department of Agriculture
IPM	Integrated Pest Management
IWM	Integrated Weed Management
LAU	Lynx Analysis Unit
MCL	Maximum Contaminant Level
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
PA	Proposed Action
PCE	Primary Constituent Elements
PEIS	Programmatic Environmental Impact Statement
PER	Programmatic Environmental Report
POEA	Polyoxyethyleneamine
PPE	Personal Protective Equipment
PRMP	Proposed Resource Management Plan
RCA	Riparian Conservation Area
RNA	Research Natural Areas
ROD	Record of Decision
SOP	Standard Operating Procedure
USDA	United States Department of Agriculture
USDI	United States Department of Interior
WMA	Weed Management Area
WSA	Wilderness Study Area

1 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The Bureau of Land Management (BLM), Cottonwood Field Office (CFO), is proposing to update and continue implementation of an integrated weed management program on public lands in north central Idaho. This Environmental Assessment (EA) has been prepared for compliance with the National Environmental Policy Act (NEPA), to disclose and analyze the environmental consequences of using currently available chemical, mechanical and biological noxious and invasive weed treatments. The EA assists the BLM in project planning and making a determination as to whether any “significant” impacts, as defined in the Council on Environmental Quality regulations to implement the NEPA (40 CFR 1508.27), could result from implementation of the proposed action. An EA provides evidence for determining whether the BLM decision maker may issue a “Finding of No Significant Impact” (FONSI), or a notice of intent to prepare an Environmental Impact Statement (EIS), prior to implementing the action.

This EA tiers to the analysis for the Cottonwood Resource Management Plan (CRMP) and Final EIS (BLM 2009). Based on review of the proposed weed treatment program as described and analyzed in this EA, the decision maker will determine if the proposed action conforms to the approved CRMP, and would not result in any significant environmental impacts (effects) beyond those already considered in the CRMP EIS. If so, then BLM would issue a Decision Record (DR) to approve implementation of the selected action(s).

1.2 Type of Action

The actions analyzed in this EA are chemical, manual and biological weed control treatments proposed for implementation as part of an integrated weed management (IWM) program on lands managed by the CFO.

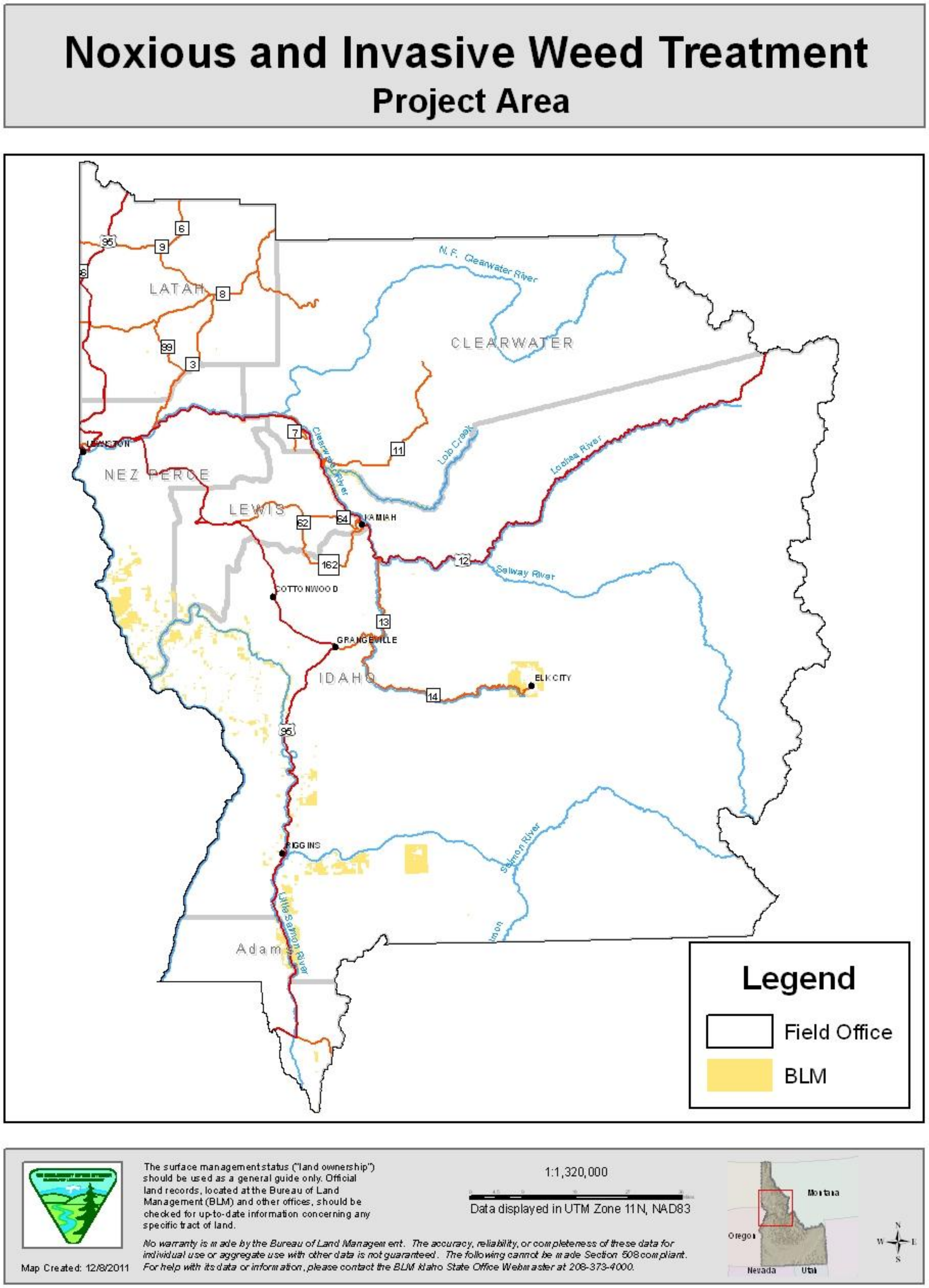
1.3 Location of Proposed Action

Noxious and invasive weed control would take place on public lands managed by the CFO in north-central Idaho (See Map 1-1).

1.4 Background

Five cooperative weed management areas (WMA) are currently organized within the CFO. The CFO coordinates with these groups to implement prioritized IWM projects across boundaries. These partnerships include local county weed supervisors, state and federal agencies, private individuals and groups, and the Nez Perce Tribe. Each group develops a management plan and implements IWM activities through an annual operating plan. An end of year report documents the activities accomplished by each group and includes monitoring information to assist in planning for the next year’s activities. Management plans include the six commonly recognized components of IWM; education and awareness activities, inventory, prevention and early detection, control methods, monitoring, and revegetation. As a result a large effort is taking place to develop and implement a strategy to control invasive species within the CFO. Local cooperators have recognized the impacts invasive species are having on the natural resources and values of the area.

Map 1-1


Noxious and Invasive Weed Treatment
Project Area
LATAH
CLEARWATER
NEZ PERCE
LEWIS
IDAHO
Adam
N.F. Clearwater River
Clearwater River
Lolo Creek
Lochsa River
Selway River
Salmon River
Little Salmon River
KAMIAH
COTTONWOOD
GRANGEVILLE
ELK CITY
RIGGINS
95
6
9
8
99
3
7
11
62
64
162
12
13
14
Legend
Field Office
BLM
The surface management status ("land ownership") should be used as a general guide only. Official land records, located at the Bureau of Land Management (BLM) and other offices, should be checked for up-to-date information concerning any specific tract of land.
1:1,320,000
Data displayed in UTM Zone 11N, NAD83
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed. The following cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000.
Map Created: 12/8/2011
Montana
Oregon
Nevada
Utah
N
W
E
S

Invasive weeds are highly competitive and can often out-compete native vegetation, especially on recently disturbed sites. Left unchecked, weeds can create monocultures that degrade or reduce soil productivity, water quality and quantity, native plant communities, wildlife habitat, wilderness values, recreational opportunities, livestock forage, and be detrimental to agriculture and commerce (BLM 2007a). These affects are consistent with the impacts of noxious weeds related in the Interior Columbia Basin Ecosystem Management Project EIS 2000 Chapter 2, "Vegetation in both forestlands and rangelands . . . is being invaded by noxious weeds at an accelerating rate, jeopardizing consumptive and non-consumptive uses and public expectations, including livestock grazing, timber production, and wildlife and scenery viewing. Noxious weeds reduce these uses by displacing native plant species and lessening natural biological diversity, degrading soil integrity, nutrient cycling and energy flow, and interfering with site recovery mechanisms (such as seed banks) that allow a site to recover following disturbance." An invasive species is defined as a species that is 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). Noxious weeds are invasive species that have been designated "noxious" by law. Invasive species typically germinate under a wide variety of conditions and show fast seedling growth; thus, they establish quickly and take up water and nutrients that become unavailable for native species (BLM and USFS 2000). In a relatively short time, an invasive species can dominate specific environments of the landscape where they may comprise 70%-100% of the plant community. With that domination, all other organisms, including endangered species that depended upon the previous community diversity may be displaced or eliminated (Wilson & Young 1996). The cost and complexity of managing these weeds and restoring native habitats increases greatly the longer these situations are not adequately addressed. The State of Idaho currently has sixty-four species of weeds on the noxious weed list. These weeds require some kind of control action under state law. The CFO may implement IWM activities for plants not on the list but which are invasive in nature and require control. Examples of these weeds are Russian olive, cheatgrass, and Himalayan blackberry.

1.5 Purpose of and Need for Action

The purpose of the proposed action is to update and continue the implementation of an IWM program to control the expansion of noxious weeds and invasive species on public lands managed by the CFO of the BLM.

The action is needed because of the current invasive species situation in the field office, the expansion of the state noxious weed list from thirty-six to sixty-four species, emphasis by local publics and cooperators to coordinate in weed management, a new land use planning document, and changes in available tools to control weeds. The Cottonwood Resource Management Plan (CRMP) identifies a goal to "Prevent establishment of new invasive plant species and reduce infested acreage of established invasive plant species." New tools and updated protocols are available for use on public lands as described in the "*Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* 2007(PEIS) (BLM 2007a) and *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report* 2007(PER) (BLM 2007b).

1.6 Land Use Plan Conformance

The proposed action conforms to Cottonwood Resource Management Plan, as it was approved on December 21, 2009. The proposed IWM program has been planned to implement the following decisions from pages 22-23 of the CRMP (BLM 2009).

Table 1. Cottonwood RMP Decision for Vegetation—Weeds (VW)

Goal VW-1—Prevent establishment of new invasive plant species and reduce infested acreage of established invasive plant species.	
Objective VW-1.1—Work with partners in coordinated weed management areas to develop and implement annual treatment strategies.	**Action VW-1.1.1—**Prioritize the use of BLM resources in areas with established partnerships.
	Action VW-1.1.2—Support or conduct weed inventories with partners to provide for the efficient prioritization of weed control activities.
	Action VW-1.1.3—Support or conduct education and awareness activities with partners. Utilize local, state, and national expertise and outreach opportunities.
	Action VW-1.1.4—Implement prevention activities (**Appendix A**, Best Management Practices for Weed Prevention) as part of field activities to avoid contributing to spread of invasive plants from BLM actions.
	Action VW-1.1.5—Implement invasive plant control methods including, but not limited to, physical, mechanical, biological, and chemical control.
	Action VW-1.1.6—Rehabilitate treated areas to provide competitive plant communities and avoid establishment of invasive plant populations.
	Action VW-1.1.7—Monitor control and rehabilitation projects to document results and provide a record for future activities. When funding is available, control activities will be monitored annually and rehabilitation activities will be monitored two years post treatment.
Objective VW-1.2—Outside of weed management areas, implement treatment strategies in accordance with other resource goals.	**Action VW-1.2.1—**Conduct weed inventories to provide for the efficient prioritization of weed control activities.
	Action VW-1.2.2—Implement prevention activities (**Appendix A**, Best Management Practices for Weed Prevention) as part of field activities to avoid contributing to spread of invasive plants from BLM actions.
	Action VW-1.2.3—Implement invasive plant control methods including, but not limited to, physical, mechanical, biological, and chemical control.
	Action VW-1.2.4—Rehabilitate treated areas to provide competitive plant communities and avoid establishment of invasive plant populations.

Other objectives and actions from the RMP applicable to the proposal include:

Objective VN-1.1—In perennial plant communities, maintain existing native plants and manage desirable nonnative plants for diversity, production, soil stability and nutrient cycling.

Objective VR-1.1—Strive to improve degraded riparian and wetland vegetation relative to site potential and potential natural vegetation composition and habitat diversity.

Objective WS-1.6—Manage rangeland and forest vegetation habitats to provide for diversity, cover, structure, forage, and security to contribute to healthy populations of rangeland and forest dependent species and other wildlife.

Action WS-1.6.2—Strive to maintain or improve ecological condition status of native grassland plant communities. Priority areas will include important winter and spring range areas for bighorn sheep, elk, and deer. Emphasis management areas will include the Craig Mountain WMA and Rattlesnake Ridge areas.

Objective SP- 1.2—Support Recovery Plan actions for listed plants to contribute towards recovery and delisting.

Action SP-1.2.3—Implement control measures for invasive plants that adversely impact listed plant populations. Emphasis will occur on control of invasive plants inside listed plant populations and within 0.5-mile of the perimeter of listed plant populations.

1.7 Relationship to Statutes, Regulations or Other Plans

The proposed action is further consistent with the following federal, state and local policies and plans related to the BLM's management of weeds.

- The *Carson-Foley Act of 1968* (Public Law 90-583; 43 U.S.C. 1241 et seq.), and the *Plant Protection Act of 2000* (Public Law 106-224; 7 U.S.C. 7701 et seq.) authorize and direct the BLM to manage noxious weeds (including management of undesirable plants on federal lands) and to coordinate with other federal and state agencies in activities to eradicate, suppress, control, prevent, or retard the spread of any noxious weeds on federal lands.

- The *Federal Noxious Weed Act of 1974* (Public Law 93-629)*, as amended by Section 15, Management of Undesirable Plants on Federal Lands, 1990*, (7 U.S.C. 2801 et seq.) authorizes the Secretary "...to cooperate with other federal and state agencies and others in carrying out operations or measures to eradicate, suppress, control, prevent, or retard the spread of any noxious weed." This Act established and funded an undesirable plant management program, implemented cooperative agreements with state agencies, and established integrated management systems to control undesirable plant species.

- The *Federal Land Policy and Management Act of 1976, as amended*, (Public Law 94-579; 43 U.S.C. 1701 et seq.) directs BLM to "...take any action necessary to prevent unnecessary and or undue degradation of the public lands."

- The *Idaho Noxious Weed Law* (Title 22 Agriculture and Horticulture, Chapter 24 Noxious Weeds) specifies the list of noxious weeds in the state and requires control of these designated weeds and other pests on public and private lands.

- The *Public Rangelands Improvement Act of 1978* (Public Law 95-514; 43 U.S.C. 1901 et seq.) requires that BLM manage, maintain, and improve the condition of the public rangelands so that they become as productive as feasible.

- *BLM Manual 9011 and Manual Handbook H-9011-1: Chemical Pest Control* – Outlines policy and provides guidance for conducting pest control programs on public land.

- *BLM Manual 9014 – Use of Biological Control Agents of Pests on Public Lands* – Outlines policy, defines responsibilities, and provides guidance for the release, maintenance, and collections of biological control agents for integrated pest management (IPM) programs on the lands administered by the BLM.

- *BLM Manual 9015: Integrated Weed Management, 1992*, provides policy relating to the management and coordination of noxious weed activities among BLM, organizations, and individuals.

- *BLM Manual 9220: Integrated Pest Management* – Outlines policy, defines responsibilities, and provides guidance for implementing integrated pest management programs on the lands administered by BLM

- *Department of the Interior, Departmental Manual 609: Weed Control Program, 1995,* prescribes policy to control undesirable or noxious weeds on the lands, waters, or facilities under its jurisdiction to the extent economically practicable, as needed for resource protection and accomplishment of resource management objectives.

- *Tri-State, Joseph Plains, Salmon River, Clearwater Basin, and Upper Clearwater WMA Management Plans.* These plans identify priorities and responsibilities within each WMA and provide a means of cooperative weed control across ownership boundaries.

- *Executive Order 13112, Invasive Species, 1999,* directs federal agencies to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause.

- *Environmental Assessment for Noxious Weed Control on the Coeur d'Alene District* ID060-94-05, 1994. Provides direction for integrated noxious weed control in the Coeur d'Alene District of the BLM.

- The *Noxious Weed Control and Eradication Act of 2004* (Public Law 108–412) established a program to provide assistance through states to eligible weed management entities to control or eradicate harmful, non-native weeds on public and private lands.

- *Vegetation Treatment on BLM Lands in Thirteen Western States, ROD 1991,* decisions were made in this document to allow the use of manual, mechanical, and biological control methods on BLM lands.

- The *Final Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement, 2007,* and the *Final Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report, 2007,* analyzed the direct, indirect, and cumulative impacts to various resources from the proposed vegetation treatment project and alternatives.

- *The Clean Water Act (1987),* as amended (33 U.S.C. 1251), establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water. The Act also requires permits for point source discharges to navigable waters of the United States and the protection of wetlands and includes monitoring and research provisions for protection of ambient water quality.

- *Idaho Water Quality Regulations* implement permitting and monitoring requirements for the *National Pollutant Discharge Elimination System*, operation of injection wells, groundwater protection requirements and prevention and response requirements for spills.

- *Protection of Wetlands (EO 11990)* requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

- *Floodplain Management (EO 11988)* provides for the restoration and preservation of national and beneficial floodplain values, and enhancement of the natural and beneficial values of wetlands in carrying out programs affecting land use.

1.8 Incorporation by Reference and Tiering

Incorporation by reference and tiering provide opportunities to reduce paperwork and redundant analysis in the NEPA process, by referring to other readily available documents that cover similar issues. Tiering is a form of incorporation by reference that refers to previous EAs or EISs. This EA implements the tiering process outlined in 40 CFR 1502.20, which encourages agencies to eliminate repetitive discussions, and analyze actions at a programmatic level for those programs that are similar in nature or broad in scope (40 CFR 1502.4(c), 1502.20, and 1508.23). After a broad programmatic analysis has been prepared, any subsequent EA on an action included within the entire program or policy (particularly a site-specific action) need only summarize issues discussed in the broader statement and concentrate on the issues specific to the subsequent action.

In addition to tiering to the Proposed Cottonwood RMP and Final EIS (BLM 2008), the analyses of herbicide use in this EA are tiered to the *Final Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement, 2007* (PEIS) that was released to the public on June 29, 2007 (BLM 2007a). The PEIS was developed to guide the BLM's actions through its proposed treatment of vegetation, and specifically weeds, in 17 western states in the United States using fourteen currently approved and four new herbicide active ingredients. The decision to utilize herbicides was made in the record of decision (ROD) for the PEIS (BLM 2007c).

The 2007 PEIS assesses the use of certain herbicides to treat undesirable vegetation on public lands administered by the BLM and provides a comprehensive source of information to which subsequent environmental analyses can be tiered. The programmatic analysis in the PEIS contains broad regional descriptions of resources, provides a broad environmental impact analysis, including cumulative impacts, focuses on general policies, and provides Bureau-wide decisions on herbicide use for vegetation management. Tiering of the analysis in this EA to the PEIS allows the CFO to prepare more specific environmental documents without duplicating relevant portions of the PEIS. The PEIS is used to facilitate the analysis process by providing BLM treatment design features and providing impact assessment data for herbicides.

In addition, a programmatic environmental report (PER) was developed that included information on the use of prescribed fire and manual, mechanical, and biological treatment methods to control vegetation (BLM 2007b). The general effects on the environment from using non-herbicide treatment methods, including fire use, mechanical, manual, and biological control methods, to treat hazardous fuels, invasive species, and other unwanted or competing vegetation are disclosed in the PER (BLM 2007b). Decisions were made in the Idaho ROD (BLM 1991b) for the Thirteen Western States Vegetation Treatment EIS (BLM 1991) to implement biological and manual control on BLM lands.

2 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the BLM's Proposed Action and four alternatives for the Cottonwood Field Office integrated weed treatment program:

Section 2.1 Elements Common to All Alternatives
Section 2.2 Proposed Action (including use ten active ingredient in herbicide treaments)
Section 2.3 Alternative 1 -- 18 Active Ingredient List
Section 2.4 Alternative 2 – No Aerial Application
Section 2.5 Alternative 3 – No Herbicide or Exotic Biological Control
Section 2.6 Alternative 4 – No Action

The Proposed Action is to use available biological, chemical and manual control methods, and the chemical herbicide treatments would include use of ten active ingredients. Alternatives that were considered but eliminated from detailed analysis in chapter 3 (Affected Environment) and chapter 4 (Environment Effects) of this EA are discussed in section 2.7. This chapter concludes with a summary comparison of treatments and the active ingredients proposed for use by the alternatives.

2.1 Elements Common to All Action Alternatives

The following general elements would apply to all of the alternatives analyzed in detail in this EA. The BLM has been mandated under a variety of statutes and policy initiatives to address noxious and invasive weeds mainly out of concern for the effect these species have on native plant community health. The 2007 PEIS ROD identifies the following weed management priorities as taken from the BLM's *Partners Against Weeds: An Action Plan for the BLM*, 1996.

- Priority 1: Take actions to prevent or minimize the need for vegetation control when and where feasible, considering the management objectives of the site.
- Priority 2: Use effective non-chemical methods of vegetation control when and where feasible.
- Priority 3: Use herbicides after considering the effectiveness of all potential methods or in combination with other methods or controls.

It is important to recognize that the lands managed by the CFO are often scattered parcels intermingled with other federal, state, tribal and private lands. Development and implementation of an effective weed management strategy is only possible through the participation and support of cooperators in the locally organized WMAs. All alternatives employ an integrated approach to stop weed spread consisting of six generally recognized components which are also addressed in the Cottonwood RMP. The CFO, in coordination with local WMAs, implements these components through cooperative efforts.

1. Prevention - Keep weed-free areas weed-free. Prevention is the most biologically sound and cost effective approach to avoid invasive species impacts. Prevention, although an IPM component, is not a treatment method once invasive species are established. The majority of the native plant communities in the CFO are currently in mid-seral to excellent ecological condition. Once an area has been taken over by weeds, returning the

site to desirable vegetation is expensive and difficult if not impossible to achieve. All alternatives adopt prevention measures include in the ROD for the PEIS (BLM 2007c) (pgs. B-3 and B-4) which may be implemented as appropriate to help prevent the introduction and spread of invasive weed species. Managers may also prescribe or develop additional measures to prevent weed introduction and spread. Some examples of these types of actions include changes in livestock grazing management, road closures, and closures of trails or parking areas. These prevention practices are considered as individual projects are planned, developed, and analyzed through the NEPA process and implemented.

2. Inventory – Effective strategies for control of invasive species cannot be developed without a complete understanding of the existing weed situation. Inventory and mapping efforts are conducted periodically in each WMA across all ownerships. This information is utilized to develop management strategies for each weed species and also to assist in monitoring the effectiveness of those strategies.

3. Education – Education activities include both efforts with the general public (external) and within the weed management community and CFO (internal). External education efforts include such things as providing information on the impact of weeds and teaching weed identification and components of IWM. Internal education efforts include such things as training on proper application of herbicides, monitoring techniques, weed identification, and providing information specific to the implementation of various components of IWM.

4. Control – A variety of control methods are available for use. The only control treatment common to all alternatives is manual control. Manual treatments physically destroy, disrupt growth, or interfere with the reproduction of noxious and invasive species. Manual treatments may be hand pulling or involve the use of hand tools and hand-operated power tools to cut, clear, or prune herbaceous and woody species. Treatments include cutting undesired plants above the ground level; pulling, grubbing, or digging out root systems of undesired plants to prevent sprouting and regrowth; cutting at the ground level or removing competing plants around desired species; or placing mulch around desired vegetation to limit competitive growth (BLM 1991). This type of treatment would typically be used on small isolated infestations, around sensitive plant locations, or in areas where chemical or biological control is not practical or is restricted.

5. Monitoring - Monitoring is required to help determine if management actions are achieving our goals of reducing and eradicating noxious weeds. Included in monitoring are records of herbicide application, biocontrol release, post herbicide treatment monitoring, and monitoring of biocontrol releases. Every herbicide application and biocontrol release made in CFO is documented by the appropriate record. Post treatment monitoring is accomplished on approximately ninety percent of all herbicide applications. In some instances post treatment monitoring is not accomplished on remote or inaccessible treatment sites. It is estimated that post biocontrol release monitoring has been accomplished at ninety percent of all release sites.

6. Revegetation – Areas where invasive species have replaced the desired plant community are good candidates for revegetation treatments. Revegetation can also be used on small areas of soil disturbance or weed treatment to prevent weed establishment. This IWM technique breaks the cycle of continuous weed invasion by establishment of a desirable, competitive plant community. Once established, these communities can more readily resist invasive weed establishment. In some circumstances CFO may take advantage of weed control activities or disturbance factors to broadcast seed over limited areas and cover with weed free mulch material. This revegetation would occur over small sized areas and would not be likely to total over two acres per year. Larger planned projects for revegetation would be covered under additional site specific NEPA analysis.

The first three components are not specific on-the-ground actions but tools. Prevention is considered in project planning. Education activities are implemented both internally in BLM and externally with cooperators on a variety of invasive species topics. Many external education efforts are conducted as part of yearly WMA activities. Inventory is conducted mainly through cooperative efforts across boundaries in WMAs. Education and inventory are also completed as as projects are planned. As required by *Executive Order 13112;* NEPA analyses for projects consider what impact, if any, a proposed action will have on weed introduction and spread. Revegetation projects are conducted by the CFO on a project specific basis with individual NEPA analysis. Control, along with monitoring, is the specific action for which alternative treatment options are described and analyzed in this NEPA document.

2.2 Proposed Action

Use available biological, chemical and manual control methods to treat weeds as part of an integrated weed management program in the CFO. There are currently forty-seven weed control sites in the CFO. Appendix 1 – *Cottonwood Weed Control Sites* details the general location and descriptions of the current sites. Individual maps of these sites are available on request.

Sixty-four plants are listed as noxious in the state of Idaho by the Idaho State Department of Agriculture (ISDA 2011). The extent of the noxious weed situation in the CFO requires prioritization of weed treatment efforts for the most efficient use of limited time and resources.

<u>Priority I</u> - <u>Potential New Invaders</u> - Also known as early detection, priority would be given to education and awareness activities so employees and cooperators would be able to recognize a new invasive species. Inventory activities are also important to detect potential new invaders.

<u>Priority II</u> - <u>New Invaders</u> – Once inventory detects a new invader, **rapid treatment response** is implemented. The goal of this control action is eradication of the invasive species. If the weed population is too large for an eradication response, **control** of the population to keep the weed from spreading becomes the goal.

<u>Priority III</u> - <u>Established Infestations</u> - **Containment** and prevention of further spread is the goal for established infestations of weeds. These weed populations are widespread and not economically feasible to control.

The proposed action includes the treatment of the following noxious weeds and other plants considered invasive, in accordance with CFO priorities.

Idaho Early Detection Rapid Response Action Weeds

Brazilian Elodea (*Egeria densa*)
Common frogbit *(Hydrocharis morsus-ranae)*
Fanwort *(Cobomba caroliniana)*
Feathered mosquito fern *(Azolla pinnata)*
Giant hogweed (*Heracleum mantegazzianum*)
Giant salvinia (*Salvinia molesta)*
Hydrilla (*Hydrilla verticillata*)
Policeman's helmet (*Impatiens glandulifera*)
Squarrose knapweed (*Centaurea triumfetti*)
Syrian beancaper (*Zygophyllum fabago*)
Tall hawkweed (*Hieracium piloselloides*)
Variable-leaf milfoil *(Myriophyllum heterophyllum)*
Water chestnut *(Trapa natans)*
Yellow devil hawkweed (*Hieracium glomeratum)*
Yellow floating heart *(Nymphoides peltata)*

Idaho Control Action Weeds

Black henbane (*Hyoscyamus niger*)
Bohemian knotweed (*Polygonum bohemicum*)
Buffalobur (*Solanum rostratum*)
Common crupina (*Crupina vulgaris*)
Common reed *(Phragmites australis)*
Dyer's woad (*Isatis tinctoria*)
Eurasian watermilfoil (*Myriophyllum spicatum*)
Giant knotweed (*Polygonum sachalinense*)
Japanese knotweed (*Polygonum cuspidatum*)
Johnsongrass (*Sorghum halepense*)
Matgrass (*Nardus stricta*)
Meadow knapweed (*Centaurea debeauxii*)
Mediterranean sage (*Salvia aethiopis*)
Musk thistle (*Carduus nutans*)
Orange hawkweed (*Hieracium aurantiacum*)
Parrotfeather milfoil (*Myriophyllum aquaticum*)
Perennial sowthistle (*Sonchus arvensis*)
Russian knapweed (*Acroptilon repens*)
Scotch broom (*Cytisus scoparius*)
Small bugloss (*Anchusa arvensis)*
Vipers bugloss *(Echium vulgare)*
Yellow hawkweed *(Hieracium caespitosum)*

Idaho Contain Action Weeds

Canada thistle (*Cirsium arvense*)
Curlyleaf pondweed *(Potamogeton crispus)*
Dalmatian toadflax (*Linaria dalmatica* ssp. *dalmatica*)
Diffuse knapweed (*Centaurea diffusa*)
Field bindweed (*Convolvulus arvensis*)
Flowering rush *(Butomus umbellatus)*
Hoary alyssum (*Berteroa incana*)
Houndstongue (*Cynoglossum officinale*)
Jointed goatgrass (*Aegilops cylindrica*)
Leafy spurge (*Euphorbia esula*)
Milium (*Milium vernale*)
Oxeye daisy (L*eucanthemum vulgare*)
Perennial pepperweed (*Lepidium latifolium*)
Plumeless thistle (*Carduus acanthoides*)
Poison hemlock (*Conium maculatum*)
Puncturevine (*Tribulus terrestris*)
Purple loosestrife (*Lythrum salicaria*)
Rush skeletonweed (*Chondrilla juncea*)
Saltcedar (*Tamarix* sp.)
Scotch thistle (*Onopordum acanthium*)
Spotted knapweed (*Centaurea stoebe*)
Tansy ragwort (*Senecio jacobaea*)
White bryony (*Bryonia alba*)
Whitetop (*Cardaria draba*)
Yellow flag iris *(Iris pseudacorus)*
Yellow starthistle (*Centaurea solstitialis*)
Yellow Toadflax (*Linaria vulgaris*)

Additional Invasive Species CFO May Target for Treatment

Russian olive (*Elaeagnus angustifolia*)
Himalayan blackberry *(Rubus armeniacus)*
Tree of Heaven (*Ailanthus altissima*)
White mulberry (*Morus alba*)
North Africa grass *(Ventenata dubia)*
Longspine sandbur (*Cenchrus longispinus*)
Burdock *(Arctium minus)*
Medusa-head rye *(Taeniatherum caput-medusae)*
St. Johnswort (*Hypericum perforatum)*Sulphur cinquefoil (*Potentilla recta)*
Indigo bush (*Amorpha fruticosa)*
Siberian elm (*Ulmus pumila)*
Bouncing bet (*Saponaria officinalis)*
Buckthorn (*Rhamnus spp.)*
Downy brome (*Bromus tectorum*) and other exotic annual bromes

Weed control treatments would occur within sensitive areas including: riparian conservation areas (RCA); drainages providing aquatic habitat for Endangered Species Act (ESA) – listed fish; and in proximity to ESA-listed threatened plants. In proximity to these sensitive resources, treatments would use buffers, SOPs, project criteria, and updated design measures agreed upon during Section 7 consultation with the National Marine Fisheries Service (NMFS) and Fish and Wildlife Service (FWS). As new weed infestations are found they may be treated as long as the treatment incorporates the SOPs, mitigation measures and design features included in this EA and current Section 7 ESA consultation with NMFS and FWS.

Chemical Treatments

Sensitive plant clearances and archeological clearances will be conducted prior to implementing any herbicide project. Herbicide use would be in accordance with the ROD for *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States PEIS*.

The following ten active ingredients (AIs) would be included for use in this alternative: 2, 4-D, chlorsulfuron, clopyralid, dicamba, glyphosate, imazapic, imazapyr, metsulfuron methyl, picloram, and sulfometuron methyl. These herbicide AIs include the ones currently being utilized by the CFO and imazapyr which would be effective against invasive species we either have or expect to be finding in the near future. The herbicides would be applied either aerially or by ground in a water diluent with no one treatment area more than 200 acres. In most cases, treatments would be ground based spot treatments of a few plants or small infestations of less than one acre. Ground based broadcast treatment may occur to treat weed patches along roadsides or off-road on areas accessible by all-terrain vehicle (ATV) or pickup. Total acres of chemical vegetation treatments under this proposed action would not exceed 800 acres per year. This is six tenths of one percent (0.6%) of the 132,526 acres of public lands managed by the CFO. In relation to the 8.8 million acres within the field office (FO) area, potential herbicide treatment is being proposed by BLM on one, one-hundredth of one percent (0.01%) of the CFO area. Most herbicides proposed for use are selective, meaning they target specific groups of plants such as broadleaves or perhaps plants in the sunflower or legume family. This selectivity can be further enhanced or decreased through the selection of product use rate. Larger areas of treatment, approaching the 200 acre size, would be accomplished utilizing selective herbicides. This means treatment areas would still have vegetative cover and not result in bare ground. The exception to this would be in the case of herbicide use for revegetation where treatment would target non-native annual grasses and forbs. These treatments would utilize imazapic or glyphosate and would be covered under separate NEPA documentation with herbicide use tiered to this document.

Selection of an herbicide for site-specific application would depend on its effectiveness on a particular weed species, habitat types present, proximity to water, and presence or absence of sensitive plant, wildlife, and fish species. Only trade name herbicides or adjuvants which have been approved for use on BLM lands may be utilized. All herbicides are registered with the Environmental Protection Agency (EPA) before they are available for use.

Table 2-1 details the ten herbicide AIs and their trade names commonly used by the CFO, and for what purpose the herbicide is typically used. Information was summarized from the PEIS, Table 2-3 and pages 4-48 thru 4-62. Trade names displayed in the table are provided for informational purposes only. Their identification does not preclude the use of additional trade names approved for use by BLM or infer preference for the listed products.

Table 2-1. Proposed Action Herbicide Information

Active Ingredient (AI)	Trade Names Used by CFO	Herbicide Description and Typical Use in the Cottonwood Field Office
Chlorsulfuron	Telar DF, Telar XP	A selective herbicide used on perennial broadleaf weeds and grasses. It can be applied both pre and post-emergence inhibiting seed germination and killing established plants. It has been typically used to control puncturevine and whitetop in spot spray applications. It may also be employed for control of perennial pepperweed, biennial thistles, dalmation toadflax, oxeye daisy and yellow starthistle.
Clopyralid	Stinger, Transline, Clopyralid 3	A selective herbicide most effectively used post-emergent for the control of broadleaf weeds. Typically used to control knapweeds, yellow starthistle, Canada thistle and Scotch thistle. Most shrubs and trees are tolerant of this AI so it is chosen for ground based applications around trees and shrubs. AI works well until the target species bolt and begin to flower. After this stage AI is not effective and other herbicides must be used.
2,4-D	2,4-D Amine 4, Weedestroy AM-40, Weedar 64, 2,4-D Amine 4, Formula 40	2,4-D is a plant growth regulator and acts as a synthetic auxin hormone. Broad-leaf plants are more susceptible and narrow-leaf plants like grasses or lily species are not generally impacted by labeled rates. This post emergent herbicide is applied alone and in tank mixes for general control of broadleaves. AI is effective in providing quicker cession of plant function so we often switch to this from clopyralid when the weed targets are in bolting or bloom stage in order to prevent seed production. Some formulations of this AI are approved for aquatic application.
Dicamba	Dicamba DMA, Clarity, Banvel,	A growth-regulating herbicide effective for control of annual and perennial broadleaf weeds, brush and trees. Herbicide AI is typically a component of a mix with 2,4-D or picloram to increase effective control of dalmation toadflax or whitetop.
Glyphosate	Rodeo, GlyphoMate 41, Glyphosate 4, Accord Concentrate, Credit Extra	A non-selective systemic herbicide that can damage all groups or families of plants to varying degrees. It has low residual activity. AI is broadcast in revegetation projects for site preparation to kill competing vegetation. Spot treatment applications are made for problem weeds. Formulations of this product are available for aquatic use and these are used for spot treatment of weeds in riparian areas and next to water.

Active Ingredient (AI)	Trade Names Used by CFO	Herbicide Description and Typical Use in the Cottonwood Field Office
Imazapic	Plateau; Panoramic 2SL;	This is a selective, systemic herbicide that can be applied both pre-emergence and post-emergence for the management of selected broadleaf and grassy plant species. It is broadcast applied at low rates for site preparation in revegetation projects to control annual grasses. Spot application is made at higher rates to control leafy spurge. It may also be used to control houndstongue, whitetop and perennial pepperweed.
Imazapyr	Habitat	A herbicide used in the control of a variety of grasses, broadleaf weeds, vines and brush species. Habitat is an aquatically approved formulation. AI not used yet in CFO but may be employed as a tool to control salt cedar, Russian olive, Japanese knotweed or purple loosestrife.
Metsulfuron methyl	Escort XP, MSM 60, Escort DF, MSM E-Pro 60 EG Herbicide	Metsulfuron methyl is a selective pre and post emergent herbicide used in the control of many annual and perennial weeds and woody plants. AI has been used to control whitetop and other mustards as well as houndstongue, sulfur cinquefoil and mullein. The AI can also be effective on other broadleaves such as yellow starthistle, blackberry, purple loosestrife, oxeye daisy, dalmation toadflax, etc.
Picloram	Tordon 22K, OutPost 22K	Controls susceptible broadleaf weeds, woody plants and vines. Provides residual control in projects reducing the need for annual retreatment. The residual activity typically allows control for up to two summers at the rates utilized in the FO. Used in aerial treatments in remote areas. Often tank mixed in ground based applications for residual control in non-sensitive areas. Not applied within 100 feet of live water in the FO. AI is not applied within 25 feet of sensitive plants.
Sulfometuron Methyl	Oust DF	Broad-spectrum herbicide with pre-emergence and post-emergence activity. It is phytotoxic at very low rates. Used to target broadleaf weeds and annual and perennial grass species.

The use of sulfometuron methyl is currently not allowed on public lands managed by the BLM in Idaho per direction issued by the Idaho State Director. Should this direction be reversed, CFO would again consider the use of AI. If additional active ingredients become available for use on public lands through the risk assessment process delineated in the 2007 PEIS ROD, the CFO would consider the use of those products.

This EA adopts the standard operating procedures (SOPs) and mitigation measures delineated in the 2007 PEIS ROD (BLM 2007c). SOPs are in Table B-2 on page B-9 thru B-14. Mitigation measures are in Table 2, page 2-4 thru 2-6. All herbicides would be applied in adherence to the herbicide product label.

In addition to the adoption of the SOP and mitigation measures from the PEIS ROD, the CFO includes the following design features as a part of the Proposed Action:

- A spill cleanup kit will be immediately accessible when herbicides are stored or transported and individuals involved in herbicide handling or application will be familiar with how to utilize the spill kit and implement the CFO spill contingency plan.

- Equipment used for transportation, storage, or application of herbicides shall be maintained to prevent leaks.

- Only the quantity of herbicides needed for the day's application will be transported from the storage area.

- Within fifteen feet from live water only herbicides approved for aquatic use such as aquatically approved formulations of glyphosate or imazapyr will be used.

- Within 100 feet of live water, only spot spraying of target plants may occur. (No broadcast treatment will occur)

- No picloram may be applied within 100 feet of live waters.

- No aerial application will take place within the following buffers:
    - 300 feet – fish bearing waters
    - 200 feet – perennial, non-fish bearing waters
    - 200 feet – intermittent stream channels with live water
    - 100 feet – intermittent stream channels that are dry

- Avoid application of picloram within dry ephemeral stream channels or roadside ditches that drain directly into fish bearing streams.

- Only hand control measures will be implemented within two feet of a listed plant.

- From two to twenty-five feet away from a listed plant, only ground based selective spot treatment may occur utilizing a packpack, handpump, or wipe applicator and no picloram use will be authorized.

- No broadcast application is allowed within fifty feet of a listed plant.

- No aerial application is allowed within 300 feet of the outer perimeter of a listed plant population.

Spray solution adjuvants approved for use on public lands managed by the BLM would be utilized with herbicides. Adjuvants are any product added to the herbicide solution to improve the performance of the spray mixture and include drift retardants, suspension aids, surfactants and spray buffers. Marker dyes would commonly be utilized for more precise herbicide application during spraying operations. Due to concerns about the potential impacts of surfactants in aquatic environments the CFO will utilize adjuvants such as Agri-Dex™, LI-700™, Kinetic™, and Competitor™ which are all listed as approved for use in aquatic environments by the Washington State Department of Ecology and approved for use by BLM.

Equipment used to apply herbicides would include helicopters, vehicle mounted spray tanks, ATV or UTV mounted spray tanks, backpack sprayers, horse pack sprayers, wick wipers, hand sprayers and low volume sprayers. Analysis of herbicide treatment acres accomplished in the CFO indicates that in average years approximately fifty percent of yearly herbicide treatment acres are accomplished through aerial methods and fifty percent are accomplished through ground based methods.

Manual and Biological Control

The use of non-herbicide control methods is discussed in the *Vegetation Treatments, PER*. Biological and manual control methods for invasive plants, described in the PER and approved for use on BLM lands in the Idaho ROD for the Thirteen States EIS 1991, are incorporated into this Proposed Action. Approximately three to five acres of manual control has been accomplished each year in the CFO through hand pulling, hoeing, chopping and the use of hand held spin trimmers. It is estimated that between three and ten acres of manual control would be accomplished per year under this Proposed Action alternative. Sheep or goat grazing is not proposed as a biological control component for invasive species in this EA. Specific weed control projects involving these animals may be undertaken and would be analyzed separately.

Biological control involves the intentional use of domestic animals, insects, nematodes, mites, or pathogens (agents such as bacteria or fungus that can cause diseases in plants) that weaken or destroy vegetation (BLM 1991). The concept of biological control is to introduce natural enemies that are specific to particular weeds and which would not attack other plants. The use of biological agents is strictly controlled and permitted by the United States Department of Agriculture (USDA) - Animal and Plant Health Inspection Service (APHIS) following rigorous testing to ensure that agents are host-specific. The goal of biological control is to reduce the weed to a minor part of the vegetation community instead of the dominant member of the community. Biological control will not eradicate a weed species and is not appropriate to be used when eradication of a weed is the management goal.

Biological control agents have been utilized in the CFO weed control program since the first biological control insect, the yellow starthistle bud weevil *Bangasternus orientalis* became available in 1986. Under the proposed action, currently approved biological control agents would be released as necessary for weeds such as spotted knapweed, leafy spurge, Dalmatian toadflax, rush skeletonweed, diffuse knapweed, and yellow starthistle. As new agents are approved for release, they would also be considered as a control method for these weeds. If additional weeds become established in the FO for which approved agents are available those agents will also be considered as a treatment tool if their use would help to achieve treatment goals. It is estimated that between five and twenty agent releases may be made per year under this analysis. Table 2-2 details the biological control agents currently approved for use in Idaho.

Table 2-2. Biological Control Agents

Weed Target	Biological Control Agent(s)
Dalmatian toadflax (*Linaria dalmatica* ssp. *dalmatica*) Yellow toadflax (*Linaria vulgaris*)	Toadflax flower-feeding beetle *(Brachypterolus pulicarius)* Toadflax moth *(Calophasia lunula)* Toadflax root-boring moth *(Eteobalea intermediella)* Toadflax root-boring moth *(Eteobalea serratella)* Toadflax stem weevil *(Mecinus janthinus)* Toadflax capsule weevil *(Rhinusa antirrhini)* Toadflax root galling weevil *(Rhinusa linariae)*
Canada thistle (*Cirsium arvense*):	Canada thistle stem weevil (*Ceutorhynchus litura)* Canada thistle gall fly *(Urophora cardui)*

Weed Target	Biological Control Agent(s)
Diffuse knapweed (*Centaurea diffusa)* Spotted knapweed (*Centaurea stoebe*) Russian knapweed *(Acroptilon repens)*	Yellow-winged knapweed root moth (*Agapeta zoegana)* Russian knapweed gall wasp *(Aulacidea acroptilonica)* Broad-nosed seed head weevil *(Bangasternus fausti)* Knapweed peacock fly (*Chaetorellia acrolophi)* Knapweed root weevil *(Cyphocleonus achates)* Russian knapweed gall midge (*Jaapiella ivannikovi)* Lesser knapweed flower weevil (*Larinus minutus)* Blunt knapweed flower weevil *(Larinus obtusus)* Spotted knapweed seed head moth (*Metzneria paucipunctella)* Brown-winged root moth *(Pelochrista medullana)* Grey-winged root moth *(Pterolonche inspersa)* Bronze knapweed root-borer *(Sphenoptera jugoslavica)* Russian knapweed stem gall nematode *(Subanguina picridis)* Green clearwing fly *(Terellia virens)* Banded gall fly *(Urophora affinis)* UV knapweed seed head fly *(Urophora quadrifasciata)*
Field bindweed (*Convolvulus arvensis)*	Aceria malherbae *(Aceria malherbae)* Bindweed moth *(Tyta luctuosa)*
Leafy spurge *(Euphorbia esula)*	Minute spurge flea beetle *(Aphthona abdominalis)* Brown dot leafy spurge flea beetle *(Aphthona cyparissiae)* Black leafy spurge flea beetle*(Aphthona czwalinae)* Copper leafy spurge flea beetle*(Aphthona flava)* Brown-legged leafy spurge flea beetle *(Aphthona lacertosa)* Black dot leafy spurge flea beetle *(Aphthona nigriscutis)* Hungarian clearwing moth *(Chamaesphecia hungarica)* Leafy spurge hawkmoth *(Hyles euphorbiae)* Red-headed leafy spurge stem borer *(Oberea erythrocephala)* Leafy spurge tip gall midge *(Spurgia esulae)*
Mediterranean sage *(Salvia aethiopis)*	Mediterranean sage weevil *(Phrydiuchus tau)*
Puncturevine (*Tribulus terrestris*)	Puncturevine seed weevil *(Microlarinus lareynii)* Puncturevine stem weevil *(Microlarinus lypriformis)*
Purple loosestrife (*Lythrum salicaria*):	Black-margined loosestrife beetle *(Galerucella calmariensis)* Golden loosestrife beetle *(Galerucella pusilla)* Loosestrife root weevil *(Hylobius transversovittatus)* Blunt loosestrife seed weevil *(Nanophyes brevis)* Loosestrife seed weevil *(Nanophyes marmoratus)*
Rush skeletonweed (*Chondrilla juncea*):	Skeletonweed root moth *(Bradyrrhoa gilveolella)* Skeletonweed gall midge *(Cystiphora schmidti)* Skeletonweed gall mite *(Eriophyes chondrillae)* Rush skeletonweed rust*(Puccinia chondrillina)*
St. Johnswort *(Hypericum perforatum)*	St. Johnswort borer (*Agrilus hyperici)* St. Johnswort inchworm *(Aplocera plagiata)* Klamath weed beetle *(Chrysolina hyperici)* Klamath weed beetle *(Chrysolina quadrigemina)*
Yellow starthistle (*Centaurea solstitialis*):	Yellow starthistle bud weevil *(Bangasternus orientalis)* Yellow starthistle hairy weevil *(Eustenopus villosus)* Yellow starthistle flower weevil *(Larinus curtus)* Yellow starthistle peacock fly *(Chaetorellia australis)* Yellow starthistle gall fly *(Urophora sirunaseva)*

Accessed 2/2/2011 from the Idaho Department of Agriculture website and modified by known availability by Lynn Danly
http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/Bio_Control.php

2.3 Alternative 1 – 18 Active Ingredient List

All design features are the same as the Proposed Action except Alternative 1 adopts the use of all 18 herbicide AIs listed under the Preferred Alternative of the 2007 PEIS. The herbicide active ingredients include: 2, 4-D, bromacil, chlorsulfuron, clopyralid, dicamba, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, triclopyr, imazapic, diquat, diflufenzopyr (in formulation with dicamba), and fluridone. Estimated yearly herbicide treatment acreage would be the same as the Proposed Action. Biological control and manual control would also be the same.

Table 2-4 describes the additional herbicide active ingredients that were not already proposed for use in Table 2-1 for the Proposed Action alternative. Trade names displayed in the table are provided for informational purposes only. Their identification does not preclude the use of additional trade names approved for use by BLM or infer preference for the listed products.

Table 2-3. Additional Herbicides Proposed for Use in Alternative 1

Active Ingredient	Trade Names	General Effects to Vegetation
Bromacil	Hyvar X; Hyvar XL; Bromacil 80DF	Bromacil is a non-selective, "broad spectrum" systemic herbicide, which is most effective against annual and perennial weeds, brush, woody plants, and vines. Poses high risk to non-target species in the immediate area of treatment.
Diflufenzopyr	This active ingredient is approved as a formulation with Dicamba and is labeled as Distinct® and Overdrive®, but cannot be used as a stand-alone active ingredient by the BLM until it is registered with the EPA.	Diflufenzopyr, which is used in combination with dicamba for weed control, is a post-emergent herbicide that inhibits the transport of auxin in the plant resulting in an abnormal accumulation of auxin or auxin-like compounds in the growing points of susceptible plants and an imbalance in growth hormones in the plant. Works well on broadleaf weeds.
Diquat	Reward	Diquat is a post-emergence, nonselective herbicide that can be applied directly to vegetation or to ponds, lakes, or drainage ditches for the management of aquatic weed species.
Diuron	Diuron 80DF; Karmex DF; Direx 80DF; Direx 4L; Diuron-DF; Diuron 80WDG; Karmex XP; Karmex IWC; Diuron 4L; Diuron 80 WDG; Vegetation Man. Diuron 80 DF	Diuron is a non-selective, broad-spectrum herbicide, effective both pre- and post-emergence.
Fluridone	Avast!; Sonar AS; Sonar Precision Release; Sonar Q; Sonar SRP	Fluridone is a systemic, selective, aquatic herbicide that can be applied to the water surface or subsurface, or as a bottom application just above the floor of the water body.
Hexazinone	Velpar ULW; Velpar L; Velpar DF; Pronone MG; Pronone 10G; Pronone 25G	A foliar or soil applied herbicide with soil activity. It is used for broadleaf weed, brush, and grass control in non-cropland and in forest lands.

Active Ingredient	Trade Names	General Effects to Vegetation
Tebuthiuron	Spike 20P; Spike 80DF; SpraKil S-5 Granules	A soil-applied herbicide used for control of woody plants and vegetation. Tebuthiuron has a two to four year residual on dry sites depending on application rates.
Triclopyr	Garlon 3A; Garlon 4; Remedy; Pathfinder II; Tahoe 3A; Triclopyr 4EC; Triclopyr 3; Triclopyr 4; Element 3A; Element 4; Forestry Garlon XRT; Garlon 4 Ultra; Remedy Ultra; Renovate 3; Renovate OTF; Ecotriclopyr 3 SL; Triclopyr 3 SL	A growth-regulating herbicide for control of woody and broadleaf perennial weeds in non-cropland, forest lands, and lawns.

2.4 Alternative 2 – No Aerial Application

All design features are the same as the Proposed Action except aerial methods would not be utilized to apply herbicides under Alternative 2. Based upon a review of application records over the past eight years, herbicides are applied on approximately one-half of the yearly treated acreage via aerial methods. It is not realistic, with the topography and difficulty of access to lands managed in the CFO, to assume more acres would be treated by non-aerial methods. Therefore, no more than 400 acres per year would be treated with herbicides under this alternative. Remote or inaccessible weed treatment sites are likely those which would not be treated. Biological control and manual control would be the same as the Proposed Action.

2.5 Alternative 3 – No Herbicide or Exotic Biological Control

This alternative was requested by public scoping. The only control methods which would be utilized in this alternative are manual and mechanical control. Approximately three to five acres of manual control has been accomplished each year in the CFO through hand pulling, hoeing, chopping and the use of hand held spin trimmers. Mechanical treatments involve the use of vehicles such as wheeled tractors, crawler-type tractors, or specially designed vehicles with attached implements designed to cut, uproot, or chop existing vegetation. Mechanical methods that may be used by the BLM include but are not limited to: tilling, drill seeding, mowing, and grubbing. Mechanical control has not been proposed under other alternatives in this EA due to limited opportunity for use. Most public land in the CFO where noxious weeds occur is steep and beyond the capability of mechanical equipment. If some acreage historically treated through herbicides could be converted to mechanical or manual treatment, it is estimated that a maximum of sixty acres would be treated per year under this alternative (ten acres manual treatment and fifty acres mechanical treatment). The significantly reduced acreage in comparison to the Proposed Action and other alternatives is also a result of financial factors. Manual and mechanical treatments are much more expensive per acre than herbicides or biological control particularly in the topography found in the CFO. Manual treatments range from $70-700 per acre (PEIS). Mechanical vegetation control costs from $100-$600 per acre. In the type of terrain found in the CFO and the types of weed species being targeted, manual and mechanical treatments would tend to be toward the higher end of the ranges. Herbicide treatment costs in the CFO range from approximately $20 to $100/acre. It is expected that funding would continue at the same levels. Therefore, it is not anticipated that additional treatment acreage would be achieved over what is estimated.

2.6 Alternative 4 – No Action

The No Action alternative would continue herbicide use and other treatment methods presently authorized for the CFO as modified by the current "Herbicides approved for use on BLM Lands" list. Under this alternative, the BLM would be able to continue use of the active ingredients previously approved under the *Final EIS for Vegetation Treatments on BLM Lands in Thirteen Western States* (BLM 1991) except atrazine, mefluidide and simazine which are no longer on the "approved list". Active ingredients in this alternative include; bromacil, chlorsulfuron, clopyralid, 2, 4-D, dicamba, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr. Aerial application of herbicides would be allowed as well as manual and biological control methods. Treatment acres for this alternative would be the same as for the Proposed Action. Protocol for the use of sulfometuron methyl would be the same as in the Proposed Action.

2.7 Alternatives Considered but not Analyzed in Detail

Use of Prescribed Fire for Weed Control – Prescribed fire is utilized in the CFO for specific vegetation treatment objectives. The interdisciplinary team (IDT) working on this project did not propose prescribed fire as a treatment method for invasive species because it is not generally effective against the species found here. Most of the invasive species which may be targets for treatment, and most current treatment sites, occur in the canyon grasslands. In most treatment areas, cheatgrass (also known as downy brome), a non-native annual brome, and numerous other species of exotic annual bromes are a component of the plant community. These species are typically promoted by fire so wide scale use of prescribed fire is not a tool of choice in these areas. Prescribed fire may be utilized as a site preparation technique for revegetation projects but these projects will be completed under separate NEPA analysis.

No Treatment - This alternative would eliminate control of any weeds on public lands within the CFO other than by the bio-control insects that have already been released. As weeds continue to invade and establish, the number and cover of native species would be reduced, erosion rates would increase, wildlife forage and bird habitat would be reduced, ecological processes (such as fire behavior) would be altered, and rare plants and habitats threatened. If not controlled, noxious weeds and other invasive exotic species, such as cheatgrass, would have great effects on ecosystem structure and function and the future productivity of the land would be compromised. Because this alternative promotes a perpetual decline in ecosystem health, it is not considered to be reasonable. It is also in conflict with the 1974 Federal Noxious Weed Law, The Federal Land Policy and Management Act of 1976, the Idaho Noxious Weed Law (Title 22, Chapter 24, Idaho Code), and the 1999 Executive Order on Invasive Species.

Weed Control through Grazing Animals – Properly implemented as a control method**,** using domestic grazing animals to stress target weeds is an effective tool. The use of goats or domestic sheep has been effective against many of the weed species found in the CFO and may be utilized for specific projects. Rocky Mountain bighorn sheep are a native wildlife species with historical range located in the CFO managed area. Due to potential disease transmission between domestic sheep and goats and bighorn resulting in reduced number of the native animals, caution is warranted. Some areas of the CFO do not coincide with bighorn sheep habitat and weed control projects using domestic grazing animals may be compatible. Should CFO, in cooperation with our CWMA partners, propose a project, separate NEPA documentation will be conducted.

2.8 Alternative Comparison

Table 2-4. Treatment Comparison by Alternative

	Proposed Action Ten Active Ingredients	**Alt. 1** Eighteen Active Ingredients	**Alt. 2** No Aerial Treatment	**Alt. 3** No Herbicide or Exotic Biological Control	**Alt. 4** No Action
Chemical					
Aerial	400	400	0	0	400
Ground	400	400	400	0	400
Manual	5	5	5	10	5
Mechanical	0	0	0	50	0
Biological Control releases	20	20	20	0	20

The potential amount of each AI used in a particular year varies due to a variety of reasons. Some years weather conditions may favor a particular weed species and therefore influence the AIs chosen for that target weed. In some cases weather conditions dictate a later field season for weed treatment promoting the use of herbicide AIs that would still be effective at later plant phenological stages. Some years, more work is done in a cooperative aerial spray project promoting the increased use of a certain AI being used in the project. Therefore, flexibility in the use of AIs is critical to a successful program.

Table 2-6 describes the AIs proposed for use in each alternative. It also portrays the typical proportion of use for each AI in the past four years.

Table 2-5. Active Ingredient Comparison by Year and Alternative

Herbicide AI	% of Total Acres Treated				Proposed Action Ten Active Ing.	Alt. 1 Eighteen Active Ing.	Alt. 2 No Aerial Treatment	Alt. 3 No Herb. or Exotic Bio. Control	Alt. 4 No Action
	2007	2008	2009	2010					
Bromacil	NU[1]					X			X
Chlorsulfuron	--[2]	--	6%	2%	X	X	X		X
Clopyralid	13%	36%	22%	2%	X	X	X		X
2,4-D	1%	8%	4%	3%	X	X	X		X
Dicamba	See Metsulfuron Methyl below				X	X	X		X
Diflufenzopyr	NU					X			
Diquat	NU					X			
Diuron	NU					X			X
Fluridone	NU					X			
Glyphosate	2%	3%	3%	<1%	X	X	X		X
Glyphosate (tank mixed with picloram for revegetation plots)	9%	--	--	<1%					
Hexazinone	U[3] used periodically in forestry applications					X			X
Imazapic (tank mixed with picloram for revegetation plots)	2%	--	--	--	X	X	X		
Imazapic	--	--	<1%	<1%					
Imazapyr	NU				X	X	X		X
Metsulfuron methyl (in combination with 2,4-D and dicamba as Cimaron Max)	7%	8%	11%	--	X	X	X		X
Metsulfuron methyl	--	--	3%	12%					
Picloram	55%	40%	26%	71%	X	X	X		X
Picloram tank mixed with 2,4-D and/or dicamba	11%	5%	25%	9%					
Sulfometuron Methyl	U - prior to 2000 in revegetation efforts.				X	X	X		X
Tebuthiuron	NU					X			X
Triclopyr	<1%	--	--	<1%		X			X
Total acreage treated	438	261	165	712*					

1 NU – not used by CFO since 1994
2 -- Active Ingredient not used that year
3 U – used by CFO since 1994, but not in 2007-2010
* - American Recovery and Reinvestment Act (ARRA) funds resulted in unusually large acreage treated in one year.

3 AFFECTED ENVIRONMENT

Chapter 3 sets the framework for understanding the baseline environment – the existing environmental resources of the area and assists the reader in understanding the analysis developed in Chapter 4 – Environmental Consequences. Following a description of the general setting of the project area, issues that are present and could be affected are carried forward for detailed analysis. The list of resource issues addressed in this chapter was developed by the IDT based on internal project review.

3.1 General Setting

The CFO boundary encompasses over 8.8 million acres in Latah, Clearwater, Nez Perce, Lewis, Idaho, and Adams Counties of north-central Idaho. The BLM administers about 1.4 percent, or 132,526 acres of lands in the planning area. The CFO manages numerous blocks of BLM land ranging in size from less than 40 acres to over 12,000 acres (BLM 2008). Other major land managers include, in descending order; Forest Service (FS), private landowners, State of Idaho, Nez Perce Tribe, and US Army Corps of Engineers.

The CFO includes a wide variety of terrain and climatic conditions. Conditions range from low elevation areas along the river corridors such as Riggins, Idaho at 1,800 feet above mean sea level to Warren, which is fairly close to the BLM's Marshal Mountain ownership at 5,920 feet above mean sea level. Annual precipitation at Riggins is 16.03 inches with temperature ranges from a mean average high of 92.2 degrees F. in July, to an average minimum low temperature of 27.7 degrees F. in January. On the opposite end of the spectrum, average annual precipitation in Warren is 24.94 inches, average maximum temperature is 77.8 degrees F. in July and the average minimum temperature is 7.0 degrees F. in January.

The Clearwater, Salmon, and Snake Rivers are the principle drainages in the CFO. The majority of BLM managed lands are located on the breaks of these rivers resulting in ownership of very steep and rocky topography. Access to BLM lands is often through adjacent private ownership and is often difficult where easements have not been secured.

3.2 Affected Resources

3.2.1 Special Designation Areas

The CFO is very diverse in vegetation and has many unique scenic, recreational, and historical values. Therefore, numerous special designation areas are present in the FO.

Areas of Critical Environmental Concern (ACEC)

An ACEC is an area where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. A RNA/ACEC is an area where natural processes are allowed to predominate and that is preserved for the primary purposes of research. Table 3-1 shows the 12 ACECs designated in the CRMP and their values.

In all ACECs, management is allowed that protects the unique values for which the designation was issued. In many cases, these values were intact or unique native vegetation. Noxious weeds are a known threat to the values for which the area was designated in all ACECs except the American River Historic Sites ACEC. In many cases, CFO is already using carefully planned noxious weed treatment to protect the integrity of the native vegetation in ACECs.

Table 3-1. Areas of Critical Environmental Concern

Name	(acres)	Attributes for which the Area Was Designated
Wapshilla Ridge RNA/ACEC	401	Supports the ecological processes associated with representative plant communities for the Tri-State Uplands Section of the Columbia Intermontane Geomorphic Province. A population of Simpson's hedgehog cactus occurs in the area.
Lower and Middle Cottonwood Islands RNA/ACEC	43	Excellent condition plant communities of ponderosa pine/bluebunch wheatgrass and coyote willow; has high values for research reference areas. The islands provide valuable nesting habitat for geese and ducks. Bald eagles use the Clearwater River corridor during the winter.
Captain John Creek RNA/ACEC	1,321	Near-pristine representative plant communities and supports the ecological processes for the Tri-State Uplands Section of the Columbia Intermontane Geomorphic Province. Provides habitat for the spring/summer chinook salmon and steelhead trout.
Long Gulch RNA/ACEC	47	MacFarlane's four-o'clock, a federally listed plant (threatened) occurs in the area.
Lucile Caves RNA/ACEC	136	Provides a unique example of a wet limestone cave environment, along with associated vegetation and vegetative communities of the Lower Salmon River drainage. Designation necessary for protection, maintenance, and enhancement of the area, as well as to provide an education, research, and reference area.
Skookumchuck RNA/ACEC	28	MacFarlane's four-o'clock, a federally listed plant (threatened), occurs in the area.
Lower Lolo Creek ACEC	3,678	High-quality wildlife, fisheries, recreation, and watershed values. This is the largest undeveloped segment of the Lolo Creek Canyon.
Upper Lolo Creek ACEC	1,625	Contains segments of the Nez Perce (Nee-Me-Poo) National Historic Trail and the Lewis and Clark National Trail. Contains high quality scenic, wildlife, fisheries, and natural values.
Lower Salmon River ACEC (Hammer Creek to confluence)	16,199	The Lower Salmon River has very high resource values for scenic, recreation, cultural, wildlife, fisheries, watershed, and other ecological values. The recreation, cultural, and fishery resource values found in this area have been identified as being nationally significant.
Upper Salmon River ACEC (White Bird Creek to French Creek)	5,759	The Upper Salmon River has very high resource values for scenic, recreation, cultural, wildlife, fisheries, watershed, and other ecological values. The recreation, cultural, and fishery resource values found in this area have been identified as being nationally significant.
East Fork American River ACEC	570	In-tact riparian and wetland areas and Engelmann spruce ecosystem. Provides habitat for Federally listed lynx, steelhead trout and bull trout.
American River Historic Sites District ACEC	6,330	Known cultural resources for this area represent virtually every known type of historic hydraulic and lode mining and are located in a small geographic area. Examples of sites include reservoirs, ditches, flumes, hydraulic mine cutbanks, dredge tailings, adits, shafts, as well as abandoned mill sites.

Wilderness and Wilderness Study Areas

Congress designated the Frank Church-River of No Return Wilderness in 1980; it totals over 2.3 million acres, 750 acres of which are located on BLM-administered lands in the Marshall Mountain area. There are currently no weed treatment activities being conducted in this area.

A wilderness study area (WSA) is an area designated by a federal land management agency as having wilderness characteristics, thus making it worthy of consideration by Congress for wilderness designation. While Congress considers whether to designate a WSA as permanent wilderness, the federal agency manages the WSA to prevent impairment of the area's suitability for wilderness designation. There are two WSAs located in the CFO and both have been recommended for not suitable for wilderness designation. The Marshal Mountain WSA is 5,571 acres. The Snowhole Rapids WSA is 6,463 acres and is located along the Lower Salmon River. Some weed control is being accomplished in the Snowhole WSA, which for the most part is also within the Lower Salmon River ACEC, primarily for spotted knapweed, dalmation toadflax, and yellow starthistle, particularly along the river corridor.

Wild and Scenic Rivers

Wild and scenic rivers are rivers or river sections designated by Congress or the Secretary of the Interior, under the authority of the Wild and Scenic Rivers Act of 1968 (Public Law 90-542, as amended; 16 United States Code 1271-2287), to protect outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values and to preserve the river or river section in its free-flowing condition. The Lower Salmon River, Long Tom Bar to the confluence of the Snake River, was designated a study river in 1968. The river was studied, was found eligible and suitable, and was recommended to Congress for inclusion in the National Wild and Scenic Rivers System as Recreational (59 miles Long Tom Bar to Hammer Creek) and Scenic (53 miles Hammer Creek to the Snake River Confluence). Congress has deliberated the issue of designation numerous times but has yet to act. Weed control actions are currently taking place along this river primarily for yellow starthistle, spotted knapweed, dalmation toadflax, and rush skeletonweed.

3.2.2 Vegetation

Invasive species

For this analysis, weeds include mostly invasive nonnative species. The BLM considers plants invasive if they have been introduced into an environment where they did not evolve. As a result, they usually have no natural enemies to limit their reproduction and spread (Westbrooks 1998). Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function (Cronk and Fuller 1995). The canyon grasslands are the vegetative communities most impacted by invasive species as the most widespread invasive plant in the planning area is downy brome in complex with other exotic annual brome species. Because these plants are present to some extent in all grassland communities, weed inventories do not note these species. Yellow starthistle is the most prevalent broadleaf weed species and also is found in the canyon grasslands, often invading plant communities already degraded by downy brome.

Map 3-1 displays inventory data that is a compilation of efforts undertaken by the Tri-State, Salmon River, Joseph Plains, Upper Clearwater and Clearwater Basin WMAs. Some areas of the FO are not inventoried for weeds as they are outside WMAs or are not located in priority areas.

Map 3-1

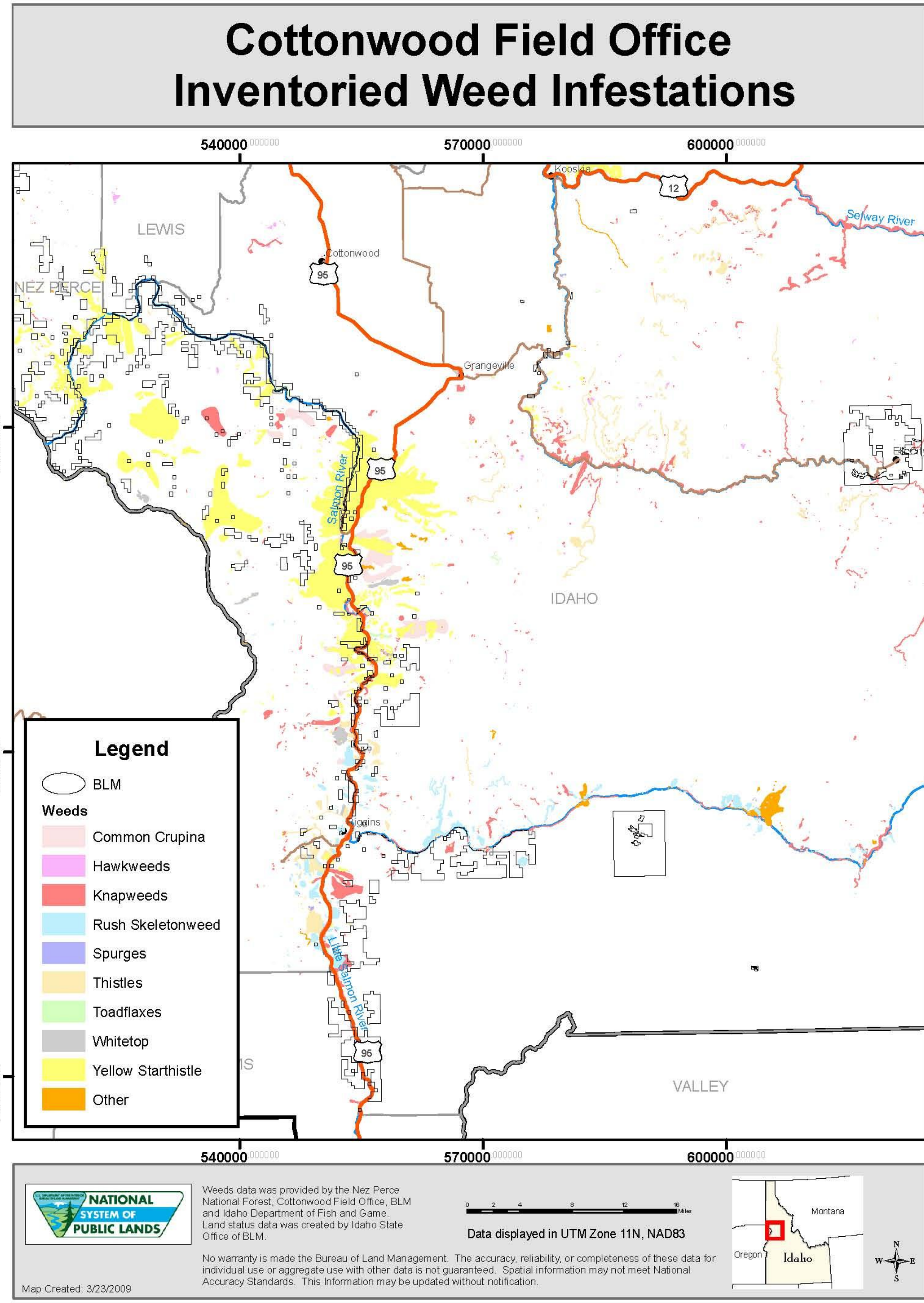

Cottonwood Field Office
Inventoried Weed Infestations
540000
570000
600000
5080000
5040000
5000000
LEWIS
NEZ PERCE
Cottonwood
Grangeville
Kooskia
Selway River
Salmon River
Little Salmon River
Riggins
IDAHO
VALLEY
95
12
Legend
BLM
Weeds
Common Crupina
Hawkweeds
Knapweeds
Rush Skeletonweed
Spurges
Thistles
Toadflaxes
Whitetop
Yellow Starthistle
Other
NATIONAL SYSTEM OF PUBLIC LANDS
Weeds data was provided by the Nez Perce National Forest, Cottonwood Field Office, BLM and Idaho Department of Fish and Game. Land status data was created by Idaho State Office of BLM.
Data displayed in UTM Zone 11N, NAD83
No warranty is made the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed. Spatial information may not meet National Accuracy Standards. This Information may be updated without notification.
Map Created: 3/23/2009
Montana
Oregon
Idaho
N
S
W
E

Table 3-2 displays the currently inventoried weed species acreage in the CFO. From inventory data, the most common invasive species on BLM lands are yellow starthistle, spotted knapweed, Scotch thistle, dalmation toadflax and rush skeletonweed. Departure from historical plant community composition depends highly upon the harshness of the site and past disturbance. The current conditions could reflect full conversion to an invasive plant community or native bunchgrass and forbs could remain with exotic species as a minor component. Plant communities impacted by historic heavy grazing pressures or disturbance due to human activity are more likely to have converted to mostly invasive species.

Table 3-2. Cottonwood Field Office Weed Species Acreage

Weed Name	Acreage in FO All Ownerships	Acres on BLM
Common crupina	10,947	88
Hawkweed (all species)	1,160	0
Knapweed (all species)	120,001	1,266
Rush skeletonweed	8,014	190
Leafy spurge	408	68
Thistles (all species)	9,900	420
Toadflax (yellow and dalmation)	555	192
Whitetop	2,405	154
Yellow starthistle	69,565	6,765
Other	7,464	48
Total	**230,419**	**9,191**

Rangeland monitoring has documented how yellow starthistle invasion has impacted native plant communities in the FO. Data taken at the Rattlesnake Ridge nested frequency site records how yellow starthistle can fully dominate an area in a few years (Table 3-3). In addition the data shows the decrease in the native grass, sand dropseed (*Sporabolus cryptandrus*) in contrast to continuing high levels of yellow starthistle frequency over time. Factors contributing to this decline are likely to include intense competition for available moisture and soil resources leading to the decline in health of established plants. Successful recruitment of native plant seedlings is also reduced or even eliminated through intense invasive plant competition for these same resources. When established plants decrease in vigor and die over time, no new plant recruitment is occurring to replace them resulting in a loss of that species presence in the plant community.

Table 3-3. Rattlesnake Ridge Nested Frequency Site Data

	% Frequency of Species			
	July 24, 1984	July 22, 1993	July 28, 2000	June 27, 2006
Yellow starthistle	0	85	81	96
Sand dropseed	84	56	10	13

One of the greatest concerns with invasive species is their impact on plant diversity in our native plant communities. As shown in the above data, over time, competition from exotic species can decrease the relative amount of a native species in a plant community. Exotic weed invasion can also impact other plant community parameters such as number of species present. Good ecological condition plant communities have a much richer diversity of plants including native forbs and grasses. Degraded plant communities typically have much less diversity with many of the plants being exotic annual weeds.

As elevation increases along the river breaks there is a related increase in precipitation levels. This seems to lessen the competitive advantage of invasives and native species seem to be able to recover after disturbance in line with a more natural successional pathway. At higher elevations, plant communities are more native in composition although there are invasive species more suited to compete in these habitats. Higher elevation plant communities impacted by some kind of disturbance are likely to experience a period of Canada thistle increase as a component of recovery to a more native composition. There are currently introductions of spotted knapweed, rush skeletonweed and various hawkweeds that could play a more significant role in these plant communities in the future.

Upland Vegetation

Vegetation types are diverse and represent a range of seral stages that are primarily influenced by livestock grazing, timber harvest, fires, exotic invasive species, and moisture availability. The canyon grasslands are primarily a broad extension of the Pacific bunchgrass formation. The dominant habitat types are bluebunch wheatgrass (*Pseudoroegneria spicata*) and Idaho fescue (*Festuca idahoensis*). Sand dropseed and red three-awn *(Aristida longiseta)* have become disclimax species on some river benches, bars, and toeslope areas. Yellow starthistle and annual grasses are common invaders of poor and fair ecological condition canyon grasslands within the CFO area. When a suitable seed source is available, yellow starthistle is also invading good quality grasslands.

As elevation and annual precipitation increase, shrubs begin to inhabit the northern and eastern aspects. Common shrub species include various roses (*rosa spp.*), ninebark (*Physocarpus malvaceus*), oceanspray (*Holodiscus discolor*), black hawthorn (*Crataegus douglasii*), and serviceberry (*Amelanchier alnifolia*). Conifers also grow in draws and northern and eastern aspects as an overstory. Elevations above 3,000 feet often have patterned grassland and timbered sites, with bluebunch wheatgrass and Idaho fescue on south and west aspects and conifers on north and east aspects. The conifer overstory may include Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), larch (*Larix occidentalis*), and ponderosa pine (*Pinus ponderosa*) depending upon habitat type. At higher elevations Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) habitat types are apparent and whitebark pine (*Pinus albicaulis*) occurs in the Marshal Mountain area. The timber may be interspersed with patches of perennial grassland, brush, and riparian vegetation. In addition, a small amount of meadow habitat (approximately 350 acres) is found within the FO.

There are six plants in the CFO that are not considered Idaho BLM sensitive species but current population or habitat information suggests that species may warrant sensitive species status in the future. These plants are; dwarf gray rabbitbrush *(Chrysothamnus nauseosus ssp. Nanus),* puzzling halimolobos *(Halimolobos perplexa var. perplexa)*; bank monkeyflower *(Mimulus clivicola),* Simpson's hedgehog cactus *(Pediocactus simpsonii),* and purple thick-leaved thelypody *(Thelypodium laciniatum var. streptanthoides).*

Riparian Vegetation

The riparian area adjacent to the Snake, Salmon, and Clearwater Rivers is often very narrow (20 to 40 feet) and is primarily associated with the mean high water area. The banks generally are rock and cobble, and have a bank slope of 10 to 40%. Common riparian vegetation includes coyote willow (*Salix exigua*), riverbank sage (*Artemsia ludoviciana*), poison ivy (*Toxicodendron radicans*), and hackberry (*Celtis occidentalis*). It is often common to have upland vegetation extend upslope immediately adjacent to the river bank. Annual brome grasses, bluebunch wheatgrass and sand dropseed are commonly found. Weedy species such as yellow starthistle, Canada thistle, and spotted knapweed have infested some riparian habitats.

Higher elevation riparian areas adjacent to the South Fork Clearwater River and Little Salmon River may have overstory trees which include: grand fir, Douglas-fir, and Engelmann spruce. Common understory species include mockorange (*Philadelphus lewisii*), black hawthorn, rocky mountain maple (*Acer glabrum*), red-osier dogwood (*Cornus stolonifera*), alder (*Alnus spp.*), willow (*Salix spp*.), and sedges (*Carex spp.*). Overall, mainstem river bank stability is good (99%+ stable). A variety of land uses have impacted riparian areas to varying degrees and include: highways, roads, mining, development (residences), communities, livestock grazing, feedlots, recreation sites, dispersed recreation, agriculture, and gravel mining operations.

Tributary streams often have narrow riparian zones that typically vary from 25 to 200 feet in width and are confined by the steep side slopes. The lower elevation riparian overstories are dominated by white alder (*Alnus rhombifolia*), black hawthorn, and water birch (*Betula occidentalis*); with occasional ponderosa pine, Douglas-fir, and black cottonwood (*Populus trichocarpa*). Common understory species include mockorange, serviceberry, elderberry (*Sambucus cerulea*), willow, red-osier dogwood, poison ivy, and oceanspray. At the mid to upper elevation areas, Douglas-fir and grand fir are more common in the overstories of the riparian areas. Common understory species include mockorange, black hawthorn, oceanspray, elderberry, gooseberry (*Ribes spp.*), rose, chokecherry (*Prunus virginiana*), rocky mountain maple, red-osier dogwood, alder, and willow. The higher elevation areas may have grand fir, Engelmann spruce, lodgepole pine (*Pinus contorta*), and subalpine fir. Meadow areas may be dominated with sedges, willow, and alder.

Approximately 195 acres of wetlands (mainly springs, seeps, marshes/ponds, and wet meadows) occur on CFO lands.

A majority of riparian habitats in the CFO are rated as being in good or excellent ecological condition with only an estimated 15 to 20 percent rated as being in poor to fair ecological condition. Table 3-4 summarizes functional condition of riparian habitats for streams/rivers flowing across or adjacent to BLM lands.

Table 3-4. CFO Riparian Condition Summary

Proper Functioning Condition	Functional at Risk - Upward Trend	Functional at Risk - Downward Trend	Functional at Risk - Unknown	Non-functional	Total Miles
512 Miles	15 Miles	48 Miles	2 Miles	2 Miles	579 Miles

Recent and past flood events and/or debris torrents have contributed to adverse channel and riparian impacts on some of the tributary drainages.

Most weed control actions involving herbicides occur in areas outside RCAs. However, river corridors are a vector of weed spread and are the preferred habitat for some weed species. Purple loosestrife, Japanese knotweed, perennial pepperweed, and spotted knapweed are examples of weeds currently being transported along river and stream courses in the FO. Salt cedar and Russian olive are examples of woody weed species seriously impacting riparian areas and stream courses in other areas of the country. Fires or soil disturbance in riparian areas often increase the opportunity for weed establishment or spread and lower elevation riparian areas often experience an exponential increase in weeds such as Scotch thistle after fire. An example of weed increase as a result of disturbance can be seen along the South Fork of the Clearwater River where spotted knapweed infests the riparian area, likely the result of disturbance caused by historical dredge mining. Weed control is a component of riparian management in the CFO.

ESA Listed and Candidate Species

The U.S. Fish and Wildlife Service (FWS) semi-annual species list update, dated May 9, 2011, identifies two listed plants which occur on lands administered by the BLM, CFO, MacFarlane's four-o'clock (*Mirabilis macfarlanei* - threatened) and Spalding's catchfly (*Silene spaldingii* - threatened). In July, 2011 whitebark pine (*Pinus albicaulis*) was designated a candidate species.

MacFarlane's Four-o'clock

In 1979, the FWS listed MacFarlane's four-o'clock as endangered under the Endangered Species Act and downlisted it to threatened in 1996. Five populations occur on CFO lands, one of which was transplanted by the BLM at the Lucile Caves RNA. Populations also occur on privately owned lands within the planning area. MacFarlane's four-o'clock habitat occurs in river canyon grassland habitats that are characterized by regionally warm and dry conditions where precipitation occurs mostly as rain during winter and spring. Sites are dry and generally open, although scattered shrubs may be present. Plants can be found on all aspects, but often occur on southeast to western aspects. Slopes may be steep or nearly flat. Soil texture varies from sand to sandy-loam with inclusions of talus. Populations range from approximately 1,000 to 3,500 feet in elevation and habitat generally consists of bunchgrass communities dominated by bluebunch wheatgrass. The updated recovery plan (USFWS 2000) has identified the following as reasons for the decline of and the current threats to *M. macfarlanei*: (1) accidental herbicide and pesticide spraying; (2) slope failures/landslides; (3) road repair/maintenance; (4) insect damage and disease; (5) invasion of habitat by exotic plant species; (6) livestock grazing; (7) fire suppression; (8) trampling; (9) off-road vehicles; (10) collecting; (11) mining; (12) competition for pollinators; and (13) inbreeding and depression. Nonnative plant species pose a serious threat to *M. macfarlanei* and other native plants because they compete for space, light, water, and nutrients.

Spalding's Catchfly

The FWS listed Spalding's catchfly as threatened under the ESA in 2001 and the CFO has the largest known population in Idaho (Garden Creek). Four populations occur on BLM lands within the Lower Snake River subbasin and eleven populations occur on BLM lands in the Lower Salmon River subbasin. These populations are threatened by yellow starthistle, dalmation toadflax, rush skeletonweed, and other weed infestations. One of the Salmon River canyonland populations is currently threatened by leafy spurge, whitetop, and other weeds (Gray and Lichthardt 2003). This species is primarily restricted to mesic (not extremely wet or extremely dry) grasslands. These grasslands may occur in prairie, steppe or canyon grassland communities and make up the Palouse Region in southeastern Washington, northwestern Montana, and adjacent portions of Idaho and Oregon. Palouse habitat is considered to be a subset of the Pacific Northwest bunchgrass habitat type. In Idaho, Palouse habitat is confined to a narrow band along the western edge of central and north-central Idaho centering on Latah County (Tisdale 1983). Large-scale ecological changes in the Palouse region over the past several decades, including agricultural conversion, changes in fire frequency, and alterations of hydrology, have resulted in the decline of numerous sensitive plant species, including *S. spaldingii* (Tisdale 1961). More than 98 percent of the original Palouse prairie habitat has been lost or modified by agricultural conversion, grazing, invasion of nonnative species, altered fire regimes, and urbanization (Noss et al. 1995). The recovery plan for Spalding's catchfly (USFWS 2007) has identified the following as reasons for the decline of and the current threats to the species: 1) Invasive nonnative plants; 2) Problems associated with small, geographically isolated populations; 3) Changes in the fire regime and fire effects; 4) Land conversion associated with urban and agricultural development; 5) Adverse livestock grazing and trampling; 6) Herbicide and insecticide spraying; 7) Adverse grazing and trampling by wildlife species; 8) Off-road vehicle use; 9) Insect damage and disease; 10) Impacts from prolonged drought and climate change; and 11) Inadequacy of existing regulatory mechanisms.

Whitebark Pine

Whitebark pine typically occurs on cold and windy high-elevation sites in western North America. It is considered a keystone species because it increases biodiversity and contributes to critical ecosystem functions. Whitebark pine is frequently the first conifer to become established after disturbances like wildfire and subsequently stabilizes soils and regulates runoff. Snow will drift around whitebark pine trees thereby increasing soil moisture, modifying soil temperatures, and holding soil moisture later into the season. Whitebark pine frequently shade, protect, and slow the progression of snowmelt, essentially reducing spring flooding at lower elevations. Whitebark pine also provides important, highly nutritious seeds for numerous birds and mammals.

The objective of the BLM special status species policy in relation to ESA listed plants is. "To conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species." (BLM 2008)

BLM Sensitive Plants

BLM special status plants include species designated as sensitive by the Idaho BLM State Director. The objective of the BLM special status species policy in relation to BLM sensitive plants is: To initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA (BLM 2008).

The CFO has 28 plant species designated as sensitive. Idaho BLM sensitive plant species, ranking, and preferred habitat are listed in Appendix 2 – *Idaho BLM Sensitive Species in the Cottonwood Field Office*.

3.2.3 Water Quality

The CFO contains numerous streams which are primarily tributaries to three major river systems the Clearwater, Salmon and Snake. Lands managed by the CFO occur within 10 subbasins and approximately 579 miles of streams and rivers flow across or adjacent to those lands. Six lakes totaling twenty-eight surface acres are also located within the FO. BLM lands comprise from less than 0.1percent to 7.0 percent of total lands within the subbasins. Ownership is often fragmented and discontinuous along streams and rivers. In most instances, the FS manages much of the upper watersheds with scattered BLM and mostly private ownership occurring in the remainder of the drainage. In the case of streams originating on the Camas Prairie, upper watersheds are privately owned and some BLM ownership is located in the steep canyons and breaklands before drainages flow into the mainstem rivers. Total stream lengths and land acreage managed by the BLM within most drainages are minimal; therefore, BLM actions tend to have minimal impact on watershed scale water quality parameters. Due to numerous ownerships, history of watershed disturbance and impacts of management, numerous streams occur in the FO that have been listed on the State of Idaho Department of Environmental Quality 303(d) list denoting them as having impaired water quality.

Table 3-5 notes the names of the 303(d) listed streams and the pollutants of concern in each of the subbasins where BLM managed lands occur.

Table 3-5. 303(d) Listed Waterbodies with BLM Lands in the Watershed

Waterbody	Hydrologic Unit Code Number	Pollutant(s) of Concern
Snake River Subbasin		
Snake River	17060101	Temperature
Divide Creek (2905)	170601010201	Sediment
Wolf Creek (2906)	170601010301	Sediment
Getta Creek (2907)	170601010402	Sediment
Lower Snake River Subbasin		
Snake River	17060103	Temperature
Lower Salmon River Subbasin		
China Creek (3321)	170602090103	Sediment
Deer Creek (3323)	170602090301	Sediment
Cottonwood Creek (3324)	170602090403	Sediment
Maloney Creek (3325)	170602090402	Bacteria, flow alteration, nutrients, sediment, temperature
Deep Creek (3326)	170602090501	Bacteria, flow alteration, habitat alteration, nutrients, sediment, temperature
Rice Creek (3327)	170602091701	Sediment
Rock Creek (3328)	170602090601	Sediment
Skookumchuck Creek (5157)	170602091001	Sediment
Slate Creek (3333)	170602091101	Sediment
China Creek (5041)	170602091201	Sediment
Race Creek (3336)	170602091205	Sediment

Waterbody	Hydrologic Unit Code Number	Pollutant(s) of Concern
Little Salmon River Subbasin		
Little Salmon River (2863)	17060210	Sediment
Squaw Creek (2865)	170602100103	Sediment
Elk Creek (2869)	170602100102	Sediment
Big Creek (2877)	170602100403	Nutrients, sediment
Middle Salmon River Subbasin		
Warren Creek (3352)	170602071901	Habitat alteration (dredge mining)
Clearwater River Subbasin		
Clearwater River (3139)	17060306	Total Dissolved Gas
Potlatch River (3149)	170603060202	Bacteria, dissolved oxygen, flow alteration, habitat alteration, ammonia, nutrients, oil/gas, organic, pesticides, sediment, temperature
Middle Potlatch Creek (5125)	170603060302	Bacteria, flow alteration, habitat alteration, nutrients, sediment, temperature
Big Bear Creek (5225)	170603060401	Temperature
Lolo Creek (3173)	17060306	Bacteria, dissolved oxygen, flow alteration, habitat alteration, nutrients, oil/gas, sediment, temperature
Schmidt Creek (5223)	17060306	Unknown
South Fork Clearwater River Subbasin		
South Fork Clearwater River (5185)	17060305	Habitat alteration, sediment, temperature
Threemile Creek (3291)	170603051201	Bacteria, dissolved oxygen, flow alteration, habitat alteration, ammonia, nutrients, sediment, temperature
Buffalo Gulch (5030)	170603050601	Sediment
Big Elk Creek	170603050602	Temperature
Little Elk Creek	170603050602	Temperature

In general the overall water quality of the streams and rivers are rated as fair to good. Yearly snowmelt and resultant runoff typically cause increased suspended sediment concentrations and turbidity during the spring and early summer. Events of high sediment concentration also occur as a result of high intensity summer thunderstorms. Water temperatures tend to increase in late spring, with highest temperatures generally occurring July through August. Many tributaries have elevated summer water temperatures, which often reach 20^{o} C or above.

Sediment loads in watercourses above normal levels are periodically seen in the FO as a result of wildfire or high intensity convective storms. Removal of protective vegetation and groundcover by wildfire typically increases fine sediment movement into streams, particularly the spring after fire occurrence and impacts to water quality can be seen two to three years post fire in the grasslands. Watersheds where forested vegetation is the primary ground cover often result in higher fire intensities and it can take longer for watershed recovery. The FO has had incidents of large debris torrents occurring as a result of high intensity summer thunderstorms or post fire accumulation of high quantities of dead wood material in stream courses. Elevated deposited sediment levels exist in many tributaries. The amount of deposited sediment is dependent on channel types, flow regimes, land types, and land uses within the watershed.

Stream channels are highly variable throughout the CFO management area. Headwater streams, breakland streams, and smaller tributary streams are predominately A2, A3, and A3+ channel types (Rosgen 1996). These are steep-gradient, confined channels, with high sediment transport capacity. These steep gradient streams may be subject to frequent scouring events. The larger tributaries are typically B3 and B4 channel types, which are moderate gradient and are moderately confined. These channels are also efficient at sediment transport. The upper reaches of some streams flowing through low gradient prairie areas, meadows, or forest stringer meadows generally have C and B channel types.

Some watersheds in the CFO management area illustrate the dramatic effect that land cover changes have had on the hydrology of the watershed. Conversion of Palouse Prairie vegetation into dryland agriculture is the primary land cover change. Compared to historic conditions, these watersheds have much less water storage resulting in lower base flows after runoff events. Water moves quicker through these altered watersheds during runoff or high precipitation summer thunderstorms producing higher peak flows and larger volumes. Higher peak flows may impact stream channels by widening and scouring channels and provide the energy for transporting and moving large substrate downstream.

3.2.4 Fisheries and Special Status Fish

Fish species are widely distributed and occupy a variety of habitats including large rivers, tributary streams, ponds, and lakes. Fish habitats occur from low elevation canyonlands to high elevation subalpine areas. The CFO management area is known to support 39 species of fish, including 26 native species and 13 nonnative species (see Table 3-6 and 3-7).

Table 3-6. Native Fish Known to Inhabit the CFO Management Area

Common Name	Scientific Name	Common Name	Scientific Name
Bridgelip sucker	*Catostomus columbianus*	Paiute sculpin	*Cottus beldingi*
Bull trout	*Salvelinus confluentus*	Peamouth	*Mylocheilus caurinus*
Chiselmouth	*Acrocheilus alutaceus*	Redband trout	*Oncorhynchus mykiss gairdneri*
Coho salmon	*Oncorhynchus kisutch*	Redside shiner	*Richardsonius balteatus balteatus*
Fall Chinook salmon	*Oncorhynchus tschawytscha*	Shorthead sculpin	*Cottus confuses*
Largescale sucker	*Catostomus macrocheilus*	Slimy sculpin	*Cottus cognatus*
Leopard dace	*Rhinichthys falcatus*	Sockeye salmon	*Oncorhynchus nerka*
Longnose dace	*Rhinichthys cataractae dulcis*	Speckled dace	*Rhinichthys osulus*
Mottled sculpin	*Cottus bairdi semiscaber*	Spring/summer Chinook Salmon	*Oncorhynchus tschawytscha*
Mountain sucker	*Catostomus platyrhynchus*	Summer steelhead	*Oncorhynchus mykiss*
Mountain whitefish	*Prosopium williamsoni*	Torrent sculpin	*Cottus rhotheus*
Northern pikeminnow	*Ptychocheilus oregonensis*	Westslope cutthroat trout	*Oncorhynchus clarki lewisi*
Pacific lamprey	*Lampetra tridentate*	White sturgeon	*Acipenser transmontanus*

Table 3-7. Nonnative Fish Known to Inhabit the CFO Management Area

Common Name	Scientific Name	Common Name	Scientific Name
Blue catfish	*Ictalurus furcatus*	Kokanee salmon	*Oncorhynchus nerka kennerlyi*
Bluegill	*Lepomis macrochirus*	Rainbow trout	*Oncorhynchus mykiss*
Brook trout	*Salvelinus fontinalis*	Smallmouth bass	*Micopterus dolomieu*
Brown bullhead	*Ictalurus nebolusus*	White crappie	*Pomoxis annualris*
Carp	*Cyprinus carpio*	Yellow perch	*Perca flavescens*
Channel catfish	*Ictalurus punctatus*	Yellowstone cutthroat trout	*Oncorhynchus clarki bouveri*
Flathead catfish	*Pylodictus olivaris*		

One hundred and ninety-two miles of fish-bearing streams and rivers flow across or adjacent to lands managed by the CFO as well as six lakes that provide fish habitat. Table 3-8 provides a summary of fish bearing stream segments.

Table 3-8. BLM Land Ownership and Fish Bearing Rivers/Streams within Subbasins

Subbasin Name and Hydrologic Unit Number (Acres)	Main Stem River (Miles)	Tributaries (Miles)		Total (Miles)
Lower Snake River – Asotin 17060103 (17,129 acres)	1.5	4 streams	6.4	7.9
Snake River – Hells Canyon 17060101 (3,912 acres)	0.0	4 streams	1.8	1.8
Lower Salmon River 17060209 (51,761 acres)	78.75	30 streams	20.35	99.1
Little Salmon River 17060210 (16,344 acres)	3.2	11 streams	11.4	14.6
Middle Salmon –Chamberlain 17060207 (9,594 acres)	0.0	3 streams	6.0	6.0
South Fork Salmon River 17060208 (840 acres)	0.0	1 stream	0.4	0.4
Clearwater River 17060306 (10,096 acres)	16.0	3 streams	11.0	27.0
Lower North Fk. Clearwater River 17060308 (18 acres)	0.15		0.0	0.15
South Fork Clearwater River 17060305 (14,526 acres)	5.5	20 streams	29.2	34.7
Middle Fork Clearwater River 17060304 (80 acres)	0.0	1 stream	0.5	0.5
Totals	**105.1**		**87.05**	**192.15**

Overall connectivity between fish populations within the planning area remains intact. The primary exception occurs at some road crossings where partial or complete barriers resulting from culverts or roads may prevent passage for juvenile and adult fish. Connectivity between populations and subpopulations is critical for providing genetic diversity.

In general, water quality, riparian habitats, and fish/aquatic habitats have experienced slight upward trends during the past one to two decades within drainages that have a majority of ownership as federal and/or Idaho Department of Fish and Game. Such aquatic habitats improvements are primarily attributed to improved public land management practices, restoration activities, and federal listing of fish under the ESA.

ESA-Listed Species

The CFO area provides habitat for ESA listed Snake River sockeye salmon (*Oncorhynchus nerka*), Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*), Snake River spring/summer Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*).

The ESA-listings of the above species requires the BLM to ensure that all actions authorized or funded by the agency are not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of designated or proposed critical habitat of listed species [ESA Section 7 (a)(2) and (4)]. A Biological Assessment was prepared by the CFO and submitted to NMFS and FWS to analyze the impacts of the proposed action to ESA listed fish (BLM 2011). Information from that document is summarized in this EA, and it is available upon request to the Cottonwood Field Office.

Table 3-9 identifies the approximate period when ESA-listed species/life stage is present in the CFO management area.

Table 3-9. Occurrence of ESA-Listed Fish Species Lifestages

Lifestage	Sockeye Salmon	Sp/Summer Chinook Salmon	Fall Chinook Salmon	Steelhead Trout	Bull Trout
Adult Migration	May – July Salmon and Snake Rivers	Apr. – July mainstem rivers	Sep. – Oct. mainstem rivers	Aug. – Apr. mainstem rivers	June – Aug. mainstem rivers
Adult Spawning	Sep. – Oct. N/A headwaters Salmon River	Aug. – Sep. trib. streams	Oct. – Dec. mainstem rivers	Mar. – June trib. streams	Late Aug. – Sep. trib. streams
Adult Overwintering	N/A	N/A	N/A	Nov. – Mar. main-stem rivers	Nov. – Mar. mainstem rivers
Adult/Subadult Rearing	N/A	N/A	N/A	N/A	Yearlong, mainstem rivers & trib. streams
Incubation & Emergence	Oct. – May N/A headwaters Salmon River	Sep. – May trib. streams	Nov. – May mainstem rivers	Mar. – June trib. streams	Sep. – May trib. streams
Juvenile Rearing	2 years N/A headwaters Salmon River	1 year tributary streams	2 – 5 months mainstem rivers	1 – 3 years trib. streams	2 – 3 years trib. streams
Smolt Emigration	Apr. – Aug Snake and Salmon Rivers	Apr. – July mainstem rivers	June – Aug. mainstem rivers	Apr. - July mainstem rivers	N/A

Sockeye salmon**:** The Snake River sockeye salmon was listed as endangered on November 20, 1991 (Federal Register, Vol. 56, 58619). Critical habitat was designated on December 28, 1993 (Federal Register, Vol. 58, 68543), effective on January 27, 1994.

No sockeye salmon spawning or rearing occurs within the CFO although the Snake and Salmon Rivers are used by sockeye as downstream and upstream migration corridors

Spring/summer Chinook salmon**:** The Snake River spring/summer Chinook salmon was listed as threatened on May 22, 1992 (Federal Register, Vol. 57, 14653). Critical habitat was designated on December 28, 1993 (Federal Register, Vol. 58, 68543), effective on January 27, 1994. Approximately 119 miles of the Snake River, Salmon River, Little Salmon River, and tributary drainages flowing across or adjacent to BLM lands provide habitat for spring/summer chinook salmon. Adults use the mainstem rivers as juvenile and adult migration corridors, and to a limited extent for juvenile rearing. Tributary streams providing suitable habitat are used for spawning and juvenile rearing.

After emergence, fry concentrate in shallow, slow water near stream margins with cover (Hillman et al. 1987). As fry grow, they occupy deeper pools with submerged cover during the day and shallower inshore habitat at night. Key habitat factors for juvenile rearing include streamflow, pool morphology, cover, and water temperature (Steward and Bjornn 1990). They tend to be most abundant in low gradient, meandering stream channels.

Fall Chinook salmon**:** The Snake River fall Chinook salmon was listed as threatened on May 22, 1992 (Federal Register, Vol. 57, 14653). Critical habitat was designated on December 28, 1993 (Federal Register, Vol. 58, 68543), effective on January 27, 1994.

Fall Chinook salmon use mainstem rivers as juvenile and adult migration corridors and for spawning and rearing. Adults spend three to four years in the ocean and return to the Snake, Clearwater, and Salmon Rivers to spawn. They will also utilize small rivers such as the South Fork Clearwater River and Potlatch River for spawning habitat.

Temperature may influence suitability of spawning habitat. The primary evolutionary factor determining time of spawning may be the number of temperature units required for successful incubation of embryos (Heggberget 1988). Fall Chinook salmon are deep water spawners. Studies of redd locations by Groves and Chandler (1999) concluded that as much as 80% of spawning within the Columbia River may occur at depths too deep to be viewed by typical above-water techniques. They also found that deep water spawning is common within the Snake River, accounting for 20 – 50% of spawning, and can influence the limits and distribution of habitat-use criteria.

After emergence, fry concentrate in shallow, slow water near river banks that provide cover. These areas are often associated with a narrow band of riparian vegetation along the margins of the mainstem river.

Steelhead trout**:** Steelhead trout in the Snake River basin have been listed as threatened under the ESA with an effective listing date of October 17, 1997 (Federal Register, August 18, 1997, Vol. 62, 43937). Critical habitat was designated on September 2, 2005 (70 FR 52630) and includes fishbearing streams and rivers within the CFO management area which were designated in the Federal Register. Steelhead are the anadromous form of rainbow (redband) trout.

Steelhead trout use mainstem rivers in the CFO as juvenile and adult migration corridors, for adult over-wintering, and to a limited extent for juvenile rearing habitat. Tributary streams are used by steelhead trout for spawning and juvenile rearing. Mouth areas of larger tributaries may be used by juvenile steelhead trout for rearing when flow conditions are suitable.

Summer run steelhead are distributed throughout the CFO and are described as either "A" run or "B" run, based on the time of passage over Bonneville Dam. Fish passing Bonneville Dam before August 25 are called "A" run steelhead. These fish have generally spent one year in the ocean and mainly consist of animals originating in the Snake and Salmon River drainages. Fish passing Bonneville Dam after August 25 are called "B" run steelhead. The "B" run fish have generally spent two years in the ocean and mainly consist of animals originating in the Clearwater River drainage. There is some overlap in timing and range of the two stocks.

Life stages are closely linked to habitat characteristics. Steelhead spawn in sorted gravels primarily in tributaries of mainstem rivers. Incubation success is influenced by fine sediment, temperature, and flow (Chapman 1988). After emergence, fry typically move into shallow and low velocity channel margins (Everest and Chapman 1972). As fish become larger, preferred habitats change and fry use areas with deeper water, a wider range of velocities, and larger substrate.

Habitat requirements of steelhead vary by season and life stage (Bjornn and Reiser 1991). Steelhead distribution and abundance may be influenced by water temperature, stream size, flow, channel morphology, riparian vegetation, cover type and abundance, and substrate size and quality (Everest 1973; Li et al. 1994; Reiser and Bjornn 1979).

***Bull trout*:** On July 10, 1998, the FWS listed the Klamath and the Columbia River population segment of bull trout as threatened (Federal Register, June 10, 1998, Vol. 63, 31647). On October 18, 2010, the FWS designated critical habitat for bull trout throughout their U.S. range. The final rule for the revised designation of critical habitat became effective on November 17, 2010 (Federal Register, October 18, 2010, Vol. 75, No. 200, 63898).

Bull trout use mainstem rivers for migration corridors and for adult and subadult foraging habitat. Tributary streams providing suitable habitat conditions are used for spawning and juvenile rearing.

Two distinct life-history forms, migratory and resident, occur throughout the range of bull trout (Pratt 1992, Rieman and McIntyre 1993). Migratory bull trout rear in tributary streams for several years before either migrating into larger river systems (fluvial) or lakes (adfluvial). Migratory fish are believed to be critical for both genetic exchange between local populations and population rebuilding or recolonization. Resident fish are much smaller than migratory forms of bull trout (Idaho 1996).

Bull trout appear to have more specific habitat requirements than other salmonids. Strong bull trout populations require high stream channel complexity, including instream wood and substrate with open interstitial spaces. Temperature is a critical habitat requirement for bull trout, with their distribution generally associated with the coldest stream reaches within basins. Additionally, channel stability, winter high flows, summer low flows, substrate, cover, temperature, and the presence of migration corridors appear to influence bull trout distribution and abundance (Idaho 1996).

BLM Idaho Sensitive Fish Species

Four Idaho BLM sensitive fish species also occur within the analysis area: westslope cutthroat trout, redband trout, spring/summer Chinook salmon in the Clearwater River basin, and Pacific lamprey.

Westslope cutthroat trout**:** Three life history strategies of westslope cutthroat trout occur and include; adfluvial, fluvial, and resident (Liknes and Graham 1988). Those most common in central Idaho include fluvial and resident forms, with fluvial fish comprising the only migratory populations in larger river systems. Mainstem rivers are used as migration corridors, provide adult rearing habitat and are used to a lesser extent for juvenile rearing. Spawning generally occurs in tributary streams providing suitable habitats during the spring with initiation of spawning behavior strongly correlated with water temperature.

Redband trout: Redband trout in the Upper Columbia River basin have been divided into two groups. One group evolved within the historical range of steelhead trout (sympatric). The other group evolved outside the historical range of steelhead trout (allopatric). Sympatric redband trout are considered the non-anadromous form of steelhead and are also known as “residuals”. Juvenile steelhead and redband are indistinguishable. The redband trout have similar life histories as steelhead trout, with the exception of smolts outmigrating and adults spending time in the ocean before migrating back to Idaho natal streams to spawn.

Spring/summer Chinook salmon**:** Spring/summer Chinook salmon in the Clearwater River basin are designated as a BLM sensitive species because it is believed that indigenous populations were eliminated from the Clearwater River basin by construction of Lewiston Dam which virtually eliminated all runs of wild Chinook salmon in the Clearwater Basin until its removal in the 1940s. Naturally spawning runs have been established through supplementation with hatchery fish. Life history is the same as described for ESA-listed salmon above.

Pacific lamprey**:** Pacific lamprey adults enter freshwater in the Columbia River between July and September and migrate over 400 miles to Idaho. They do not mature until the following March. They spawn in sandy gravel immediately upstream from riffles between April and July and die soon after. Eggs hatch in two to three weeks and the ammocoetes (larval lamprey) spend up to six years in soft substrate as filter-feeders before emigrating to the ocean. They remain in the ocean for 12 to 20 months before returning to freshwater to spawn.

3.2.5 Wildlife and Special Status Wildlife

The diverse topography, vegetation, and climate in the CFO result in a variety of habitats for wildlife varying from low-elevation canyon grasslands to high-elevation subalpine fir habitats. The presence of any species may be seasonal or year-round depending on individual species requirements. Of particular importance to wildlife are critical habitat niches and habitats used by species for breeding, young rearing, foraging, traveling, habitat connectivity, and security.

Approximately 250 species of wildlife occur in the CFO. Among them are two ESA-listed species, two ESA candidate species, and 37 Idaho BLM sensitive species. Wildlife groupings include big game, predators, furbearers, carnivores, small mammals, upland game birds, waterfowl, raptors, song birds, snag-dependent species, amphibians, and reptiles.

Big game species include elk, mule deer, whitetail deer, moose, bighorn sheep, bears, mountain lion, gray wolf, and mountain goats. The Salmon River, Snake River, and Clearwater River canyon lands provide important seasonal habitats for a variety of big game ungulate species, upland game, and nongame species. Yellow starthistle infestations along with other invasive plant infestations have degraded big game habitat values in areas.

Upland game species include chukar partridge, gray partridge, ruffed grouse, spruce grouse, blue grouse, California quail, mountain quail, turkeys, pheasant, and mourning doves.

Approximately 579 miles of streams and rivers flow across BLM lands. Riparian habitats provide some of the most important habitats for wildlife, providing structural diversity, shade and water and food sources.

Idaho has 243 species of birds that breed in the state, with 119 species being neotropical migrants, birds that breed in Idaho but migrate to winter in the neotropics of Mexico, Central America, the Caribbean, and South America (Idaho Partners in Flight 2000). Neotropical migratory birds use all habitats within the project area during the breeding season. The Idaho Bird Conservation Plan (Idaho Partners in Flight 2000) identified four priority habitats for Idaho, three of which occur within the CFO management area (Riparian Habitat, Non-riverine Wetlands, and Dry Ponderosa Pine, Douglas-fir, and Grand Fir Forests. Bird species that may occur in the project area and are identified as priority species in the conservation plan are listed in Table 3-10 below, along with other habitats identified and priority species.

Table 3-10. Idaho Partners in Flight Priority Habitats and Priority Species

Primary Habitat Type	High Priority Species
Priority Habitat	
Riparian Habitat	Calliope Hummingbird[1], Rufous Hummingbird[1], Willow Flycatcher[1], Dusky Flycatcher[1], American Dipper, Yellow Warbler[1], and MacGillivray's Warbler[1]
Non-riverine Wetlands	Western Grebe[1], Trumpeter Swan, Cinnamon Teal[1]
Dry Ponderosa Pine, Douglas-fir, and Grand Fir Forests	White-headed Woodpecker, Pygmy Nuthatch, Lewis' Woodpecker, Flammulated Owl
Other Habitats	
Grassland	Western Meadowlark, Prairie Falcon
Low-elevation Mixed Conifer Forest	Lewis Woodpecker, Williamson's Sapsucker[1], Dusky Flycatcher[1], Varied Thrush, Townsend's Warbler[1], Northern Goshawk, Western Tanager[1], Sharp-shinned Hawk, and Brown Creeper
Mountain Brush	Mountain Quail, Black-chinned Hummingbird[1], Calliope Hummingbird[1], Rufous Humminbird[1], MacGillvray's Humming Bird[1]
Alpine	Black Rosy-Finch
High-Elevation Mixed Conifer Forest	Hammond's Flycatcher[1], Olive-Sided Flycatcher[1], Clark's Nutcracker
Cedar and Hemlock Forest	Vaux's Swift[1], Brown Creeper

[1]Neotropical Migratory Birds

ESA-Listed Species

A Biological Assessment was prepared by the CFO and submitted to NMFS and FWS to analysis the impact of the proposed action to ESA listed animals (BLM 2011). Information from that document is summarized in this EA.

Canada Lynx

The final rule listing Canada lynx as a threatened species in the contiguous Unites States was published on March 24, 2000 (FR, Volume 65, No. 58). The *Lynx Conservation Assessment and Strategy* (Ruediger et al. 2000) was developed by the FS, FWS, National Park Service, and BLM to provide a consistent and effective approach to conserve Canada lynx on federal lands in the contiguous United States.

The CFO management area has lynx analysis units and contains suitable lynx habitat that could be affected by vegetation treatments; although limited amounts of invasive plant treatment would occur within suitable lynx habitat areas. Potential treatments may be along roads or disturbed areas and herbicide treatments would primarily be ground based.

In Idaho, lynx are most often found in areas above 4,000 feet in elevation, and in Engelmann spruce and subalpine fir forests (Koehler and Brittell 1990). Important habitat features include den sites, foraging habitat and travel routes. Den sites are typically located in hollow logs or rootwads within mesic, mature or old growth coniferous forest (Koehler and Brittell 1990).

Timber stands used for denning are between one and five acres and are connected by travel corridors through mature forest. Favored travel routes are forested areas along ridges and saddles. Lynx foraging habitat corresponds with snowshoe hare habitat, because the hare is the lynx's favored prey comprising 35-97% of the diet (Koehler and Aubry 1994). Snowshoe hare are most abundant in young stands of sapling lodgepole pine, subalpine fir, and Engelmann spruce. Other prey species taken by lynx include red squirrels, grouse, flying squirrels, ground squirrels, mice, voles, porcupines, beaver, and ungulates as carrion or occasionally as prey (O'Donoghue et al. 1998, Koehler 1990, Brand and Keith 1979, Brand et al. 1976, Nellis et al. 1972, Van Zyll de Jong 1966, Saunders 1963).

Northern Idaho Ground Squirrel

The northern Idaho ground squirrel was listed as Threatened on April 5, 2000 (65 Federal Register 17779-17786) and the FWS approved a recovery plan for the species on July 28, 2003 (USFWS 2003). The ultimate goal of the recovery plan is to increase the population size and establish a sufficient number of viable metapopulations of northern Idaho ground squirrels so that this subspecies can be delisted.

The northern Idaho ground squirrel prefers dry, rocky, sparsely vegetated meadows surrounded by ponderosa pine or Douglas fir at elevations of 3,800 to 5,200 feet. Its present range is north of Council, Idaho extending to the Boulder Creek drainage. BLM lands do provide suitable habitat for the species in the vicinity of New Meadows, however, there are no documented occurrences of northern Idaho ground squirrel on BLM lands to date.

ESA - Candidate Species

Yellow-Billed Cuckoo

The yellow-billed cuckoo in the western United States was accorded candidate status in July 2001 (FR 66:38611 – 38626). Yellow-billed cuckoos prefer riparian areas with dense stands of cottonwood and willow. In northern and central Idaho there have been four documented reports of yellow-billed cuckoo over the last century. In southwestern Idaho, the yellow-billed cuckoo is considered a rare, sometime erratic, visitor and breeder in the Snake River valley with less than 15 sightings recorded during the past 25 years. No recent confirmed observations for yellow-billed cuckoo exist in the CFO and limited amounts of suitable cottonwood stands occur in the management area.

Wolverine

The wolverine in the western United States was accorded candidate status on December 14, 2010 (FR 75:78030 – 78061). Wolverines are restricted to high mountain environments near treeline where conditions are cold year-round and snow cover persists well into the month of May. Deep, persistent, spring snow is required for successful wolverine reproduction because females dig elaborate dens in the snow to protect kits from predators and the harsh conditions of alpine winters. Wolverines naturally occur at low densities and are rarely encountered where they do occur.

The CFO management area has limited amounts of suitable wolverine habitat that would be affected by vegetation treatments. Overall, limited amounts of invasive plant treatments are currently occurring within wolverine habitat areas, primarily along roads or disturbed areas and herbicide treatments are primarily ground based.

Idaho BLM Sensitive Animal Species

Appendix 2 lists the BLM sensitive species which occur or potentially could occur within the CFO, along with preferred habitats for each species.

3.2.6 Soils

Soils in the CFO are affected by several physical properties, including, topography, and parent materials. Primary parent materials include the Idaho Batholith, bordering metamorphic rocks (including the Belt Super Group), and Columbia River basalts.

Throughout the eastern portion of the CFO, coarse-textured, highly erodible soils form in the Idaho Batholith. These soils are concentrated east and south of the Salmon River and east of the Little Salmon River. West of the Idaho Batholith, soils associated with the metamorphic rocks are exposed in the canyon bottoms and along lower walls of the Snake, Salmon, Little Salmon, and Clearwater Rivers. Resulting soil types are typically medium grained and highly erodible. In the Elk City area, the South Fork of the Clearwater River and its tributaries drain a region of soils formed in similar but much older metamorphic rocks. The landforms are characterized by rounded hills and meandering stream channels. Soil types are generally similar to other metamorphic rocks found in the region.

Throughout the western portion of the FO, soils form in thick sequences of Columbia River basalt flows and interbedded sedimentary deposits. These soils meet the western margin of the Idaho Batholith. At one time, the basalt flows formed an extensive plateau across the region. However, erosion has since created a dissected landform of deeply incised river canyons with the uplands capped by isolated remnants of basalt.

Detailed soil surveys prepared by the US Department of Agriculture, Natural Resources Conservation Service (NRCS) are available for most of the planning area and are referenced when developing projects. Most of the land area where weed control is taking place is located in Idaho County. This soil survey is readily available and detailed soils information from the report can be easily accessed on the NRCS web soil survey site.

Important components of soils that may be impacted by herbicides include biological soil crusts and soil microorganisms. Biological soil crusts bind the surface of soils in the interspace between plants reducing erosion and are known to fix atmospheric nitrogen. Crusts are composed of nonvascular plants and can include cyanobacteria, green and brown algae, mosses, and lichens, as well as liverworts, fungi, and bacteria (Belnap and Phillips 2001). Climatic conditions in the CFO favor the formation of crusts high in moss composition (Rosentreter 2004).

Microorganisms help break down and convert organic remains into forms that can be used by plants. Microorganisms, such as mycorrhizal fungi, nitrogen fixing organisms, and certain types of bacteria assist in plant growth, suppress plant pathogens, and build soil structure. Soil microorganisms are also important in the breakdown of certain types of herbicides.

3.2.7 Native American Tribal Uses

The federally recognized Nez Perce Tribe has long used natural resources and conducted its social and religious activities in the area encompassed by the CFO. The Nez Perce Tribe and the US signed various treaties and agreements that relinquished ownership of millions of acres of land to the US, established and modified the Nez Perce Reservation to guarantee a permanent homeland for the tribe, and maintained the tribe's rights to fish, hunt, gather and pasture its animals on open and unclaimed lands. Due to the direct relationship with and access to natural resources guaranteed by these treaties, BLM natural resource management decisions have the potential to affect tribal uses.

The BLM manages a portion of the Nez Perce ceded lands and maintains a government-to-government relationship with the tribe. These areas were once used by the tribe for settlement, subsistence, and religious use. The BLM now has a trust responsibility to provide the conditions necessary for Indian tribal members to satisfy their treaty rights guaranteed them in the 1800s. Today, the Nez Perce utilize resources on BLM public lands within their ceded territory for subsistence and cultural purposes.

There is a record of long-term use of the ecosystem by the Nez Perce prior to Euro-American settlement. This use was based on a balance between the human population and the ecosystem. This balance was disturbed by the arrival of Euro-Americans in the area. Changes in resource uses have introduced nonnative plant and animal species and reduced other plant species that were traditionally used by the Nez Perce. Without the plants available for use, the intertwined socio-cultural values associated with the gathering and processing of the plants or animals are lost or diminished.

3.2.8 Cultural Resources

Cultural resources are locations of human activity, occupation or use. They include expressions of human culture and history in the physical environment such as prehistoric or historic archaeological sites, buildings, structures, objects, districts, or other places. Cultural resources in the CFO area are found in a variety of forms which include: open lithic sites that consist of a scatter of flaked stone artifacts; rockshelters; pit house sites that reflect longer terms of residence; trails; tool stone quarries; graves; rock art including pictographs or petroglyphs; and rock cairns (stacked rock features) typically associated with Native American religious activities. Historic archeological resources are characterized by wooden or stone cabins used for residence for ranching, farming, or mining; barns or other ranching structures such as line shacks and corrals; rock walls or other rock features associated with ranching, mining or farming activities; fence lines; trails; graves; and mining related features such as lode mines as well as hydraulic mining cutbanks, ditches, tailing piles, shafts, or adits.

This diverse group of sites represent the last 12,000 years of history for this region. They reflect intensive Native American occupation and use; segments of the Nez Perce National Historic Trail; segments of the Lewis and Clark National Historic Trail; intensive mining along the

Salmon and Snake River corridors, Elk City, and Marshall Mountain mining Districts; and widespread homesteading including both farming and ranching. Some individual archeological sites are considered eligible to the National Register of Historic Places. Many of the archeological sites along the Lower Salmon River are listed on the National Register of Historic Places as the Lower Salmon River Archeological District. A portion of the Snake River is listed on the National Register of Historic Places as the Nez Perce Snake River Archaeological District. However, intensive Class III inventories have not been conducted across the entire analysis area to identify all cultural resources.

3.2.9 Human Health/Recreation Use

Elements of human health potentially impacted by the action or alternatives include exposure to herbicides and exposure to poisonous or injurious plants. Two categories of human receptors are generally utilized to represent the risk from herbicides. Occupational receptors include workers that mix, load, and apply herbicides and operate transport vehicles. Public receptors include those members of the public most likely to come into contact with applied herbicides. Public receptors include individuals that may be hunting, hiking, camping, or gathering wild foods and materials such as berries.

Numerous plants on the noxious weed list show some level of toxicity to humans. This impact could be a result of the plant being toxic if ingested, the plant having sap that can negatively impact the eyes or cause dermatitis if it comes in contact with the skin, or the plant having spines or other plant parts that can physically injure humans. Plants on the noxious weed list which are toxic to humans through some mechanism include black henbane, silverleaf nightshade, toothed spurge, Scotch broom, tansy ragwort, white bryony, giant hogweed, and poison hemlock. Poison ivy, a plant native to the CFO can cause skin rash if people brush the plant with bare skin. The presence of this plant in highly used recreation areas is not desirable. Yellow starthistle and the various thistles all have thorns on the flowerheads which can puncture skin. In CFO changes in trails and recreational use patterns have been observed where these plants become established. Plants such as puncturevine and long-spined sandbur have thorns on the seeds. These plants are particularly troublesome in campgrounds and along river recreation sites as they become lodged in or puncture bike tires, rafts, and feet. Many complaints about these plants from recreation users are received. In addition to causing physical discomfort and impacting recreational equipment these seeds find a mechanism of transport in recreational users. Seeds become embedded in vehicle tires, camping gear, and animals of recreationists and find their way to additional areas potentially far distances from their origin.

4 ENVIRONMENTAL EFFECTS

This chapter discusses the environmental consequences of implementing the proposed action or alternatives, as described in Chapter 2. For each alternative, the direct, indirect and cumulative effects are analyzed for the resource topics presented in Chapter 3.

Introduction and Assumptions for Effects Analysis

Under the NEPA, actions that could affect the quality of the human environment must be disclosed and analyzed in terms of direct and indirect impacts, whether beneficial or adverse, as well as short and long term and cumulative effects. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by an action and occur later or farther away from the resource but are still reasonably foreseeable. Beneficial impacts are those that involve a positive change in the condition or appearance of a resource or a change that moves the resource toward a desired condition. Adverse impacts involve a change that moves the resource away from a desired condition or detracts from its appearance or condition. Cumulative impacts are the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

The study area is comprised primarily of public land managed by the FS (62%) then private land (29%) which includes private forests, rangelands, and lands under agricultural production. Lands managed by the CFO of the BLM make up 1.4% of the acreage in the administrative area. Although BLM does not have authority to regulate activities on lands that it does not administer, actions occurring on BLM managed lands can cause direct, indirect, or cumulative effects on lands adjacent to the BLM. Conversely, actions on lands not managed by BLM may also affect the lands managed by BLM.

Certain assumptions are being made for analysis for all alternatives. Due to the fact that almost the entire FO is located in watersheds that contain habitat for ESA listed fish species, BLM recognizes that hazards associated with herbicide use exist for these species. Low aquatic hazard herbicide and adjuvant formulations are utilized in close proximity to these sensitive habitats.

Aerial spraying poses a drift risk to the same aquatic habitats noted above as well as terrestrial habitat for ESA listed plants. CFO acknowledges that with the proposed program of aerial spraying some deposition of herbicide may occur within sensitive aquatic and terrestrial habitats. CFO has worked with NMFS and FWS on its aerial spraying program and conducted risk assessments for this activity as part of the biological assessment (BA) for the program. Specifics of this analysis will be discussed later in the document.

4.1 Special Designation Areas

4.1.1 Proposed Action

Direct and Indirect Effects

The proposed action gives managers in the CFO the tools necessary to continue to protect values for which ACECs were established. In most cases unique native vegetation is the reason for designation and invasive species are threatening those values. One example is the invasion of the Long Gulch ACEC, which was designated to protect a federally listed threatened plant, by yellow starthistle, rush skeletonweed, and dalmation toadflax. Management options allowed by the proposed action include activities to prevent spread of noxious weeds, implementation of organized planning efforts across boundaries to limit spread of existing weeds, opportunities to promote healthy, competitive plant communities through revegetation efforts and if weeds become established effective ways to treat them. Weed control undertaken within these areas must be carefully designed so as not to impair the unique values for which the area was designated. Adherence to SOP and mitigation measures relating to special designation areas further assures these values are protected. This alternative does not include herbicide AIs used for aquatic weed control such as fluridone and diquat. Should some component of aquatic weed control be required to treat aquatic weeds such as Eurasian watermilfoil, in a specially designated area, this alternative would not allow for that use and additional NEPA analysis would need to be undertaken to address the issue.

By adhering to the BLM Interim Management Policy for lands under wilderness review, short-term adverse effects to WSAs from weed treatment are expected to be minimal. This policy states that weeds may be controlled by manual or chemical treatments when they threaten lands outside wilderness or are spreading within the wilderness, provided the control can be effected without serious impacts on wilderness value. Weed treatments within WSAs would provide long term benefits to wilderness values and “naturalness” by maintaining and restoring healthy native vegetation communities and reducing impacts associated with invasion of the area by non-native vegetation. Biological treatments would have minimal impacts on wilderness values, as host-specific agents approved by APHIS would be used that only target the non-native invasive plants.

Should control of invasive species become an action considered in the portion of the Frank Church River of No Return Wilderness located upon BLM lands in the Marshall Mountain area, the proposed action allows for manual methods of control which would be the first consideration for the minimum tool necessary to address the threat to native vegetation. SOP measures from the PEIS specifically address weed control measures in Wilderness and other special management areas. The proposed action is in full compliance with this guidance.

The proposed action is not expected to impact Wild and Scenic River designation values.

Cumulative Effects

In relation to special management areas, for all alternatives the general geographic scope for cumulative effects discussion is the FO area. Most of the impact caused by invasive species have occurred in the Salmon River watershed downriver from Riggins, the Clearwater drainage downstream from Kooskia, the South Fork Clearwater drainage around Elk City, and the Snake River drainage from Pittsburg Landing downstream. The timeframe for cumulative effects analysis is being set at twenty years in the past and ten years into the future, although invasive species have been impacting native plant communities since before this time. Past actions related to special management areas revolve around the failure to adequately comprehend the impacts noxious weeds and invasive species would have on special management areas, particularly those that were designated because of some native plant value. If landowners, researchers and other stakeholders had been able to understand how much of the CFO could be dominated by invasive plants, they may have been prompted to enter into cooperative efforts and implement IWM activities at a time when weed populations, currently well established, could have been eradicated effectively or at least reduced in size. Weed control efforts did take place but in many instances complete projects could not be implemented because some landowners did not participate in the projects, plus the lack of complete inventories did not make the most effective use of limited resources. This incomplete treatment left holes in the management strategies and reduced their effectiveness. This failure to adequately recognize weed threats and respond accordingly is apparent in the case of the Long Gulch ACEC. BLM implemented a one-quarter mile aerial herbicide application buffer around and prohibited the use of herbicides within a population of MacFarlane's four-o'clock. No strategy for weed control within the ESA listed plant population was developed or implemented resulting in weed competition adequate to reduce the vigor of the four-o'clock. This also resulted in friction with cooperators as they were expending a large amount of resources to eradicate yellow starthistle from adjacent private lands. The result was BLM having a weed infested ESA listed plant site located in a yellow starthistle free management zone for the WMA.

Since about 1994 and presently, the CFO and cooperators have benefitted from support at the National, State and local level to implement IWM. This cooperation and the funding leveraged because of it, has allowed for great strides to be made in recognizing the value of all IWM strategies and has helped cooperators implement all components. Leveraging money, expertise, labor, and skills from this broad base of support has allowed for the eradication of numerous weed sites and actually reduced the inventoried acreage of Russian knapweed and other weeds. Technology improvement in inventory techniques such as digital aerial sketch mapping have led to more complete and accurate weed inventories so effective weed management activities can be designed. The importance of biological control has led to additional funding for research into new biological control agents and assessment of current agents. Realization of the role revegetation can play in establishing competitive plant communities that can resist weed invasion was the impetus to utilize this IWM strategy to break the cycle of weed control. Cooperators also recognize how prevention can be a simple way to reduce the potential of weed establishment resulting from management activities plus they have undertaken education activities internally and with the public that results in weed prevention by stakeholders.

The proposed action would continue to reduce negative cumulative impacts resulting from additional weed spread in the foreseeable future as management flexibility exists to respond to future threats from invasive weeds. It also provides flexibility in treatment methods and application methods to respond to specific weed threats while reducing the potential impact of those treatments in special management areas through adoption of SOPs and mitigation measures designed to protect sensitive resources. By working with local cooperators in WMAs to prevent weed establishment, the impact of new weed species is likely to be less than if no management were exercised. These cooperative efforts also have a better chance at successfully reducing weed spread verses the lack of cooperative management that previously existed.

Because the proposed action provides a variety of tools to address weed populations, it allows flexibility of management. The ability of managers to implement biological control in sensitive areas or places where long-term weed populations exist can reduce the potential for negative cumulative effects from continued use of one type of herbicide as the sole management method.

Examples of this type of cumulative effect could be development of herbicide resistant weeds or the reduction of native forb components in the plant community over a wide area. The ability for managers to adapt control tools to the specific situation results in balancing of values in special management areas.

The proposed action would be less effective than alternative 1 if aquatic weed species become a management issue in special management areas as most herbicide tools that would be utilized in aquatic weed management are not proposed for use.

4.1.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect Effects

Effects of this alternative are the same as in the proposed action in relation to special management areas as they are mostly upland revegetation situations. There is a chance that weed control in aquatic environments could be needed during the life of this EA. Should this need come to realization, Alternative 1 would allow the herbicide AI tools necessary to implement this control effort. This alternative would allow greater flexibility in implementing weed control around newly planted conifers. The AI hexazinone is available for use in this alternative and would be the tool of choice should conifer trees be planted as part of a reforestation effort in special designation areas.

Cumulative Effects

Cumulative effects would be the same as the proposed action. There may be a slightly improved potential for successful future treatment of aquatic weeds.

4.1.3 Alternative 2 – No Aerial Application

Direct and Indirect Effects

Effects of this alternative closely mirror those in the proposed action except for the flexibility in management options for weed treatments. Lands in the CFO are characterized by steep topography. Many special designation areas are remote as well. Aerial herbicide application is the only application method that allows large weed populations to be treated in the remote topography found in the CFO. In many ACECs aerial application is not likely to occur due to sensitive vegetative resources so the lack of this tool would not directly impact weed management within those areas. Aerial weed control is currently taking place in lands located in the Lower Salmon River ACEC and Upper Salmon River ACEC in coordinated efforts with adjacent private landowners. These efforts would no longer take place and equivalent acres of chemical weed treatment could not be accomplished with other application methods in this topography. Alternative 2 would directly impact ongoing control strategies not only in these ACECs but adjoining private lands. The lack of aerial application of herbicides would have an indirect impact on all ACECs because management of existing weed populations would not be as effective resulting in a higher potential for weed spread into ACECs.

Cumulative Effects

Past and present cumulative effects would be the same as the proposed action. This alternative would differ dramatically in the future protection of values associated with special management areas. Approximately one-half of the annual acreage of herbicide treatment occurs through aerial methods, so it can be assumed that at least one-half of the potential future weed treatment per year would not be accomplished under this alternative. Aerial treatment is used mostly in large weed populations that have the greatest potential for annual expansion and in remote areas that would not be treated by other means. In addition, BLMs scattered land pattern means cooperators would not be able to implement complete weed control across all ownerships essentially rendering the management strategies ineffective. Weeds would expand at much higher rates from uncontrolled acreages than in all other alternatives except Alternative 3. It is expected this alternative would result in a higher level of weed infestation in special management areas in the future. This alternative would be more effective in long term protection of special management areas than Alternative 3 because some herbicide treatment by non-aerial methods could be accomplished. This may allow some treatment objectives to be reached in specific portions of some special management areas.

4.1.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

Effects arising from elements common to all alternatives would be similar to the proposed action, alternative 1, and alternative 2. This alternative would be much less effective in treatment of existing weed populations and those which would become established in the future. Invasive species populations are currently impacting values for which ACECs have been established, particularly those for which unique vegetative characteristics are the reason for designation. Remoteness and steep topography are a common factor in all ACECs. Mechanical weed treatment methods could not be implemented in the type of terrain existing on most acreage of the special designation areas. The only treatment that could be implemented in these areas would be manual. Manual methods such as hand pulling of weeds would do little to provide effective weed control over the types of weed acreage already occurring within these areas. Additional discussion relevant to the effectiveness of this alternative in relation to vegetation treatment will occur later in the vegetation section of the document.

Cumulative Effects

Past and present cumulative effects of this alternative in relation to special management areas would be the same as the other alternatives. Reasonably foreseeable future effects would be more similar to those shown in Alternative 2 – *no aerial application* in the rate of future weed spread into special management areas. As native vegetation components are a factor in designation of most special management areas in the CFO, this alternative is the least effective in preventing negative future cumulative impacts to those values. Restricting available treatment tools reduces BLMs flexibility and ability to react appropriately to weed invasion.

4.1.5 Alternative 4 – No Action

Direct and Indirect Effects

Impacts of this alternative are very similar to the proposed action. This alternative does not include the use of imazapic which would be used primarily as a treatment tool against leafy spurge and annual grasses. This AI tool is a valuable addition to our management of annual bromes and situations may exist where treatment of these weeds would be focused to protect valuable native plant communities such as those that exist in many ACECs. AIs used to target aquatic weed species are not available in this alternative. This alternative would allow for the use of hexazinone and would therefore be similar to alternative 1 – 18 AI's in relation to weed control in reforestation efforts.

Cumulative Effects

Cumulative effects for this alternative would be slightly different than the proposed action because this alternative would be less effective in the control of annual grasses because imazapic would not be available for use. The cumulative effects other than annual grass control would be the same as the proposed action.

4.2 Vegetation

4.2.1 Proposed Action

Direct and Indirect Effects

Invasive Weeds

Priority based management and measures such as prevention, revegetation, inventory and monitoring which are set out as elements common to all alternatives are all proactive steps in invasive weed management. Prevention of weed spread through consideration of management actions and how to best avoid opportunities for expansion of weed populations or introduction of new weeds is a primary effort. Weed management that targets in priority order new invaders for eradication, and then as resources allow, containment and prevention of further spread of already established infestations has allowed for the best use of limited resources. The AIs listed in this alternative are ones that would likely be used in the field office and provide a good range of options for treatment of the existing weed species and those currently threatening the CFO. This flexibility in AIs gives managers enough tools to prevent the development of weed resistance, allows for residual control and provides for the most effective herbicide to treat a particular weed species. Diquat and fluridone are AIs used in aquatic weed treatment. CFO currently does engage in treatment of aquatic weeds. Hexazinone and triclopyr are herbicides used for forest revegetation treatments. Hexazinone has been used by the CFO in the past to control unwanted vegetation around seedlings planted as part of reforestation efforts. The use of the herbicide increases the survival of seedlings. Reforestation considered as part of a forest management activity along with the need for hexazinone to control unwanted competition around the seedlings can be analyzed as part of the NEPA document for the forest management project. Therefore, hexazinone use will not be included in this analysis. Bromacil and diuron are non-selective, broad-spectrum AIs that are used in situations requiring removal of all vegetation. These tools could be used in camp grounds, well pads and parking areas where complete removal of vegetation would be a benefit in fire prevention. At this point, CFO does not have particular need of these herbicides. Tebuthiuron is used in shrub thinning and CFO does not have immediate need for diflufenzopyr use. The absence of these AIs would not impact the effectiveness of herbicide treatment tools in the FO.

Along with a variety of herbicide AIs, this alternative provides a wide range of application methods which would allow for the flexibility to work with adjoining landowners in seamless, cooperative projects which implement weed control objectives across ownership boundaries. Aerial application accounts for approximately one-half of the average treatment acres accomplished in the field office. The aerial treatment accomplished in the CFO is normally part of a focused effort to control expansion of weed species by all landowners and protect uninfested acreages. Use of aerial application techniques on BLM lands allows completion of the projects in the most effective manner. In some areas, aerial application would be the only application method that would be practical. These situations exist mainly due to inaccessibility to BLM due to no legal access, the area being so remote that application by ground based methods would be inefficient and there would be safety concerns for ground based applicators. Some areas of the CFO are only accessible by walking through extremely steep areas or the weed site itself being on a steep slope. The safety hazard to applicators from operating in these areas with backpack sprayers at times limits our ability to achieve treatment objectives.

Biological control agents have been utilized in the CFO weed control program for yellow starthistle since 1986 when the first biological control insect, yellow starthistle bud weevil became available. Agents have been released for yellow starthistle and dalmation toadflax on CFO lands. Agents for leafy spurge and spotted knapweed have been released on private and FS lands and moved onto BLM managed lands through population expansion. In most instances, CFO has conducted yearly monitoring of yellow starthistle response to biocontrol insect releases at release sites for the first few years after each release. Monitoring includes a general assessment of attack rates from the agents utilizing ten randomly selected plants. Within three years of release, it was noted that at most sites, over ninety percent of all yellow starthistle flowers sustained some kind of biocontrol attack. Attacked flowers may have still produced some seed, but rates of attack were impacting seed production. Data from two release sites are displayed below.

Table 4-1. Insect Attack Rates at Two CFO Biocontrol Release Study Sites

North Bench Eustenopus # 1, 1999 release			
Year	**Total Buds**	**Total Buds Attacked**	**% attacked**
2000	127	100	78.7
2001	303	300	99.0
2002	293	232	79.2
2003	680	651	95.7
2004	333	327	98.2
2005	245	243	99.2
2008	439	433	98.6
North Bench Larinus # 1, 1997 release			
2001	361	358	99.2
2002	240	232	96.7
2003	768	740	96.4
2004	534	505	94.6
2005	128	126	98.4
2008	289	289	100

Still unknown was how biological control was impacting per plant seed production. In 2003 CFO personnel dissected one large yellow starthistle plant to ascertain biological control impact on seed production. The plant was able to produce 263 seeds that appeared viable. Biological control agents attacked 98% percent of the flowers (103 of 105 flowers). The two un-attacked flowers produced an average of 58 seeds each. The plant aborted 71 buds, mostly as a result of feeding by adult *Eustenopus* insects. The flowers that developed but had been attacked by biological control agents, produced an average of 4.3 seeds each.

CFO supported a research project to further quantify the impact of the yellow starthistle biological control program. This research found that during the course of the study up to 94% of flowers were attacked by biological control insects (Winston 2007). Winston also found a combination of adult and larval feeding resulted in a total maximum seed reduction of 70.9%. Winston's research also noted that completely effective control of plants such as yellow starthistle which produce abundant seed is not normally achieved through seed feeding agents. Work is being done to find agents which attack the plant through other mechanisms such as root feeding which will complement the impacts already achieved by the currently available agents. Although ample seed is still produced to retain yellow starthistle in the systems where it has become established at a higher than desired density, this reduction in seed appears to have helped reduce the invasive pressure on non-invaded native plant communities.

Biological control has proven effective in reducing density of the plants to acceptable levels for numerous weed species which occur in the CFO, including leafy spurge. Many examples of this exist with one long term (nine year) study noting black flea beetles were seen to spread over three study sites and leafy spurge stem counts declined substantially on two of the three sites (Larson 2008). At times, biological control is all that is needed to achieve management objectives for weed sites. Resource specialists in the CFO have seen areas where yellow starthistle appeared to be outcompeting native perennial grasslands prior to the introduction of biological controls for the species. The site still had a fair component of perennial grass, primarily sand dropseed. In the past five years, the sand dropseed has appeared to gain the upper hand at the site. Presumably, with the aid of biological controls suppressing yellow starthistle seed production, the perennial grasses are providing enough competition to reduce the density of the yellow starthistle (Danly 2009).

CFO is currently conducting monitoring of *Mecinus janthinus*, a biological control agent released for dalmation toadflax as part of a statewide network. This is the most recent agent released and the statewide monitoring protocol is being considered for adoption in other states due to the potential information that can be learned about the impact of the agents. 2011 will be the fifth year of monitoring.

Biological control agents are a valuable and needed component for weed control in CFO. It is economically unfeasible and physically impossible to treat all infestations of weeds through a combination of manual, mechanical or chemical methods. Biological control agents allow for a management strategy for weeds not treated through other methods and they also provide a safe and effective way to control weeds in sensitive areas such as along waterways or in proximity to sensitive plants. Integrated control is also the best way to approach weed treatment. Combining biological control and chemical control often provides synergistic effects thereby increasing control effectiveness. Weeds already stressed from insect attack, may succumb more effectively to herbicide treatment. A study of leafy spurge showed stem density was reduced more rapidly when biological control agents were combined with a fall-applied treatment of picloram and 2,4-D than when either method was used alone. The combination treatment reduced leafy spurge density three to five years earlier than the treatments alone (Lym, R.G. 2002).

Manual control methods may not be very efficient or cost-effective over large areas, but they may be useful for specific invasive species problems. In CFO, manual control is required for weed treatment in sensitive areas and may be the most effective control method for small sites of weeds which can be effectively controlled through manual means. Yearly hand pulling of annual weeds prior to seed set may be all that is needed for effective control of a newly invading weed in a sensitive plant area. Manual control is often used to chop Scotch thistle which has escaped herbicide treatment or when plant phenology is such that herbicide treatment will not arrest seed development. In general, this control method is most effective against annual or biennial species. Manual control is generally less effective in controlling perennial plants particularly when those plants have large rhizomatous root systems. Removal of extensive root systems by hand pulling, digging or grubbing is very difficult and unless all portions of the root are removed, new sprouts may emerge. Perennial weeds currently existing in the CFO with such root systems are Canada thistle, whitetop, leafy spurge, and dalmation toadflax. Repeat visits to hand pulling sites are necessary to remove sprouts and attempt to deplete the carbohydrate reserves of the remaining root system. Manual control of these species may be achieved through repeated yearly treatment if the plants are seedlings without an extensive root system or if they are located in moist sandy soil and most of the root system can be removed (Sheley 1999). Once soil moisture is depleted, pulling these types of plants only results in the removal of the stem and a small portion of the root system, as the plant generally breaks before much of the root is pulled from the soil. Spotted knapweed, a perennial species, has a taproot so hand pulling may be more successful at controlling this species, although, treatment objectives are typically not achieved by one manual control visit. Studies show that manual control of spotted knapweed by two hand pulling treatments per year only resulted in 56% control (Brown 1999). Multiple visits to a site in the course of a year are typically required for effective manual control. Cost figures sited earlier in this document from the PEIS found costs to be as low as $70 to over $200 per acre. Due to the steep topography of the CFO it is likely that hand control cannot be accomplished for less than $200 per acre. The Brown study found treatment costs of approximately $7,000 per acre per year to achieve a maximum of 56% control of spotted knapweed.

Post herbicide monitoring which is described in the monitoring section of elements common to all alternatives is reviewed to determine if the applied treatments have been effective in controlling noxious weeds. These forms allow the person conducting the review to document suggestions for the project in the future, rate the percent control of target weeds, and also document whether any non-target impacts were observed.

Upland Vegetation

Most targeted weed species are broadleaves and most herbicide AIs in the proposed action target broadleaf plants. Herbicide tools allowed in the proposed action include both selective herbicides, those which impact only broadleaves or grasses, and non-selective, such as glyphosate, which target all vegetation. The broadleaf herbicides also differ in efficacy by plant family. For example, clopyralid is very effective against thistles and the knapweeds but can safely be used around trees and most shrubs. The list of AIs in the proposed action allows BLM to, as much as possible, specifically target the weed while limiting non-target impact of desired native vegetation. Tailoring of treatment projects to avoid non-target plant impacts may be accomplished not only through selection of herbicide AI, but also through the herbicide use rate and timing of application. Monitoring of revegetation projects in the CFO utilizing a low rate of picloram in a fall application show that established broadleaf native plants such as biscuitroot, lupine, arrowleaf balsamroot, and snowberry were still present on the sites, but competing annual broadleaves such as yellow starthistle, tumblemustard, Scotch thistle and fiddleneck were adequately controlled. At a higher rate of application, picloram would be likely to remove the desired native perennial forbs from the community. Timing of application can also be used to limit impacts to non-target native vegetation. In some instances, herbicide application may be timed to avoid desired native plants while impacting the target species. CFO has utilized this timing effectively in fall treatments of winter annual species such as yellow starthistle and annual bromes with glyphosate while avoiding damage to desirable perennial species. Another example of this treatment timing would be late season treatment of Scotch thistle rosettes or rush skeletonweed when they have greened up but native forbs are for the most part dormant.

Design criteria for projects to avoid direct negative impacting of desired native species can also be accomplished through selection of application method for herbicides. Ground based application by spot spraying can be quite selective. CFO applicators regularly use blue dye in the spray mixture that helps the applicator to direct spray accurately, avoiding overspray or application to adjacent non-target vegetation. A majority of the ground based acreage in the field office is spot spraying in order to target weeds and, to the extent possible, reduce non-target impacts. Broadcast application either by aerial or ground based method is less selective but increases the efficiency of treatment over large infestations. A typical ground based broadcast application would be glyphosate treatment to reduce annual grass and weed competition prior to a revegetation treatment. Ground based broadcast treatment is also used along roadsides with a broadleaf herbicide as a prevention measure to assure weed seeds and plant parts are not transported on vehicles or treatment of a larger area completely dominated by invasive plants. Aerial treatment is generally reserved for larger infestations not treatable by ground based methods and as part of a management strategy implemented along with cooperators to reduce the acreage of a particular weed population and to stop the spread of the infestation into additional acres.

SOPs, mitigation measures, and project design can decrease the potential impact to non-target native vegetation from herbicide application. Even so, there would be negative impacts from herbicide application to non-target desired native vegetation in project areas resulting from direct spraying of herbicides. Herbicides in the proposed action would, when applied at typical application rates, control susceptible desired native vegetation in a project area along with the target weed. The potential for these non-target impacts to native vegetation is highest with broadcast application. Monitoring of the impacts that applications have had to non-target species by cooperators has led to changes in herbicide AIs and rates used in broadcast application. As discussed above, large rooted native perennial forbs can tolerate lower rates of picloram particularly if the timing of application avoids the period when they are actively growing. Broadcast herbicide operations, particularly aerial application, has moved toward only applying picloram at lower rates that still achieve management objectives (0.375 lb ai/acre) instead of higher labeled rates (0.5 lb ai/acre) or mixes of picloram and 2,4-D which can increase damage to non-target species. Timing of treatment is also planned as late in the spring as possible to allow effective treatment of yellow starthistle but avoidance of the period when many desirable natives are actively growing. Even with measures to avoid non-target impacts, broadcast herbicide use would impact susceptible non-target plants and some species would be removed from the plant community. Some projects where the target weed can only be controlled by broader spectrum herbicide mix or where priority for control warrants higher rates of herbicide will still occur on a limited basis. These projects have a higher risk for non-target impacts. The undesirable reduction of non-target native forbs in herbicide project areas must be weighed against the undesirable reduction of native plant diversity that has been demonstrated through monitoring over time in native plant communities invaded by noxious weeds. In contrast to selective broadleaf herbicide application typically used in the CFO, long-term monitoring studies (Rattlesnake Ridge) have shown that weed invasion tends to be non-selective, reducing both native forbs and grasses on an invaded site. Another factor that must be considered is the potential for keeping invasive species from infesting additional acres of good condition native plant communities, thereby maintaining native plant biodiversity and abundance over larger acreages through effectively implemented IWM projects. The end result of allowing noxious weeds to spread unchecked is likely to be more extensive and impact a larger acreage of native plant communities than implementing effective weed control through herbicides as part of the proposed action.

Herbicide application poses a risk to non-target vegetation indirectly through drift. This risk is highly variable based upon factors such as application rate, wind at the time of application, whether drift control agents were added to the spray mixture, height of the boom, and whether the non-target plant is sensitive to the herbicide at the diluted rate drifting to the plant. Included in the SOPs and mitigation measures adopted from the PEIS are actions that can reduce the risk of off-site herbicide movement through drift. Extensive modeling was conducted in the PEIS in an attempt to quantify the relative risk herbicides pose to desirable vegetation from drift. This risk data can be found in the PEIS at Table 4-11 and 4-13. Drift from ground based application may occur but even the risk to sensitive plants from herbicide application at typical rates was not high for most herbicides included in the proposed action. Dicamba and sulfometuron methyl are the only herbicides that pose a high risk to sensitive plants at typical application rates. Yearly acreage sprayed with dicamba in the CFO has been minimal and usually is a focused project on a problem weed such as dalmation toadflax. Sulfumeturon methyl is currently not approved for use on BLM managed lands in Idaho. If sulfumeturon methyl is approved for use in Idaho, it is likely to be used along roadsides to control downy brome in the FO. Post project monitoring is conducted on most herbicide projects in the CFO. Individuals conducting the monitoring are instructed to review the site for non-target impacts which occurred to plants outside the project area. Non-target impacts sufficient in effect to kill desired vegetation outside the target area have not been observed as a result of ground based spot or broadcast application. Most evident with broadcast spraying from ATV or vehicle mounted sprayers is a distinct line where the application rate was sufficient to impact target species on one side and where the herbicide rate was not sufficient on the other. With a properly executed project utilizing relevant SOPs, the line between sufficient impact and no noted impact is no more than a couple of feet in width, often less. Training of applicators in proper calibration and safe application practices is conducted yearly to educate employees on how to conduct an effective weed treatment project while avoiding non-target vegetation impacts by both direct spray and off site drift scenarios. Supervision and post project monitoring of CFO projects reveals that herbicide application projects are being conducted in a way to avoid application scenarios in which drift would be likely. Although drift may occur, the actual impact to non-target plants from drift is again variable. In order for a plant to be impacted by the herbicide, the plant must receive a high enough dose to elicit an effect. Herbicide applications are made with the intent of delivering a dose of herbicide active ingredient sufficient to impact the target via direct spray as indicated on the product label. As a spray solution moves off target via drift, the dose is reduced substantially. As the dose reduces, the impact to the plant and likelihood of unacceptable impact is also reduced.

The PEIS also modeled risk to non-target plants from off-site drift during aerial application. Picloram, 2, 4-D and metsulfuron methyl are herbicides which have been aerially applied in the CFO. Dicamba is not typically aerially sprayed, but in 2007 a project targeting whitetop was conducted and dicamba was part of a tank mix used. Again, at typical application rates, only dicamba rated as high risk to sensitive plants although it rated as moderate risk for non-sensitive terrestrial plants. Aerial application projects are also monitored for off-site drift. In the CFO buffers of 100 to 300 feet have been utilized next to sensitive areas such as streams or ESA listed plants. The more sensitive the resource, the larger the buffer was used. Monitoring with spray cards has been accomplished and these buffers have been adequate to protect the resources of concern. Monitoring of aerial spraying projects has shown that the amount of drift occurring on a typical project is not resulting in a dosage application outside buffer distances that result in the death or substantial impact of susceptible, non-target vegetation. Within the buffer zones, some short-term impact may occur to non-target plants such as reduction in viable seed production and reduced vigor. Established plants often recover from these low dose herbicide effects. There may be removal of seedlings as these young plants can be impacted with lower doses of herbicide.

Risk to desired native vegetation from release of approved biological control agents is highly unlikely. Before agents are approved for release, they must pass stringent testing to assure the agent is host specific. Agents are presented a variety of plants related to the target weed including common food crops and closely related plant taxa native to the area the agent will be released. These “starvation tests” prove insects are highly host specific and not likely to impact non-target species. In effect they cannot complete their lifecycle without being highly dependent upon the target host plant. Only agents approved for release by USDA-APHIS will be considered for use in the CFO. Early biological control efforts resulted in an often referenced example of a biological control agent impacting non-target native species. An agent released for exotic thistle control was a generalist and fed on many species of thistle, such as Scotch and Musk. In this instance the agent did impact native thistle species. This agent would not be approved for release under today’s protocols. There are no reports of concern regarding non-target impacts from biological control agents currently being used in the CFO.

Manual control through clipping can be one of the most selective treatments and result in the least impact to non-target vegetation. Manual treatment through weed whacking can be less selective and result in impact to non-target vegetation. Damage to non-target plants can also occur by accessing sites on steep slopes to conduct manual treatments such as hand pulling. On steep slopes soil and therefore rooted plants can be dislodged by individuals walking in these areas to conduct treatments. In addition hand pulling of plants causes localized soil disturbance not seen in herbicide or biological control methods and may result in opening sites for further colonization by invasive plants. The acreage of manual treatments is small and therefore would be a minimal impact.

Riparian Vegetation

Invasive plants displace native plants in riparian areas and have the potential to destabilize streams. Riparian areas impacted by invasive species have reduced quality of fish and aquatic habitats. Invasive plants found growing adjacent to or within aquatic influence areas can invade, occupy, and dominate riparian areas and indirectly impact aquatic ecosystems and fish habitat. Invasive plants can change stand structure and alter future inputs of wood and leaves that provide the basic foundation of the aquatic ecosystem food webs. Native vegetation growth may change as a result of infestation and the type and quality of litter fall and quality of organic matter may decline, which can alter or degrade habitat for aquatic organisms.

A successful integrated weed management program would benefit wetland and riparian communities by decreasing the growth, seed production, and competitiveness of target plants, thereby releasing native species from competitive pressures and aiding in their reestablishment. The degree of benefit would depend on the success of the treatments over both the short and long term (BLM 2007b). Unintentional herbicide applications or accidental spills near wetland and riparian areas could be particularly damaging to wetland and riparian vegetation. Spray drift could damage non-target riparian vegetation (BLM 2007a). SOPs and mitigation measures would minimize impacts to native riparian vegetation. These would also minimize the possibility of accidental contamination of water bodies by herbicide due to runoff, drift, misapplication/spills, and leaching. Using appropriate methods to reduce the spread or density of weed populations would ensure stream functions are not impacted by weed species. The proposed action alternative would increase the range of herbicides available to BLM managers and the ability to use additional herbicides as they become registered with the EPA. This would allow more options in choosing herbicides to match treatment goals and application conditions. It is likely that newly approved herbicides would pose less risk to the environment. These herbicides could be selected for use in wetlands and riparian areas, thereby minimizing potential negative impacts.

Over both the short and long-term, proposed weed treatments would allow for soil stabilization and recovery of native vegetation, especially native riparian vegetation such as rushes, sedges, cottonwoods, and willows. Maintenance or improvement of riparian habitat would provide long-term large woody debris recruitment potential and provide stable fish habitat over time.

Herbicides used for aquatic invasive plant control have been shown to affect aquatic ecosystem components; however, concentrations of herbicides coming in contact with water following land-based treatments are unlikely to be great enough to cause such changes (Norris et al. 1991).

Drift from herbicides used on terrestrial vegetation may affect aquatic vegetation at low concentrations; however, they show little tendency to bioaccummulate and are likely to be rapidly excreted by organisms as exposure decreases (Norris et al. 1991). Therefore, while the herbicides considered for use in this project may kill individual aquatic plants, aquatic habitats and the food chain would not be adversely impacted because the amount of herbicide that could be delivered is relatively low in comparison with levels of concern from herbicide risk assessments (BLM 2011) and the duration to which any nontarget organism (including aquatic plants) would be exposed is very short-lived and impacts to aquatic plants would be very localized.

Impacts to wetland and riparian vegetation from manual and biological (insect or pathogen) treatments should be minor and short-term, with rapid recovery of non-target vegetation.

Federally Listed and BLM Sensitive Plants

As mentioned previously, invasive species are currently impacting federally listed plants and are listed as reasons for the decline of both MacFarlane's four-o'clock and Spalding's catchfly. The proposed action provides a good range of tools to address not only direct impact of weeds within federally listed plant populations, but the indirect impact of weed spread into currently non-infested populations. The CFO is working with the FWS to formulate the best plan to reduce weed impacts to these plants effectively with the least impact from treatment methods. Even so, direct and indirect impact from herbicides and manual control cannot be totally eliminated.

The PEIS contains buffers for the specific herbicides which reflect the smallest modeled distance that reflected "no risk" to non-target vegetation. CFO is proposing ground based and aerial application of herbicides around listed plant populations within many of these buffers. The CFO is currently in consultation with the FWS concerning these two federally listed plants and is seeking a *"May affect, likely to adversely affect"* determination along with a biological opinion. Herbicide treatment near ESA listed plants has the potential to impact plants through accidental direct spraying of the plant or drift from application in close proximity. Hand pulling around plants has the potential for direct impact as a result of close weeding around the plant dislodging stems, or indirect impacts from soil disturbance caused by the control action, or soil erosion caused by individuals moving around plants on steep slopes. Potential impacts from herbicide application, manual, and biological control to ESA listed plants are the same as those already discussed in the upland vegetation section above. Various buffers specifying type of control allowed within proximity to listed plants reduces the potential for impacts of high enough magnitude to kill listed plants. It is expected that control measures may cause some level of impact to plants. Monitoring has shown that ESA listed plant vigor and health is being impacted by weed competition. The intention is to reduce this competition through weed control with the least possible impact to plants as a result of the control action. Carefully planned and executed control actions should benefit the ESA listed species long-term population health.

Herbicide treatments within whitebark pine habitats are expected to be very limited and would include selective spot treatments of weedy species primarily along roads or disturbed areas. Discountable impact to individual trees or to habitat for the tree is anticipated to occur from implementation of the proposed action. A "*no impact*" determination was concluded for whitebark pine.

BLM sensitive plants include many which occur in Palouse Prairie plant communities and canyon grasslands. Impacts to these plants will be the same as those discussed in the upland vegetation section above. Because herbicides target specific plants, should a BLM sensitive plant be located within a herbicide treatment area and the herbicide being used was effective in impacting the plant it could be killed. Therefore, for all BLM sensitive plant species the proposed action *"may impact individuals but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species"*

Cumulative Effects

Past, present and reasonably foreseeable actions and resultant cumulative effects of the proposed action as discussed in Special Designation Areas above is relevant here as native plant communities were the reason for designation for many of them. The same geographic extent and timeframes for analysis also apply. These components of cumulative effects will not be reiterated here as they were adequately discussed above.

In relation to invasive weeds, past lack of coordinated management has contributed to their spread. Without adequate measures to stop their spread, the weeds have been able to expand unchecked into many areas.

Strategies presently being employed to manage the existing noxious weed situation appear to be the best way to implement IWM at the landscape level with partners given the current situation. The proposed action gives managers the appropriate tools to be able to respond to changing needs and new situations as they arise while providing adequate safeguards through the SOPs and mitigating measures to protect sensitive resources. The amount of weed treatment taking place on BLM is minor in comparison to rangeland weed control being conducted on other ownerships. For example, four percent of total treatment acres occurred on BLM lands in the Salmon River and Joseph Plains WMAs in 2007. Although, without the BLM participating in larger projects, the management strategies aimed at reducing weed spread would not be as effective. Not being able to treat weeds on BLM lands could leave holes in containment lines or would leave weed populations on BLM lands untreated and provide weed seed sources to re-infest private or other lands.

Reasonably foreseeable cumulative impacts in relation to invasive species are generally beneficial for the goal of reducing weed spread. Components of the proposed action, if consistently implemented in coordination with other landowners, are likely to reduce weed spread into non-infested areas, continue to locate new weed infestations through inventory and allow adequate tools to eradicate them. Weeds would still exist on the landscape, but management strategies found in the proposed action are the most likely to prevent further establishment and spread. Through the use of biological controls cooperators may even be able to reduce the density of weeds in infested areas to acceptable levels.

Cumulative impacts to native vegetation from the proposed action are generally beneficial for non-infested areas as properly implemented strategies should reduce the chance that they would become infested with noxious weeds. Overall cumulative impacts to native plant communities already infested with weeds could be one of two outcomes. If not treated, over time, the overall health of these plant communities would continue to decline due to invasive species competition. As discussed in the affected environment vegetation section (3.2.2), long-term rangeland monitoring in the CFO has documented a decline not only of native forb species but of native grass species in upland areas where annual bromes and yellow starthistle have been a vegetative component for over ten years. Due to limited funding and the fact that many of the areas which have already been infested for a number of years do not warrant high priority for treatment, it is possible the native plant health would continue to decline on these sites unless effective biological control becomes available that reduce the competitive advantage of these plants. A second, more favorable outcome may occur on areas with a higher component of native species or areas that rank higher in priority for treatment. Treatment by herbicides may remove a component of the native forbs, but reduced invasive competition may allow for native grass species to increase in vigor and remain in the plant community. In some areas where weed infestations are scattered, spot treatments may be enough to reduce the expansion and convergence of weed infestations. Because spot treatments of herbicide would not impact a widespread area, adequate native forbs may exist to provide seed and recruitment into treated areas and provide for the reestablishment of forb components removed through herbicide treatment.

Federally Listed Plants

Federally listed plants located on private lands are not afforded ESA protections. The primary use of the private lands where ESA listed plants are located is livestock grazing. Since noxious weed invasion reduces the economic value of the lands for grazing use, herbicide use to curtail weed invasion has occurred in the past, and is likely to occur presently and into the future. On private lands this herbicide application is occurring in populations of ESA listed plants. Monitoring has occurred in a few populations of four-o'clock on private lands and has shown that repeated herbicide use is resulting in the reduction of individuals in those populations. MacFarlane's is apparently somewhat resistant to herbicides commonly used to combat noxious weeds in the area as plants are surviving direct herbicide application. Over time, it is expected that herbicide use on private lands is likely to reduce the number of individuals in populations on private lands or even remove some populations entirely. Less is known about Spalding's catchfly. Since listing in 2001, surveys have shown this plant to be fairly widespread in the CFO planning area. This plant occurs in plant community populations more resistant to yellow starthistle and cheatgrass invasion so is not as likely to be located where a majority of the noxious weed control would be occurring. The plant is located in areas where weed control is targeting weeds for eradication. Two populations are infested with leafy spurge which is proving difficult to control.

As discussed in the Special Designation Areas cumulative effects section there are past and present impacts to federally listed plants from invasive weed encroachment. This is most evident for four-o'clock. An example is the Long Gulch population which is currently infested with yellow starthistle, annual bromes, and to a lesser extent, dalmation toadflax and rush skeletonweed. These plants are directly competing for space, light, water and nutrients causing a reduction in vigor to individuals within the population. The proposed action provides a broad range of tools to address this situation and would allow the CFO to respond to this existing threat. In the future, with implementation of the proposed action, it is anticipated that a majority of the habitats where catchfly is located can remain uninfested. Weeds such as whitetop, leafy spurge, spotted knapweed and perhaps rush skeletonweed may be able to compete in the catchfly habitats. If these weeds threaten catchfly populations, the proposed action allows the tools necessary to respond to each situation with a management strategy tailored to the site and situation.

Since herbicides utilized in aquatic weed management are not included in the proposed action, this alternative would be less effective in providing for control of aquatic weeds in the future.

4.2.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect Effects

This alternative provides eight additional AIs for use in the field office. Two of the AIs are for aquatic weed control, two are used mostly in forestry applications, two are broad-spectrum herbicides, one is used in shrub thinning and the other is not one currently considered for use in the CFO. All other elements are the same as in the proposed action including application methods, biological and manual tools.

Invasive Weeds

Most impact to invasive weeds with this alternative would be the same as the proposed action. Should aquatic weed treatment become a management concern, this alternative would give CFO the tools necessary to address the issue. This alternative would give CFO the opportunity to use two herbicides used mostly in forestry applications. In the case where long-term, broad spectrum control is needed such as parking areas or campground spurs, this alternative would be advantageous over the proposed action. Other than weed control in these two situations, this alternative would have no advantage over the proposed action in effectiveness in control of invasive weeds currently occurring in the FO.

Upland Vegetation

Direct and indirect effects to desired native vegetation in upland areas would be mostly the same as the proposed action as ten of the eighteen AIs are the same. Bromacil, diflufenzopyr, diuron, hexazinone, tebuthiuron, and triclopyr are additional terrestrial herbicides which could be utilized in desired native vegetation. Direct impacts of these herbicides to susceptible native vegetation would be the same as in the proposed action.

None of the additional terrestrial herbicides rate as high risk to sensitive desired native vegetation at typical application rates resulting from off-site drift through aerial or ground based application. None of the additional AIs pose any indirect risk to non-target terrestrial vegetation through drift other that what was already discussed in the proposed action.

Riparian Vegetation

Diquat and Fluridone are used in aquatic weed control so they would be used in aquatic settings and may have more potential to impact riparian vegetation. Diquat is nonselective and may be more of a concern. It is unlikely these products would be used, so it is not expected that impacts to riparian vegetation would be different than those already described in the proposed action.

Federally Listed and BLM Sensitive Plants

It is unlikely that any of the additional eight herbicides included in this proposed action would be utilized in proximity to federally listed plants so the impacts would be the same as described in the proposed action along with the same determinations. In relation to MacFarlane's four-o'clock and Spalding's catchfly, implementation of alternative one results in a "*may affect, likely to adversely affect"* determination and for whitebark pine, a "*no effect"* determination.

Hexazinone and triclopyr may be used in proximity to sensitive plants which occur in forested areas. The CFO has only utilized hexazinone in one project for reforestation in the past ten years. It is not expected that a significant increase in the use of either product would occur in the future. Sensitive plant clearances would occur prior to implementing any tree planting project so risk to sensitive species in forested environments would be minimal as SOP and mitigation measures would be implemented to avoid unacceptable impacts. As in the proposed action, sensitive plants located within a project would be impacted by herbicides if the plant were sensitive to the particular active ingredient. In relation to BLM sensitive plant species, alternative one *"may impact individuals but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species"*.

Cumulative Effects

The cumulative effects of Alternative 1 would be essentially the same as the proposed action as the only difference is in herbicide AIs. Should aquatic weed control become a future control need, this alternative would allow for control to take place and would be more effective for future efforts. Triclopyr is effective in treating Japanese knotweed and mulberry although in the FO these species typically occur close to water. This alternative would provide an additional herbicide tool should these species become treatment targets. This alternative would also provide additional herbicide tools for bare ground treatments should they become desired treatment goals in the future.

4.2.3 Alternative 2 – No Aerial Application

Direct and Indirect Effects

The impacts of Alternative 2 are the same for non-aerial herbicide application, biological control and manual control in relation to invasive weeds, desired native vegetation and federally listed and BLM sensitive plants. This alternative differs from the Proposed Action by excluding aerial application as an application method for herbicides. Discussion below will only address factors that differ from the proposed action in relation to the lack of aerial application.

Invasive Weeds

Not having the option for aerial application reduces the effectiveness of this alternative in CFOs ability to treat high priority weed infestations in remote areas or areas of steeper topography which cannot be treated effectively by other application methods. As the acres normally treated through aerial methods are not accessible by vehicles, control by backpack or in some limited areas horse-pack sprayers would not be equivalent to those which would have been treated aerially in the proposed action. Approximately one-half the yearly acreage of herbicide treatment is accomplished through aerial application in the field office. Therefore, this alternative essentially cuts the acres of weed treatment in half and leaves portions of cooperative weed projects across ownership boundaries uncompleted. The inability of CFO to complete portions of cooperative projects on BLM lands would also impact the effectiveness of management objectives for stopping weed spread beyond BLM lands.

Upland Vegetation

Given that one-half of the acreage treated in the field office is treated via aerial application, it is reasonable to assume that potential impacts to desired upland native vegetation by direct spray of herbicide would be reduced by one-half. Indirect impacts via drift from aerial application would also not occur. The benefit of reducing this indirect impact is considered to be minor. Monitoring of aerial spraying projects has shown that the amount of drift occurring on a typical project is not resulting in a dosage application adequate to result in the death of susceptible, non-target vegetation beyond established buffers.

Alternative 2 would result in a higher potential for noxious weed spread into currently uninfested acreages as complete containment lines that cross ownerships could not be accomplished without aerial spraying as an application technique.

Riparian Vegetation

There may be a slightly reduced risk to riparian vegetation as a result of drift from aerial application. This risk is likely discountable as monitoring has shown no impact to riparian habitats at levels of concern with aerial buffers such as those in the proposed action.

Federally Listed and BLM Sensitive Plants

Risks to federally listed plants would be similar to the proposed action as aerial application is not used as an application method in listed plant populations; although, the potential for indirect impact from drift of herbicides applied aerially as discussed in the proposed action would not occur. Because ground based herbicide application would still be used within listed plant populations, Alternative 2 still results in a *"may affect, likely to adversely affect"* determination for Spalding's catchfly and MacFarlane's four-o'clock. There would be minimal potential for herbicide treatment near whitebark pine so this alternative results in a "*no effect"* determination for the species.

BLM sensitive plants often occur in good condition bunchgrass communities. This alternative would be less likely to protect remaining good condition bunchgrass communities from weed spread as aerial application as part of a cooperative strategy would not be allowed. This would result in increased risk of weed spread into these areas. Ground based herbicide treatment could still occur in plant communities where BLM sensitive plants are located so this alternative *"may impact individuals but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species"*.

Cumulative Effects

Past and present effects of cumulative impacts mirror the proposed action. In relation to invasive weeds, future cumulative impacts resulting from implementation of Alternative 2 could be one of two outcomes based upon the response of cooperative partners to the lack of aerial application as a tool for BLM. Should BLM lands be located in an area where a containment line is needed, the cooperators may adjust boundaries of the line to make sure a complete treatment line is formed. This may include going around the perimeter of the BLM lands resulting in larger aerial herbicide acreages on private lands in order to complete the boundaries. If funding is not available to complete these larger containment lines, management strategies for containment of weed spread would not likely be as effective resulting in a potential increase in weed spread into un-infested acreages. In some instances aerial application is used to efficiently treat new invader weeds with the aim of eradication. Since eradication of new invaders is a top priority, not only for BLM but partners in the WMAs, additional time and financial commitments would need to be made to treat these weeds. This expenditure would result in fewer resources for other projects of lesser priority.

Utilizing the premise discussed above, native plant communities would be at more of a risk from weed invasion should cooperators not be able to accomplish weed containment lines. If cooperators increase the acreage of aerial treatment on private lands cumulative impacts from aerial treatment would actually increase over the proposed action. More total aerial acreage would be applied on private lands than would be under the Proposed Action, Alternative 1 (18 Active Ingredients List), or Alternative 4 (No Action).

Cumulative impacts of this alternative in relation to ESA listed plants could also move in two directions. If cooperators increase the acreage of private land aerial spraying in order to complete containment lines, additional listed plant populations on private lands may be impacted by herbicide application. Increased weed spread may occur if cooperators cannot adjust to the exclusion of aerial application on BLM lands. The more acres impacted by weeds, the higher the likelihood that additional listed plant populations would be directly competing with weeds for limited resources. A reduction in the health of these populations would be the result.

4.2.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

Invasive Weeds

As shown in Table 2-5 "*Treatment Comparison by Alternative",* it is estimated that a total of 60 acres of weed control per year could be accomplished through manual and mechanical means. Only the highest priority treatments could be conducted with this limited acreage. Larger acreages including containment lines around spreading weed populations would not be treated. Acres treated through manual or mechanical methods would require retreatment visits periodically through the year as re-sprouting of perennial weeds would be expected to occur and emergence of new seedlings such as puncturevine, which can sprout throughout the summer as long as adequate moisture is available. As described in the proposed action, manual treatment does not provide for effective control of some weed species, particularly perennial weeds with creeping root systems such as leafy spurge, whitetop, dalmation toadflax and Canada thistle. Manual treatment of these types of weeds is not expected to be fully successful for control. Weed sites which would be highest priority for control would be new invaders and areas where weed control would best prevent spread of weeds such as heavy use campground areas. Mowing and spin trimming combined would be the treatment method used on most acreage under this alternative. The goal of mowing treatments would be to prevent weeds from developing viable seed as this treatment does not kill existing weeds, particularly perennials. One particular weed problem in campgrounds, puncturevine, would not be effectively treated through mowing. Puncturevine is a plant with a prostrate growth form which hugs the ground. Mowing would not be effective in controlling this plant as the seeds and stems are below the level that would be cut by the mower. Hand pulling or hoeing would be used as a control method for puncturevine. Use of disking or ground disturbing type mechanical treatments would not be utilized in many areas of the field office due to concerns for archeological resources. If archeological clearances determined that disking could be accomplished, it would only be used as a site preparation for revegetation treatments. Since many weeds are promoted by disturbance, mechanical ground disturbance does not achieve long-term treatment objectives of preventing establishment of new invasive plant species and reduce infested acreage of established invasive plant species.

Although release of biological control agents is not allowed on BLM managed lands under Alternative 3, new agents would be released in the vicinity of those lands due to the active biological control programs being implemented by the WMAs. Successful agents would spread to weed populations located on BLM managed land. BLM has been able to play a leading role in WMAs in relation to the collection, release and monitoring of biological control agents in the past. CFO would still conduct monitoring of this control method to document effectiveness and make BLM lands open to collection of approved agents for release on private lands.

Alternative 3 would be the least effective in preventing spread of weeds currently located within the field office and would be unlikely to provide the tools necessary to effectively treat newly invading weeds if the population size is over a couple of acres. This alternative would be the least effective at achieving the purpose of the IWM program.

Upland Vegetation

Due to the increased spread of weeds expected if this alternative was selected over the others, currently un-infested upland native plant communities are at the highest risk of infestation not only by existing weed populations but of new weed introductions. In addition, native plant communities currently infested by existing weeds would be at risk of invasion of perennial weed species not yet widespread in the field office such as leafy spurge and rush skeletonweed. Monitoring in the CFO has shown that, over time, native plant communities invaded by yellow starthistle and annual bromes have seen a reduction in the frequency of native grass and forbs, thereby resulting in less biodiversity. It is expected that most plant communities in the CFO would be susceptible to invasion by existing or invading noxious weed species. Unchecked spread of these weeds would impact more acreage at a faster rate with selection of this alternative than any other alternative.

There would be no risk of non-target impacts due to herbicide use on BLM lands either through direct spray or drift to desired native vegetation. Landowners would be releasing biological controls on their lands surrounding those managed by BLM. Those agents would move onto BLM lands naturally. Direct release of agents would not occur, resulting in a reduced response time for agent impact.

Riparian Vegetation

This alternative does not provide the most effective tools for eradication of newly invading species using herbicides. Many species of concern to riparian areas are large stature trees or shrubs such as saltcedar, Japanese knotweed, and Russian olive that have the potential to replace or otherwise significantly alter riparian habitats. In the long-term, lack of herbicides for use in riparian areas could lead to undesirable changes in riparian habitats. As mentioned in upland vegetation, although biological controls could not be released by BLM, it is expected they would reach weed populations as they would be released by cooperators on private lands. Increases in manual control in riparian areas could increase potential for bare ground and soil disturbance impacting water quality. Mechanical treatments would not likely be used in riparian areas; although if that was the only treatment option available, its use would likely increase sediment delivery into streams, reduce the overstory, increase stream temperatures and impact spawning habitat for ESA listed fish.

Federally Listed and BLM Sensitive Plants

This alternative would be the least likely to provide the tools necessary to avoid impacts from invasive plant species in federally listed and BLM sensitive plant populations. The CFO has already seen declines in ESA listed plant population health as a result of competition from invasive species. Most ESA listed plant sites occur on steep slopes not suitable for mechanical treatment and mechanical treatment would likely have unacceptable impact to sensitive plants. Mechanical treatment would not be utilized within ESA listed populations. Hand pulling of weeds has been used around sensitive plants in the past as a control method and is prescribed in the proposed action to form a buffer around ESA listed plants. Unfortunately, with the resources at hand, it is unlikely the acres of manual treatment needed within ESA listed plant populations can be accomplished in a timely manner to elicit effective weed control. Hand pulling of weeds around sensitive plants is also not entirely without impact. Four o'clock stems are often buried within and wrapped around weeds in proximity. Hand pulling of these weeds can cause the unintended removal of the native plant stems and increases the soil erosion potential around the roots. In addition, the amount of manual labor needed for effective weed control causes trailing and disturbance within the plant population located on steep slopes. Since herbicides would not be utilized, there would not be risk from herbicide impact to ESA listed or sensitive plants. Due to the potential for continued impact to ESA listed plants from competition for resources from invasive plants and the potential for increase in soil disturbance and plant impact from manual control, Alternative 3 results in a *"may affect, likely to adversely affect"* determination for Spalding's catchfly and MacFarlane's four-o'clock. Implementation of the alternative would have "*no effect"* to whitebark pine.

BLM sensitive plants often occur in good condition bunchgrass communities. This alternative would be less likely to protect remaining good condition bunchgrass communities from weed spread as herbicide application as part of a cooperative strategy would not be allowed. There may actually be more herbicide treatment in good condition plant communities on other ownerships if this alternative were selected. Due to increased risk of weed spread into good condition plant communities where BLM listed plants may occur and increase in potential for herbicide treatment on non-BLM lands, this alternative *"may impact individuals but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species"*.

Cumulative Effects

Past and present effects of cumulative impacts mirror the proposed action. In relation to invasive weeds, future cumulative impacts resulting from implementation of Alternative 3 would differ based upon whether the land is BLM managed or not. Over time, without herbicide and biological tools, invasive species could spread unchecked into all susceptible plant communities located on BLM lands. Invasive species such as cheatgrass are already a component of most plant communities. Yellow starthistle has invaded canyon grasslands which are in relatively pristine condition and which have not been grazed by domestic livestock for over fourteen years. Therefore, it can be expected that all BLM lands may be susceptible to invasion of either existing weeds or ones that may become established in the future.

This alternative would be similar to Alternative 2 (no aerial) in relation to potential response of private landowners to reduced weed control on BLM lands. Non-BLM lands currently within one of the WMAs that may have active weed control could have one of two outcomes based upon the response of cooperative partners to the lack of active weed management by BLM. Should BLM lands be located in an area where a containment line is needed, the cooperators may adjust boundaries of the line to make sure a complete treatment line is formed. This may include going around the perimeter of the BLM lands resulting in larger aerial herbicide acreages on private lands in order to complete the boundaries. If funding is not available to complete these larger containment lines, management strategies for containment of weed spread would not likely be as effective, resulting in a potential increase in weed spread into un-infested acreages on private as well as BLM lands.

Cumulative impact of this alternative in relation to ESA listed plants would be the same as Alternative 2. If cooperators increase the acreage of private land aerial spraying in order to complete containment lines, additional listed plant populations on private lands may be impacted by herbicide application. Increased weed spread may occur if cooperators cannot adjust to the exclusion of aerial application on BLM lands. The more acres impacted by weeds, the higher the likelihood that additional listed plant populations would be directly competing with weeds for limited resources. A reduction in the health of these populations would be the result.

4.2.5 Alternative 4 – No Action

Direct and Indirect effects

Invasive Weeds

Tools available for use in this alternative are generally consistent with those in the proposed action. Therefore, impacts in relation to invasive species would generally mimic those in the proposed action. The only difference between this alternative and the proposed action are the available herbicide tools. This alternative does not include the herbicide tool imazapic, a component of the proposed action which would be used for site preparation on revegetation projects and is effective in leafy spurge control. Alternative 4 would not provide this herbicide tool for use in revegetation and would not allow flexibility in implementation of rehabilitation projects possibly resulting in less successful establishment of desired plant species in those projects. Hexazinone, triclopyr, bromacil, diuron and tebuthiuron are herbicides included in this alternative but not in the proposed action. Hexazinone and triclopyr are herbicides used in forestry applications. Bromacil and diuron may be used in bare ground treatments in parking areas or to keep vegetation removed from campground spurs. Although not used in the recent past, this alternative would allow use of these applications. Tebuthiuron has not been used in the field office and is not expected to be used in the near future. Should site preparation or post project weed control for reforestation be needed, this alternative would provide the tools for use of the forestry herbicides and would be better suited for implementing those projects. Because we are not expecting to utilize the remaining herbicides listed above, this alternative does not provide better alternatives for weed control in relation to the proposed action. In general, these herbicides are better at controlling tree or brush species. This alternative is similar to Alternative 1 (18 AI) in that it may provide herbicide tools that would target weed threats that are shrub or treelike as in the case of saltcedar, Scotch broom, or Russian olive which are not currently treatment targets in the CFO. Japanese knotweed control through the use of triclopyr is also allowed as in Alternative 1.

Application methods for herbicides are the same as the proposed action so the impacts for invasive weed control would be the same as the Proposed Action.

This alternative provides for the use of manual and biological weed control like the Proposed Action, so it mimics the proposed action for impacts to invasive weeds.

In the future, should aquatic weed control be desired in the FO, this alternative does not include the aquatic herbicides available in Alternative 1. Alternative 1 would be better in relation to aquatic weed control.

Upland Vegetation

This alternative closely mimics the proposed action in relation to effects to desired native upland vegetation due to the similarities in control methods, application methods for herbicides, and a majority of the herbicide tools being the same. If weed species are found in the field office which are controlled better by the herbicides triclopyr, tebuthiuron, or hexazinone, this alternative may be better at protecting native vegetation or plant communities being threatened by these species. This alternative may be better at protecting native plant communities if future weed threats are shrub or treelike as in the case of saltcedar, Scotch broom or Russian olive or if active treatment of mulberry is undertaken.

Riparian Vegetation

Weed management methods utilized under the no action alternative would result in impacts similar to those described for the proposed action alternative.

Federally Listed and BLM Sensitive Plants

This alternative closely mimics the Proposed Action in relation to effects on federally listed and BLM sensitive plants. Should sites be threatened by woody weed species, which are better controlled by herbicides included in this alternative but not in the proposed action, this alternative would provide the tools necessary for their control. It is not expected that known upland sites of these plants would be threatened by such species.

In relation to MacFarlane's four-o'clock and Spalding's catchfly, implementation of Alternative 4 results in a "*May Affect, Likely to Adversely Affect"* determination and for whitebark pine, a "*no effect"* determination.

Hexazinone and triclopyr may be used in proximity to sensitive plants which occur in forested areas. The CFO has only utilized hexazinone in one project for reforestation in the past ten years. A significant increase is not expected in the use of either product in the future. Sensitive plant clearances would occur prior to implementing any tree planting project, so risk to sensitive species in forested environments would be minimal as SOP and mitigation measures would be implemented to avoid unacceptable impacts. As for the Proposed Action alternative, sensitive plants located within a project would be impacted by herbicides if the plant were sensitive to the particular active ingredient. In relation to BLM sensitive plant species, Alternative 4 *"may impact individuals but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species"*.

Cumulative Effects

This alternative closely mimics the Proposed Action in relation to cumulative effects since control tools and herbicide application methods are the same. The threat of shrub or tree like weeds is not high so the fact that this alternative better treats those species is not expected to contribute to cumulative effects either positively or negatively.

4.3 Water Quality

4.3.1 Proposed Action

Direct and Indirect effects

The proposed action has the potential to affect surface water quality through introduction of active ingredients into water during application or by herbicide treatments altering vegetation cover and resulting in changes to water quality parameters such as temperature or sediment.

Herbicide could be introduced into water through overspray while treating vegetation on the edge of a waterbody. Off-site movement of herbicides from the application area to water could occur through air movement as drift during application or high wind events moving soil along with herbicide that may have adsorbed to the soil particles to a waterbody. Herbicide could also reach water after application if a high precipitation event occurred after treatment and moved either herbicide or soil particles to which herbicide has adsorbed into a waterbody. Herbicides could also leach through soil in water and enter either groundwater or surface water. There is also the potential for introduction of herbicides into water through an accidental spill.

Design features in the proposed action and adherence to SOPs and mitigation measures made a part of the proposed action decrease the potential for water quality impacts of any concern. The concern for introduction of herbicides as a contaminant into water center primarily on health and human safety from consumption of contaminated drinking water or fish from contaminated water and the impact of herbicides on survival of plants and animals potentially living in the habitat contaminated. Numerous scenarios were modeled in the PEIS in an attempt to quantify the risks associated with contamination of water by herbicides in the proposed action. Water quality concerns in relation to human health and safety will be discussed in further detail in the human health section and impacts related to fish and aquatic species will be further developed in that section.

The proposed action does not include direct treatment of aquatic vegetation. Therefore, there is no concern in relation to purposeful introduction of herbicides into water as part of a vegetation treatment. The proposed action also implements buffers of various kinds to protect water resources. Berg's (2004) compilation of monitoring studies on herbicide treatments with various buffer widths showed that any buffer helps lower the concentration of herbicide in streams adjacent to treatment areas. In California, buffers between 25 and 200 feet generally had no detectable concentration of herbicide in monitored streams with detection limits of 1-3 mg/m3 (ibid). In South Carolina, ground applications of the herbicides imazapyr, picloram and triclopyr had no detectable concentrations of herbicide in monitored streams with buffers of 30 meters (comparable to 100 feet) (USDA Forest Service 2003). Picloram, which is considered a higher risk for water contamination due to its persistence and solubility in water, may not be applied within 100 feet of live water. Within fifteen feet of water, only formulations approved for aquatic use such as glyphosate, which is practically non-toxic to aquatic organisms and imazapyr, which rapidly degrades in aquatic solutions may be applied. In addition, the proposed action includes changes in application technique to decrease the potential for unintended drift of herbicide from the target area. Aerial application would not occur adjacent to water bodies as various buffer widths next to streams have been implemented. The proposed action also includes design measures to decrease the amount of herbicide active ingredient applied near live waters. Within 100 feet of water, only spot application of target plants may occur. Spot application to individual plants dramatically reduces the amount of herbicide active ingredient that would be applied per acre near live waters when compared to a broadcast treatment.

Control of noxious weeds by whatever method is not expected to result in any measurable effects to peak/base flow, water yield, temperature or sediment yield. No large scale changes in land cover conversions or stand structure (e.g., timber to grass, shrubs to grass) would result from the proposed action weed control. No large areas of bare ground would occur with the implementation of the proposed action as larger areas of treatment would utilize selective herbicides. An example of this is the typical treatment of yellow starthistle in an upland area by aerial application of picloram. Picloram at prescribed rates for the control of yellow starthistle does not impact grass species. Therefore, the treatment area often will experience an increase in cover of grass species once the weed is removed. There is little opportunity for increase of bare ground that could result in sediment delivery to water courses. Long term beneficial effects from reduction of noxious weeds and increase or maintenance of desirable vegetation would result in improved watershed conditions.

Herbicide treatment of weeds would occur in riparian conservation areas through targeted application of herbicides with low to moderate aquatic risk within 100 feet of water. There again, only aquatically approved herbicides (low toxicity to aquatic organisms) would be applied within fifteen feet of the water. A typical example of this type of treatment would be removal of Canada thistle or purple loosestrife in a riparian area. Herbicides that would be used in close proximity to water do not cause immediate burn down of vegetation therefore they would not immediately decrease the vegetation shading of water. There may be some short-term decrease of water shading, but that would be quickly remediated by the resiliency of native riparian plants and them moving to make use of the resources available as a result of the removal of the target plant.

It is not expected that biological controls would have potential to negatively impact water quality parameters. Currently weeds targeted for biological control occur in upland areas, so their removal would not impact direct shading of water. Any resources made available through control of a target weed would quickly be utilized by other plants and the nitch would be occupied before bare ground cover would significantly increase.

The limited manual control that is expected to take place is not expected to have any impact on water quality parameters.

The long-term effects of weed treatments, particularly in 303(d) listed watersheds, would be beneficial to water quality. Reducing the number of acres degraded by weed infestations provides long-term benefits to water quality with the return of more stable soils, attenuated nutrient cycling, and return to normal fire cycles (BLM 2007a). The proposed action alternative would increase the range of herbicides available to BLM managers and would allow for the use of additional active ingredients if approved by BLM. The ability to use additional herbicides as they become registered with the EPA would allow more options in choosing herbicides to match treatment goals and application conditions. The proposed action would also permit the use of new approved herbicides that may pose less risk to riparian areas than currently used herbicides, which would increase the effectiveness of treatments in maintaining healthy riparian and upland vegetation communities while minimizing potential negative impacts.

Conducting a herbicide treatment to control vegetation involves a potential risk of an accident or spill. Should that event occur in proximity to water, there could be the direct introduction of a herbicide active ingredient into the water. The direct introduction of the pollutant into the water at a level elevated enough to impair water quality or the beneficial use of that water is highly dependent upon the amount of active ingredient introduced, the specific toxicity of the active ingredient, and the volume of water into which the herbicide was introduced. The highest risk for water quality impacts as the result of an accident would be the deposition of a fully loaded helicopter (including herbicide and fuel) into a small tributary. A more plausible spill scenario would be a vehicle accident on the highway along a main stem river that causes the loss of a volume of fully mixed product from a 200 gallon slip tank. Should that product be mixed for broadcast spraying, herbicide destined for 6.6 acres could be deposited into the river. Given typical flows of main-stem rivers, the herbicide would be diluted to levels below concern in a matter of minutes.

Manual and biological treatments are highly unlikely to impact ground water quality. However, studies have shown that ground water supplies may become contaminated with herbicides and other contaminants (total dissolved solids, metals, etc). Generally, shallow ground water aquifers are at greater risk for contamination than deeper sources (BLM 2007a). Precipitation levels also influence the likelihood of contamination; areas with higher precipitation levels are at greater risk (BLM 2007a). Adopted SOPs and mitigation measures would minimize the potential for ground water contamination. However, dicamba and picloram (currently approved herbicides) are known groundwater contaminants (BLM 2007a).

Groundwater monitoring by the Idaho State Department of Water Resources (IDWR) and Idaho State Department of Agriculture (ISDA) have found pesticides in some groundwater. Fortunately, the concentrations of the detected pesticides have been well below any MCLs (maximum contaminant levels) or Health Advisories (IDWR 2011). Monitoring in the FO area by the Idaho Department of Agriculture shows the presence of picloram in two sampled wells. These wells are located in agricultural areas where herbicides are utilized over larger areas and more commonly than what is proposed by BLM (ISDA 2010).

The proposed action alternative would enable BLM managers to use imazapic (not known to contaminate ground water) in place of these known ground water contaminants, potentially increasing protection for ground water sources. Additionally, this alternative permits the use of new herbicides as they become registered with the EPA, and would allow more options in choosing herbicides to match application conditions and minimize risks to ground water.

Cumulative Effects

For all alternatives, the geographic scope for the analysis of cumulative effects is the FO area, and the timeframes for the analysis set at twenty years in the past and ten years in the future. In relation to water quality however, the Snake and Salmon Rivers carry water from outside the FO area. Past activities in relation to water quality and weed control center around the change in watershed condition resulting from weed invasion and the weed control activities that have been employed to control those weeds. Some increase in sediment load to water courses may have occurred through the establishment of large infestations of yellow starthistle in upland areas. In addition, spotted knapweed has been shown to increase sedimentation in areas where it is the primary cover. A majority of weed control through herbicide application occurs on private lands in the large agriculture areas of the Palouse and Camas prairies. Numerous herbicides are used to assure quality and high yielding crops of hay, small grains, oilseed, and other agricultural products. Other entities conducting weed control (Federal, State and Tribal) would not have contributed significantly to past herbicide loads in watersheds or are not the likely source of contamination of groundwater found in wells located in the agricultural areas.

In relation to present and future cumulative effects, up to 800 acres of herbicide application in the FO area (0.01% of the total FO area) would not increase the risk or potential for cumulative effects when added to the herbicide use that would be expected to continue on the agricultural lands. In relation to cumulative effects, due to the significant oversight, design measures, SOPs and mitigation measures employed with the implementation of the Proposed Action, weed control in the CFO has minimal potential to negatively impact water quality or riparian habitats in the analysis area in the future.

4.3.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect effects

This alternative provides eight additional AIs for use in the CFO. Two of the AIs are for aquatic weed control, two are used mostly in forestry applications, two are for bare ground type treatments and the other two are not herbicides that would be used for weed species currently occurring in the CFO. All other elements are the same as in the Proposed Action including application methods, biological and manual tools.

Diquat and fluridone are AIs that would be employed directly in water as aquatic weed control herbicides. Should aquatic weed control projects become necessary, this alternative would allow tools for the project potentially resulting in short-term negative effects to water quality and non-target aquatic plants. In relation to non-target aquatic habitat impacts, these AIs would impact desirable aquatic plants and would be directly added to the water, potentially impacting surface water quality. The long-term benefits of a properly executed project to aquatic habitats would be positive.

Hexazinone and triclopyr are herbicides mainly used in forestry applications. Triclopyr may be helpful in the control of Japanese knotweed, which is a common riparian weed. This fact may increase slightly the effectiveness of this alternative over the proposed action in the control of riparian weeds that decrease the quality of riparian habitats. Use of these products in forestry applications would not be likely to have any impact to water quality as their use would occur outside RCAs and they pose little additional risk to water quality as modeled in the PEIS.

It is not expected that many acres of bromacil, diflufenzopyr, diuron or tebuthiuron use would occur in this alternative. Therefore, it is not expected that there would be much risk to water quality over what was described in the proposed action. Bromacil and diuron have higher risks to aquatic systems than other available AIs so their use would be limited to upland areas far away from sensitive water resources.

Cumulative Effects

The cumulative effects of Alternative 1 would be essentially the same as the Proposed Action, as the only difference is in herbicide AIs. In looking at past records, limited use of hexazinone occurred in the FO. Therefore, it is not expected that significant use of the additional eight active ingredients would occur. Inclusion of these eight ingredients would not be expected to change future cumulative effects in relation to water quality.

4.3.3 Alternative 2 – No Aerial Application

Direct and Indirect Effects

It is expected that weed control would be reduced by one-half in comparison to the proposed action, alternative 1 or alternative 4. As a result there would be a correlating reduction of potential risk to water quality from contamination with herbicide, although a reduction of levels already below levels of concern is not dramatic.

In general there is slightly less risk of off-site herbicide movement to water bodies as a result of drift from aerial application. Because less acreage would be accomplished, there is also less chance that herbicide would be delivered to water courses through overland flow caused by high precipitation events that occur shortly after application. Weed control would take place in RCAs by ground based methods at the same levels and in the same general way as in the proposed action, alternative 1 and alternative 4 so the risks from ground based herbicide application would be the same as described in the proposed action. Benefits to watersheds from large-scale herbicide treatments to control weeds would not occur if aerial application was the only feasible method of treatment because these areas would not be as effectively treated under this alternative. This alternative would have increased risk of impact to water quality parameters, such as sediment loads, as extensive weed infestations have shown to increase the potential for unstable soils and resultant sedimentation to water courses.

Cumulative Effects

Cumulative effects of other past, present and reasonable foreseeable actions on water quality would be essentially the same as described for the Proposed Action alternative. It is not expected that reduction of weed control by one-half would have any appreciable change to effects in relation to contamination of water by herbicide. There may be a very slight increase in the potential for sediment delivery to water as a result of uplands remaining infested with weeds as aerial application is primarily used in concert with other landowners to implement effective strategies to reduce weed spread.

4.3.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

This alternative would have no direct or indirect effects to water quality due to introduction of herbicides directly into water.

This alternative would be the least effective in preventing spread of weeds currently located within the FO and would be unlikely to provide the tools necessary to effectively treat newly invading weeds if the population size is over a couple of acres. Therefore, this alternative would have the highest risk to water quality parameters of sediment and temperature. Weeds such as yellow starthistle and spotted knapweed can decrease watershed stability and large populations of these plants in the watershed could increase the potential for soil movement and delivery of sediment to waterbodies. Saltcedar, Japanese knotweed and Russian olive have the potential to replace native vegetation in riparian habitats and could impact bank stability as well as shading of water.

Cumulative Effects

Cumulative effects of other past, present and reasonable foreseeable actions on water quality would be essentially the same as described for the Proposed Action alternative. Lack of herbicide use by BLM is not expected to appreciably change water quality when paired with the effects of other activities in the watershed. There may be a slight increase in sediment loading to watersheds because BLM lands could not be treated along with cooperators to form effective weed control. Weeds such as spotted knapweed have been shown to increase erosion potential. Therefore, increased weed populations on BLM lands may lead to a slight potential for increase in sediment delivery to waterbodies.

4.3.5 Alternative 4 – No Action

Direct and Indirect Effects

Impacts to surface water quality as a result of weed management methods utilized under the no action alternative would be similar to those described for the proposed action alternative. Imazapic would not be available for use under this alternative. This herbicide is less toxic than picloram and can be used to treat leafy spurge. It is also utilized for control of annual grasses. Not having the use of this herbicide would decrease options for assuring healthy upland communities and reduction of annual grasses. This could potentially contribute to watershed degradation due to increased soil erosion and altered fire regimes. In addition, new herbicides approved for use by BLM could not be utilized in the FO. This alternative somewhat reduces BLMs ability to utilize the best herbicide tool for the job at hand. However, the potential for contamination of groundwater as a result of weed management methods utilized under the No Action alternative would be similar to those described for the Proposed Action alternative.

Cumulative Effects

It is expected that cumulative effects on water quality of the No Action alternative are essentially the same as the Proposed Action.

4.4 Fisheries and Special Status Fish

4.4.1 Proposed Action

Riparian systems may be invaded by non-native species, which can be detrimental to native aquatic species. In riparian areas, non-native plants often support fewer native insects than native plant species, which could affect food availability for insectivorous fish species such as salmonids. The replacement of native riparian plant species with some invasive species may adversely affect stream morphology (including shading and instream habitat characteristics), bank erosion, and flow levels. Removal of invasive species through herbicide use, when physical and climatic conditions, and application methods and herbicide formulations allow treatments to be safe for native species and water quality, can help to restore a more complex vegetative and physical structure and natural levels of process such as sedimentation and erosion. In addition to the use of herbicides, other control methods used to remove invasive species include: manual control, mechanical control, and biological control releases. The proposed action includes aerial herbicide application of up to 400 acres and ground herbicide application of up to 400 acres. Analysis presented in the water quality section on how herbicides can enter waterbodies and how the proposed action reduces that risk is relevant to potential impacts to fisheries resources. This assessment of impacts assumes that that design measures, best management practices, and specific standards and project criteria would be used to reduce potential unintended impacts to fish and other aquatic organisms, water quality, aquatic habitats, and riparian habitats.

Direct and Indirect Effects

The proposed action implements numerous design features, mitigation measures, and SOPs in order to reduce the potential for impacts to aquatic species from herbicide use. Examples of these include buffers for aerial application to protect waterbodies from drift and only the use of spot treatments within one-hundred feet of live water to reduce the potential for drift and reduce the amount of active ingredient applied near streams. In addition, there are buffers that employ use of aquatically approved herbicides near streams. Caution is also implemented in the choice of aquatically approved surfactants for use in all herbicide applications regardless of distance from waterbodies.

Fish and other aquatic animals are exposed to herbicides in three primary ways: 1) dermally, by direct adsorption through the skin from swimming in herbicide contaminated waters; 2) breathing, by direct uptake of herbicides through the gills or mouth during respiration; and 3) orally, by drinking herbicide contaminated water or feeding on herbicide contaminated prey (BLM 2007a).

Of concern for impacts to fish and aquatic species in relation to herbicides are effects to the essential biological requirements of survival, growth and reproduction. The potential for impact is directly related to the amount of herbicide concentration in the water (dose), the length of exposure to the contaminant, the sensitivity of the species, and the toxicity of the compound. Fish and other aquatic organisms have the potential to be adversely affected by contact with a concentration of herbicide that exceeds levels of concern in water. This can be direct impact to the fish itself or indirect, such as herbicides impacting aquatic invertebrates that rely on terrestrial plants to fulfill their life cycle and thus reduce the availability of food for fish. Application rate is a major factor in determining risk, with higher application rates more likely to result in risk in various exposure scenarios.

Risk assessments were developed for each AI to quantify the risk to fish and other aquatic species from application of herbicides under a variety of exposure scenarios. These include impacts to fish resulting from direct spraying of herbicides into the water, drift of spray into water, surface runoff, wind erosion and accidental spills. Information contained in these documents includes specific toxicological data on each herbicide proposed for use and the risks to various components of the environment. Specific details on each active ingredient can found on pages 4-82 thru 4-87 of the PEIS. The following information is summarized from the document in relation to herbicides in the proposed action.

- As would be expected, there is some risk to aquatic invertebrates and fish from most accidental exposure scenarios involving herbicides (spills).

– There was no risk to fish as a result of wind transport of herbicide particles under all evaluated scenarios.
– Chlorsulfuron, dicamba, imazapic and sulfometuron methyl are relatively safe to fish and aquatic invertebrates and there is no risk associated with the use of these herbicides under any evaluated scenarios, including accidental direct spray or spill.
– Metsulfuron methyl has no risk to fish or aquatic species for all evaluated scenarios except a low risk in the case of an accidental spill at the maximum rate.

Herbicides can alter the structure and biological process of both terrestrial and aquatic ecosystems; these effects of herbicides may have more profound influences on communities of fish and other aquatic organisms than direct lethal or sublethal toxic effects (Norris et al. 1991). Herbicides used for aquatic invasive plant control have been shown to affect aquatic ecosystem components; however, concentrations of herbicides coming in contact with water following land-based treatments are unlikely to be great enough to cause such changes (Norris et al. 1991).

Sublethal effects can include changes in behaviors or body function that are not directly lethal to the aquatic species, but could have consequences to reproduction, juvenile to adult survival, or other important components to health and fitness of the species.

Refer to Table 4-2 below for a summary of potential subbasin herbicide applications. Annually, only 800 acres of herbicide treatments are proposed. Acreage depicted in the table was computed from the maximum annual amount of herbicide application which could potentially occur in any watershed in any one year. A larger treatment may occur in a watershed one year, but no treatment may occur there the next two years.

Table 4-2. Subbasin Summary of Proposed Herbicide Applications

Subbasin	Mainstem River Face Drainages	Fish Bearing Tributaries	Within RCAs	Within 100 ft. of Stream	Within Riparian Areas
Lower Snake River	310 acs – 68.7%	135 acs.-30.3%	49.4 acs.-11.1%	20.7 acs.-4.6%	5.2 acs.-1.2%
Snake River	25.5 acs – 23.9%	81 acs.-76.06%	5.1 acs.-4.79%	2.1 acs.-1.96%	1.05 acs.-0.98%
Lower Salmon River	515 acs.-54.4%	431.5 acs.-45.59%	72.9 acs.-7.70%	20.04 acs.-2.12%	10.02 acs.-1.06%
Little Salmon River	117 acs.-44.7%	145 acs.-55.34%	29.2 acs.-11.15%	8 acs.-3.06%	4 acs.-1.53%
Middle Salmon River	10 acs.-31.3%	22 acs.-68.75%	9.2 acs.-28.75%	3.30 acs.-10.32%	1.65 acs.-5.16%
South Fork Salmon River	0 acs.-0%	10 acs.-100%	2 acs.-20%	0.10 acs.-1.0%	0.05 acs.-0.50%
Clearwater River	25 acs.-33.8%	49 acs.-66.22%	13.3 acs.-17.97%	4.4 acs.-5.94%	2.2 acs.-2.97%
South Fork Clearwater River	6 acs.-8.4%	65.8 acs.-91.64%	28.7 acs.-39.97%	21.1 acs.-29.39%	10.55 acs.-14.69%
Middle Fork Clearwater River	0 acs.-0%	0 acs.-0%	0 acs.-0%	0 acs.-0%	0 acs.-0%
TOTAL	1,123 acs.-54.2%	950 acs.-45.82%	210 acs.-10.12%	81 acs.-3.89%	40 acs.-1.94%

The total acreage in Table 4-2 does not relate to the total annual treatment rather it depicts a worst case scenario for any subbasin in any one year, and presents relative percentages of annual herbicide treatments that would occur in any subbasin, percentage occurring in mainstem face drainages and fish bearing tributaries, and within RCAs, 100 feet of a stream, and riparian areas. Approximately 82 percent (1,578 acres) of the total area proposed for herbicide treatments occur in mainstem river face drainages, while 18 percent (352 acres) occurs in fish bearing tributary watersheds. It is estimated that 6 percent (117 acres) of the areas proposed for herbicide application occur in RCAs; however, only 30 acres of riparian habitat would have selective spot spraying of weeds.

Federally Listed and BLM Sensitive Fish

Because the CFO provides habitat for ESA listed fish species, a Biological Assessment (BA) was developed to further quantify the risk of the IWM program planned for implementation in the FO under the Proposed Action to those listed species and critical habitats (BLM 2011). This programmatic assessment for ESA listed fish species covers any relevant concerns for BLM sensitive species and non-listed species. Information reviewed included the amount of treatment acres that would occur within RCAs and the amount of herbicides that may be used within each watershed. Additional modeling was done to assess risk from aerial application, accidental spills and other exposure scenarios specific to the proposed action. Numerous parameters are utilized to determine risk of herbicide drift reaching waterbodies including size of spray droplets, height of the application, spray pressure, wind speed, speed of application equipment, tendency of the herbicide to volatize, etc. Various risk scenarios involving movement of herbicides to waterbodies from overland flow or leaching included looking at the specific properties of the herbicides such as half-life, water solubility and the affinity of the herbicide to adsorb to soil. Once the risk of herbicides reaching waterbodies is determined for various scenarios, it must be determined if the herbicide is present in sufficient strength to impact the fish. In order to assess this risk, toxicology data for each herbicide is reviewed. The most sensitive effect from the most sensitive species tested is used to determine the toxicity indices for each herbicide. Information summarized from the BA is included below.

In relation to the AIs in the proposed action, at typical use rates, analysis indicates eight of the ten herbicides have a low level of aquatic concern. Picloram and sulfometuron methyl have a moderate level of concern mainly due to their persistence. Picloram has specific buffers applied to avoid application near water and reduce the potential risk for accidental movement of the AI into water. The potential effects from the proposed action in relation to fish and aquatic species vary because of topography, soils, vegetation characteristics, proximity to water, species occurrence, life stage present, and herbicide properties. Treatments completely outside of the aquatic influence zone with no mechanism for herbicide delivery warrant a “no effect” determination. However, spot treatments up to the water’s edge and along streams have the potential to deliver aquatic use herbicides to water. These treatments are not likely to adversely affect fish and their habitat because treatments have been designed to minimize introduction of herbicide into aquatic habitats as well as avoid substantial amounts of sedimentation. Toxic levels of herbicides are unlikely to enter streams or lakes due to the ability to alter application methods and distance from water, timing, active ingredients and formulations, and other project design features. Effects to immediate streamside cover cannot be avoided and there may be small droplets of aquatic herbicides coming in contact with water. For example, treatment of riparian species growing along the streambank (above ordinary high water) may result in insignificant amounts of aquatic glyphosate in water 24 hours after treatment. In regard to habitat, weed control that takes place in riparian areas would potentially lead to maintenance or improvement of riparian habitat. It would provide long-term desirable riparian conditions, improved bank cover and shading, improved large woody debris recruitment potential, and improved instream fish habitat over time.

Impact from manual and biological control to aquatic species is expected to be discountable. Most impacts of these methods would be to habitat such as short-term increase in small areas of bare ground as described in the water quality section. Table 4-3 displays the ESA listed fish and BLM sensitive species effects determination for the Proposed Action alternative.

Table 4-3. ESA-Listed and BLM Sensitive Fish Determinations for the Proposed Action

Species and Status	Effects Determination
Sockeye Salmon *ESA – Listed Endangered*	Species : May Affect, Not Likely to Adversely Affect Critical Habitat: May Affect, Not Likely to Adversely Affect
Spring/Summer Chinook Salmon *ESA – Listed Threatened*	Species: May Affect, Likely to Adversely Affect Critical Habitat: May Affect, Likely to Adversely Affect
Fall Chinook Salmon *ESA – Listed Threatened*	Species: May Affect, Likely to Adversely Affect Critical Habitat: May Affect, Likely to Adversely Affect
Steelhead Trout *ESA – Listed Threatened*	Species: May Affect, Likely to Adversely Affect Critical Habitat: May Affect, Likely to Adversely Affect
Bull Trout *ESA – Listed Threatened*	Species: May Affect, Likely to Adversely Affect Critical Habitat: May Affect, Likely to Adversely Affect
Westslope Cutthroat Trout *BLM Sensitive*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.
Redband Trout *BLM Sensitive*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.
Spring/summer Chinook Salmon *BLM Sensitive – (Clearwater River)*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.
Pacific Lamprey *BLM Sensitive*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.

Determination Rationale

The main factor influencing determinations is herbicide use. The CFO is proposing herbicide treatments in watersheds containing habitat for various live stages of special status fish via aerial application. Due to the height above the ground that aerial application takes place, BLM cannot guarantee that a negligible amount of herbicide AI would not reach live water in the case of a wind gust. In addition, application would occur along roadsides with ditches that could concentrate water and ephemeral channels. Overall, the BLM spraying of road shoulder areas would comprise a very small amount of the total acreage and would primarily be spot spraying of target plants. Even so, should a high intensity thunderstorm occur directly after application, herbicide could be transported directly to fish bearing water. Even with implementation of buffers and protocols designed to reduce the potential for delivery of herbicides to water, it cannot be guaranteed that discountable levels of herbicide AIs would not reach critical habitat in these unusual circumstances. As supported by modeling done for the BA, it is expected that any herbicide reaching live waters as a result of application would be at concentrations well below levels of concern, particularly applications outside of RCAs. Of course, the highest risk to listed species would be the result of an accidental spill. This is unlikely to occur and not an action proposed by BLM, but is still a potential result of implementing the proposed action.

Application of herbicides in the proposed action is not expected to result in mortality to listed fish. However, there is some uncertainty about potential sub-lethal effects such as changes in reproductive behavior, developmental abnormalities, reduced ability to adapt to salinity gradients, reduced ability to tolerate shift in environmental variables, changes in migratory behavior, etc. The potential for adverse sub-lethal effects occurring in mainstem rivers (e.g., Snake, Salmon, and Clearwater Rivers) is reduced significantly because of the large volumes of water and the dilution factor. Risks may be assumed to be greater in tributary watersheds providing habitat for listed fish that would have herbicide treatments within RCAs and riparian areas due to lower water volumes. Overall, a small percentage of herbicide application would be conducted in these areas. It may be assumed that risks to listed fish are correlated with acreages treated within RCAs and riparian areas. All treatments within riparian areas would be ground based and consist of spot treatments of target species. Tributary drainages where herbicide treatment would be less than five acres within the RCA or less than one acre within the riparian area were considered to have negligible risks for adverse effects to listed species or aquatic/riparian habitats. Of 115 tributary stream segments in the CFO providing habitat for ESA listed fish where herbicide treatments may occur, three fish bearing tributaries have proposed chemical treatments that would exceed five acres in the RCA or exceed more than one acre of spot spraying in the riparian area (Corral Creek, Eagle Creek, and American River). Adherence to specific noxious weed control standards and criteria is expected to minimize risks for adverse effects to listed species. However, because of previously identified concerns with sub-lethal effects and lack of site specific fate and transport modeling for herbicides, these projects were considered to be relatively more sensitive for potential risks.

Chemical control is expected to have a low risk for water contamination because of the buffers which would be used along riparian areas for helicopter spraying and due to the use of special guidelines for ground based herbicide application within riparian areas and along live waters. Implementation of hazardous materials (fuel and herbicide) transportation, storage, and emergency spill plans would result in a low risk for hazardous material contamination (fuels and herbicides) of ground water and surface water.

No effects from harassment are expected to occur to federally listed or BLM sensitive fish from chemical noxious weed control activities.

Critical habitat determinations are based on potential effect to the primary constituent elements (PCE) (BLM 2011). PCEs include such things as water quality, water temperature, cover, channel form and stability, spawning and rearing substrate, and availability of migratory corridors. Although, invasive plant treatment projects may be conducted in close proximity to designated critical habitat, the potential to impact most of the PCEs at high levels is very low. However, the use of picloram in aerial treatments and ground treatments within RCAs (not authorized within 100 feet of streams) may increase the levels of risk to water quality and non-target riparian habitats. Invasive plant treatment projects are not expected to create significant amounts of sediment leading to direct or indirect adverse effects to habitat.

Any increase in sediment would be localized because herbicides would be used as opposed to heavy equipment. Manual and mechanical invasive plant control measures involve very small acreage and are not expected to create measurable amounts of sediment. Invasive plant treatments conducted in critical habitat would help to restore or maintain the native riparian vegetation that is essential to maintaining the primary constituent elements of critical habitat in the long term.

Magnuson Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan.

EFH is defined in the Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH includes all freshwater streams accessible to anadromous fish (Chinook, Coho, and pink salmon), marine waters, and inter-tidal habitats. The objective of this EFH assessment is to determine whether or not the proposed action "may adversely affect" designated EFH for relevant commercially, federally-managed fisheries species within the proposed action area.

As described in the effects analysis section of the BA (BLM 2011) and summarized in this EA, the proposed actions are not expected to reduce the quality of EFH from the use of nonherbicide methods, or result in impact to sediment and cover. Chinook salmon may be adversely affected because the quality of EFH may be degraded from herbicide applications of picloram in the Proposed Action alternative (or in Alternative 1, Alternative 2 and Alternative 4). As discussed for the ESA listed fish analysis above, under certain scenarios a discountable level of the herbicide may reach waters that provide EFH. Since this potential effect could occur, an "Adverse Effect" determination is concluded for Chinook salmon EFH, from implementation of each of the alternatives utilizing herbicide treatments.

Cumulative Effects

In relation to fisheries and special status fish the general geographic scope for cumulative effects discussion is the CFO area. The timeframe for analysis is twenty years in the past and ten years in the future.

Past and present actions that have contributed to impacts to fisheries resources center around habitat changes including dam building, habitat alteration from management actions and water quality degradation. Upland and riparian habitat modification from invasive species impacts could have included an increase in sediment and changes to riparian habitat structure including woody debris. Past actions that could have negatively contributed to fisheries resources are the use of herbicides to control those weeds by landowners and resultant contamination of waterbodies.

As pointed out in the water quality section, the future implementation of up to 800 acres per year of herbicide application (0.01% of the total FO area) is not expected to contribute significantly to cumulative effects in regard to fish habitat parameters or impact the fish themselves. Most of the 10 herbicides proposed for use under this alternative would have short term transient effects on fisheries, aquatic habitats, riparian habitats, and special status species. Picloram is considered to have a moderate risk due to its persistence; however, project design measures have been identified to minimize potential adverse effects.

All treatment methods could result in minimal sediment from loss of target or associated vegetation; however the negative effects of herbicide treatments would be transient and short term. Long term benefits would occur with reduction of invasive species and establishment of desirable vegetation.

Foreseeable future actions that may affect aquatic resources include herbicide applications on other land ownerships. Other actions include a variety of ongoing land uses which have the potential to impact aquatic and riparian habitats, which include livestock grazing, timber harvest, road use and maintenance, road construction, restoration actions, prescribed burning, and urban and rural development.

Given the way animals, including fish, metabolize the herbicides proposed under this project, chronic, lingering impacts are unlikely (BLM 2011). This alternative is unlikely to contribute to cumulative adverse effects to aquatic resources given the SOPs, mitigation measures, and design features of the proposed action that minimize the potential for direct and indirect, and thus cumulative effects.

Because of project design measures, SOPs, mitigation measures, and small amounts of acreage of treatment that would occur annually in any watershed, there would not likely be a contribution to cumulative fisheries, aquatic habitats, and special status fish species impacts under the proposed action. Changes to fish habitat from loss of target or nontarget vegetation, erosion and sediment, and loss of shade are predicted to be so minor that no cumulative effects are possible.

4.4.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect effects

With the exception of eight more herbicides that may be used compared to the Proposed Action alternative, the direct and indirect effects to fishery resources are the same as described for the Proposed Action alternative. Herbicide applications within sensitive areas (i.e., RCAs, within 100 feet of stream, and riparian areas) would be similar and herbicide application acres (800 acres) would be the same.

<u>Federally Listed and BLM Sensitive Fish</u>

Impacts to ESA-listed fish, Idaho BLM sensitive fish, critical habitats, and EFH would be the same as identified for the Proposed Action alternative. See Table 4-3 and BLM's rationale for BLM's effects determinations on pages 79-84 of this EA.

Cumulative Effects

Invasive plant control measures utilized under this alternative would result in similar cumulative impacts as those described for the Proposed Action alternative. The use of eight additional herbicides would not change the cumulative effects analysis.

4.4.3 Alternative 2 – No Aerial Application

Direct and Indirect effects

Less acres (400 acres) would be treated without use of aerial herbicide applications, but the direct and indirect effects are similar to the Proposed Action, as discussed below.

Alternative 2 would allow use of the same herbicides in the same areas as defined for the Proposed Action and would have the similar benefits for control of undesirable invasive plant species and potential effects to fish and riparian/aquatic habitats. Although this alternative would not allow the use of aerial application methods, thereby reducing the total potential treatment acreage with herbicides to 400 acres, there would be no difference between Alternative 2 and the Proposed Action as far as acreage treated in riparian/aquatic habitats and RCAs. All (100%) of the acres proposed for treatment in riparian/aquatic habitats and within RCAs under the Proposed Action could be treated using ground-based methods, and therefore could also be treated under Alternative 2.

This alternative would substantially reduce the potential for impacts to water bodies as a result of off-site drift from aerial applications on upland habitats. Drift is a primary route for potential adverse impacts to non-target riparian vegetation, water bodies, fish, and aquatic/riparian invertebrates; with aerial application the primary cause of off-site drift. Therefore, per area impacts to aquatic/riparian species and habitats would be much lower under this alternative than under the Proposed Action, Alternative 1 (18-Active Ingredients) and Alternative 4 (No Action), and more than under Alternative 3 (No Herbicide). However, without the use of aerial spraying, large areas of vegetation would remain untreated under this alternative, which could lead to continued or future infestation of invasive plants occurring in upland habitats to the detriment of nearby streams and other riparian/aquatic habitats.

Federally Listed and BLM Sensitive Fish

For the 400 acres that would be treated with herbicides under Alternative 2, BLM's effects determinations for ESA-listed fish, Idaho BLM sensitive fish, critical habitats, and EFH would be the same as identified for the Proposed Action alternative. See Table 4-3 and BLM's rationale on pages 79-84 of this EA.

Cumulative Effects

Invasive plant control measures utilized under this alternative would result in similar cumulative impacts as those described for the Proposed Action alternative. Non-aerial application on half the herbicide treatment acreage would not have any appreciable change to cumulative effects analysis at a landscape and watershed level.

4.4.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect effects

A total of 60 acres of manual and mechanical invasive plant control measures would be implemented under this alternative, along with the same number of biological control releases identified under proposed action. Under this alternative, no BLM lands would be treated with herbicides. Therefore, there would be no herbicide impacts to aquatic species and special status fish species or aquatic habitats as a result of herbicide exposure during vegetation treatments. The BLM would likely be less effective at controlling weed infestation than under the other alternatives. Consequently, there would be fewer benefits to special status fish, other aquatic species, and aquatic/riparian habitats that are degraded by non-native plant species. If other treatment methods such as mechanical treatments were used to control weeds in riparian areas instead of herbicides, the disturbance to habitat could be greater. Mechanical methods can result in greater sedimentation into aquatic habitats and more extensive removal of riparian vegetation, as compared to herbicide treatments, which would affect water quality. Negligible effects to riparian habitats would be expected to occur from manual control methods, and these methods would minimize adverse effects to non-target riparian vegetation and aquatic habitats.

Federally Listed and BLM Sensitive Fish

As summarized in Table 4-4 below, Alternative 3 would have no effect, or is less likely to adversely affect, special status fish species or their critical or essential fish habitat. There would be no exposure to herbicides during vegetation treatments. The small amount of acres of manual and mechanical treatments that would occur annually in any watershed would result in minor changes to aquatic habitat from loss of target and/or nontarget vegetation, erosion and sediment, and loss of shade.

Table 4-4. ESA-Listed and BLM Sensitive Fish Species Determination for Alternative 3 – No Herbicide or Exotic Biological Control

Species and Status	Effects Determination
Sockeye Salmon *ESA – Listed Endangered*	Species : No Effect Critical Habitat: No Effect
Spring/Summer Chinook Salmon *ESA – Listed Threatened*	Species: May Affect, Not Likely to Adversely Affect Critical Habitat: May Affect, Not Likely to Adversely Affect
Fall Chinook Salmon *ESA – Listed Threatened*	Species: No Effect Critical Habitat: No Effect
Steelhead Trout *ESA – Listed Threatened*	Species: May Affect, Not Likely to Adversely Affect Critical Habitat: May Affect, Not Likely to Adversely Affect
Bull Trout *ESA – Listed Threatened*	Species: May Affect, Not Likely to Adversely Affect Critical Habitat: May Affect, Likely to Adversely Affect
Westslope Cutthroat Trout *BLM Sensitive*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.
Redband Trout *BLM Sensitive*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.
Spring/summer Chinook Salmon *BLM Sensitive – (Clearwater River)*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.
Pacific Lamprey *BLM Sensitive*	May impact individuals but not likely to contribute to a trend toward Federal listing or cause a loss of viability to populations.

Cumulative Effects

Herbicide applications would not occur under this alternative, which would avoid adverse impacts to aquatic species compared to the acres that would be treated under the other alternatives (800 acres for the-Proposed Action; 400 acres for Alternative 2 and Alternative 4) Less risk for effects to non-target vegetation, water quality, riparian/aquatic habitats, and special status fish would occur. Private and non-BLM land effects to aquatic/riparian habitats would be similar as described for the Proposed Action alternative.

A total of 60 acres of manual and mechanical control measures would occur under Alternative 3, which would occur in various locations within the CFO management area. Because of project design measures, SOPs, mitigation measures, and small amounts of acreage of treatment that would occur annually in any watershed, there would not likely be a cumulative contribution to that would adversely affect fisheries, aquatic habitats, and special status fish species under Alternative 3. that no cumulative effects are possible.

4.4.5 Alternative 4 – No Action

Direct and Indirect effects

Although four more herbicides may be used compared to the Proposed Action, the direct and indirect effects to fishery resources are the same. Herbicide applications within sensitive areas (i.e., RCAs, within 100 feet of stream, and riparian areas) would be similar, and the continued application of herbicides on 800 acres would result in the same impacts as the Proposed Action.

Federally Listed and BLM Sensitive Fish

BLM effects determinations for ESA-listed fish, Idaho BLM sensitive fish, critical habitats, and EFH would be the same as for the Proposed Action alternative if the CFO continues herbicide use and other treatment methods as presently authorized. This includes aerial application of herbicides as well as manual and biological control methods. See Table 4-3 and BLM's rationale on pages 79-84 of this EA.

Cumulative Effects

Cumulative effects analysis for this alternative is the same as the Proposed Action alternative. Invasive plant control measures utilized under this alternative would result in similar cumulative impacts as the only difference is the use of four additional herbicides.

4.5 Wildlife and Special Status Wildlife

4.5.1 Proposed Action

Direct and Indirect Effects

Invasive Plants

Invasive plants have adversely impacted habitat for native wildlife in the CFO. As described in the vegetation section, invasive plants impact a variety of parameters in native plant communities including plant recruitment, plant diversity, plant age structure, etc. Grasslands and dry forest habitats are at higher risks for invasive plant infestations; however, all habitats are susceptible. Any species of wildlife that depends upon native understory vegetation for food, shelter, or breeding, is or can be adversely affected by invasive plants. Invasive plant species have become established and continue to spread rapidly, causing a loss of wildlife habitat and posing a risk of loss of critical habitat niches, forage, effects to prey species, and effects to species health and viability. Yellow starthistle infestations have severely degraded big game and other species habitat values in the dry canyon grassland habitats. Species restricted to very specific habitats, for example pond-dwelling amphibians or animals with small home ranges are more susceptible to adverse effects of invasive plants.

Although it is uncommon, some wildlife species utilize invasive plants for cover or food. Honeybees are known to use yellow starthistle quite extensively. Bees are important pollinators for other native vegetation including special status plants. Bighorn sheep will utilize cheatgrass (Csuti et al., 2001). While not preferred, it has been reported that elk, deer, and rodents eat rosettes and seed heads of spotted knapweed. Doves, humingbirds, honeybees, and the endangered southwestern willow flycatcher (*Empidonax trailii extimus*) are known to use saltcedar (Barrows 1996). American goldfinch (*Carduelus tristis*) and red-winged blackbird (*Agelaius phoeniceus*) will utilize purple loosestrife (Kiviat 1996, and Thompson, Stuckey, and Thompson 1987).

Even though some species will utilize invasive plants, the few uses that they may provide do not outweigh the adverse impact to an entire ecosystem (Zavaleta 2000). Displacement of native plant communities by nonnative plants results in alteration to the structure and function of ecosystems and a principle mechanism for loss of biodiversity at regional and global scales (Lacey and Olsen 1991). Mills et al. (1989) and Germaine et al. (1998) found that native bird species diversity and density were positively correlated with the volume of native vegetation, but were negatively correlated or uncorrelated with the volume of exotic vegetation.

Invasive plants can reduce available forage quantity or quality (Bendunah and Carpenter 1989, Rice et al. 1997, and Trammell and Butler 1995) and reduce preferred cover (Rawinski and Malecki 1984 and Thompson et al. 1987). Invasive plants can adversely affect wildlife species by eliminating required habitat components, including surface water (Brotehrson and Field 1987), Dudley 2000, and Horton 1977). Nonnative invasive plants also alter habitat composition due to altered fire cycles (D'Antonio and Vitousek 1992, Mack 1981, Randall 1996, Whisenant 1990).

Some invasive plants can cause physical injury, such as that caused by long spines or "foxtails" (Archer 2001). Invasive plants such as spotted knapweed contain chemical compounds that make the plant unpalatable to grazing animals. Chemical compounds in these invasive plants disrupt microbial activity in the rumen or cause discomfort after being ingested, resulting in a reduced or avoided consumption of the invasive plant (Olson 1999). There are also reports of small birds being entrapped in the mature flowering stalks of burdock plants and dying.

The Washington Department of Fish and Wildlife (2003) identified noxious weeds, such as yellow starthistle and knapweed, as threats to upland game bird habitat. State and federal agencies and wildlife managers are concerned that invasive plants are degrading critical habitats for deer, elk, and bighorn sheep. Trammell and Butler (1995) found that deer, elk, and bison avoided sites infested with leafy spurge. Tamarisk stands have fewer and less diverse populations of mammals, reptiles, and amphibians (Jakle and Gatz 1985 and Olson 1999). Invasion by purple loosestrife makes habitat unsuitable for numerous birds, reptiles and mammals (Kivat 1996, Lor 1999, Rwinski 1982, Thom, Stuckey, and Thompson 1987, Weihe and Neely 1997, and Weiher et al. 1996).

Potential effects to wildlife are influenced by the amount of habitat infested with invasive plants within a species home range or territory. Species with small home ranges and less mobile species would be at greater risk if a large portion of their daily or seasonal use area were populated by invasive plants. Conversely risks would be less for species with large home ranges or species that forage or travel over large areas because invasive plants would affect less of their available habitat.

In summary, invasive plants are known to directly or indirectly affect wildlife and wildlife habitats in a variety of ways which include:

- Lack of proper forage quantity or nutritional value at critical life periods
- Decrease of critical habitat and changed distribution of wildlife
- Alteration of habitat structure leading to habitat loss or increased chance of predation
- Changes to effective viable populations through nutritional deficiencies or direct physical mortality
- Poisoning due to direct or indirect ingestion of toxic compounds in invasive plants
- Altered food web, perhaps due to altered nutrient cycle
- Embedded seeds in animal body parts or entrapment (e.g. common burdock) leading to injury or death
- Scratches leading to infection

The Proposed Action provides a variety of applicable tools to respond to the existing invasive plant situation in the CFO. Cooperative planning with adjoining landowners, prevention practices to avoid introduction of weeds, an adequate array of herbicide tools to address existing and future weed threats, biological control tools as an alternative control method etc., provide managers with flexible options to address the issue of wildlife habitat degradation. Much of the CFO area provides good quality wildlife habitat. Availability of the suite of tools provided in the proposed action allows managers many options to protect this valuable habitat. Standard operating procedures and mitigation measures made a component of the Proposed Action also provide guidance to avoid, as much as possible, impacts associated with treatment of invasive plants. Although other herbicide tools were available for use in the PEIS, lack of their availability is not expected to impact successful invasive species control in the CFO.

Invasive Plant Treatment

Effects of invasive plant treatment methods to wildlife were evaluated and discussed in detail in the BLM *Final Programmatic Environmental Impact Statement – Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in the 17 Western States* (USDI-BLM 2007a, 2007b). Methods used to treat invasive plants have the potential to adversely affect individual animals as well as habitats. Invasive plant treatments may have short term adverse effects, but long term benefits would occur from reduction of invasive species and establishment of desirable plant species. Impacts of the proposed action to wildlife as a result of implementing treatments can be broken down into wildlife disturbance as a result of applying treatments and specific impacts of the particular treatment method.

Disturbance

The potential for disturbance to wildlife as a result of implementing invasive plant treatments depends partly on the location of the invasive plant infestation. For example treatments along roadsides would be less of an impact because these areas do not provide essential wildlife habitat and consist of long, narrow areas spread over large distances. Treatments occurring in recreation sites would also have less potential for impact because these areas have been disturbed by development activities and human uses and generally do not provide critical habitat for species. Conversely, treatments within remote areas would pose a greater risk to species sensitive to disturbance.

Riparian areas often receive a disproportionate amount of wildlife use and can contain important niche habitats such as cover or nesting components. Potential impacts in these areas would likely be greater than many upland sites. All alternatives include SOPs and mitigation measures to reduce potential impacts within specific habitats such as riparian areas. Also included in this guidance is direction to avoid treating vegetation during time-sensitive periods for wildlife.

Potential disturbance effects to wildlife vary depending on the species and extent of infestation, as well as the amount of native vegetation within infested areas. For example, treatment of a large infestation may create more disturbance for a longer period of time than treatment of a small infestation but potential effect to wildlife would be reduced because the presence of native wildlife in these areas is greatly reduced in comparison to native vegetation (Duncan and Clark 2005). Conversely, disturbance as a result of treatment in moderately infested areas may pose a greater risk to wildlife because these areas continue to support suitable habitat and are more likely to contain native wildlife. Small infestations would be expected to pose the least risk to wildlife because of the small amount of habitat affects.

Important big game winter range, spring range, or yearlong habitat for elk, mule deer, and bighorn sheep that occur in canyon grassland habitats (e.g., Salmon River, Snake River, etc.) would be priority areas for invasive plant treatments. Short term disturbance and displacement would occur from treatments occurring in spring and early summer. Short term minor reductions to forage may occur; however, long term benefits would occur from improved habitat quality with a reduction in invasive species.

Herbicide Impacts

Direct impact of herbicides to wildlife due to their toxicity is often one of the first things that come to mind when considering herbicide use. When assessing the effects of herbicides on wildlife species, it is important to note that herbicides affect plants at relatively low rates, while much higher rates would be required to kill animals. It is also important to note that plants have metabolic systems that do not exist in animals. It is these metabolic systems at which the herbicides are targeted. Michael (2002) identified that “All chemicals, natural or man-made, are toxic at some level of exposure.” The difference between acute and chronic toxicity versus the no observe effect level (NOEL) is primarily a function of the amount of exposure in a unit of time and the mode of action of the chemical. Results of numerous field studies indicate that the likelihood for direct effects to wildlife from herbicide use is low (e.g., Marshall and Vandruff

2002, Dabbert et al. 1997, Fagerstone et al. 1977, Rice et al., 1997, Sullivan et al. 1998, Cole et al. 1997, Cole et al. 1998, Johnson and Hansen 1969, Nolte and Fulbright 1997, McMurray et al. 1993a, McMurray et al. 1993b.). Amphibians may be more sensitive to herbicide use as some malformation or mortality has been reported when they were exposed to herbicides or surfactants in water (Relyea 2005). Surfactants added to herbicides could substantially increase toxicity to aquatic species, like amphibians. However, using aquatic approved surfactants as described in the proposed action would minimize or reduce that risk. Potential concerns in relation to direct effects of herbicide use to wildlife include impact to vital organs, changes in body weight, reduction in the number of healthy offspring, and increased susceptibility to predation. The PEIS noted that birds or mammals that eat grass that has been sprayed with herbicides have relatively greater risk for harm than animals that eat other vegetation or seed, because herbicide residue is higher on grass (Fletcher et al. 1994; Pleeger et al 1996). This phenomenon is apparent with large mammalian herbivores in the BLM risk assessments. Grass foragers might include deer, elk, rabbits and hares, chukar, quail and geese (USDA Forest Service 2005).

For nine of the ten AIs included in the proposed action, the PEIS found no risk or low risk to wildlife for all modeled exposure scenarios at typical rates. 2,4-D had moderate risk when directly sprayed on a small animal and honeybee with 100% adsorption, moderate risk when a large mammal or bird consumed contaminated grass, and moderate risk when a small mammal consumed contaminated insects. 2,4-D also had a high risk if a small bird ate contaminated insects or a predatory bird consumed fish that were contaminated during a spill scenario(PEIS Table 4-22, and 4-23). The risk assessment indicates that insectivores and large herbivores eating large quantities of grass and other vegetation are at risk from routine exposure to 2,4-D used over large areas, suggesting that 2,4-D should not be applied over large application areas where foragers would only consume contaminated food. As described in the proposed action, 2,4-D is often used later in the season or as a specific treatment of a target weed. Table 2-6 shows that from 2007 to 2010 as a percent of total treatment acres, this herbicide accounted for as little as 1% (4 acres) and as much as 8% (21 acres) across the entire CFO in any given year. The CFO is not applying 2,4-D over large areas.

Following are additional key factors regarding toxicity summaries and assumptions:

- Exposure scenarios do not account for factors such as timing and method of application, animal behavior and feeding strategies, seasonal presence or absence within a treatment area, or implementation of project design features and therefore exaggerate risk when compared to actual applications proposed in this EA.
- BLM lands within the CFO management area are scattered and intermingled with private and other state and federal land agency lands. Acreage of herbicide use proposed by BLM within any 6th code HUC watershed comprises a small percentage of the watershed. In relation to acres of BLM proposed treatment, only one 6th code HUC is over one percent (1.2 percent - Snake River – Cache Creek), and the majority of treatments are less than 0.5 percent. Consequently, disturbance of wildlife species would be minimized, habitat affected is generally negligible, and primarily only short term effects would occur as suitable habitat exists for displaced/disturbed wildlife.

- Aquatic organisms such as frogs would have the same sensitivity to herbicides as fish. All herbicides in the proposed action are generally excreted rapidly (often within 24-48 hours) and do not bio-accumulate

Indirect effects to wildlife from herbicide use center on habitat modification. Herbicide use may result in minor and temporary effects on plant communities and wildlife habitats following single applications, including the beneficial effects of reduction of invasive species. As described in the vegetation section, broadleaf herbicides would remove desirable native forbs along with target broadleaf weed species. This is of greater concern where treatment areas are large in size or with the use of broadcast treatment over large areas. Forage species and wildlife use of treated areas are likely to recover two to several years after treatment (Escholz et al. 1996, McNabb 1997, Miler and Miller 2004). Potential for adverse effects are minimized with the small amount of acreage proposed by the BLM for treatment in a watershed during a single year. It is not expected that with the program set out in the proposed action, large scale habitat modification due to herbicide use would occur. In addition, project design features, SOPs and mitigation measures include such things as spot treatment in sensitive areas in order to reduce non-target vegetation impacts and the ability to select herbicides such as clopyralid that do not impact shrubs and have less non-target impacts in some situations.

Manual Control Impacts

Very small acreages would be treated with manual control under any alternative resulting in negligible overall effects to wildlife species and habitat. Manual methods are labor-intensive and usually ineffective for the treatment of large, well-established infestations of perennial invasive plants with long term viable seeds such as knapweeds (Brown et al. 1999). Manual treatments can result in trampling of nontarget plants and less mobile animal species. Since manual treatments may take more time or repeated treatment visits to be effective, disturbance or displacement of wildlife may be higher than with other methods. Manual control can also create small localized areas of bare ground. The degree of threat and effect from manual treatments depends on the number of workers present and the size of the area being treated. Because manual techniques are slower than mechanical or chemical methods, the duration of disturbance may be longer in the treatment area. However the slower pace of work allows animals in the area to leave and reduces the risk of direct harm from trampling. Manual treatments and resultant soil or vegetation impacts are likely to be patchy in distribution and the potential effect to habitat is considered discountable.

Biological Control Impacts

Impacts to wildlife as a result of implementing biological control would be primarily due to human presence causing disturbance during release of the agents or post release monitoring. There are no adverse effects related to biological control to wildlife anticipated under the proposed action. A reduction of invasive plant species using biological control is beneficial to habitats and would reduce risks associated with using herbicides. Biological control is often viewed as a progressive and an environmentally friendly method to control invasive plants because it leaves behind no chemical residues. When successful, it can provide essentially permanent, widespread control with a very favorable cost-benefit ratio. For example, BLM bio-control releases on yellow starthistle have shown positive control results at some sites within the CFO management area. Additional information on the efficacy of biological control agents can be found in the invasive species effects discussion.

Use of biological control insects would not result in any adverse effects to wildlife habitats, because non-target vegetation is generally not affected. Control of invasive plant species may result in short term loss of ground cover, but removed plants would be replaced by desirable species in the long term with more benefits for habitats, soil stabilization, and prevention of erosion/sediment. Long term benefits would occur to wildlife habitats with a reduction of invasive species, and establishment of plant species that provide for improved bank stability, shade, and potentially improved habitat for food sources.

One example of where an effective biological control has impacted wildlife species is the Southwestern willow flycatcher. The flycatcher was utilizing the invasive plant saltcedar as a replacement habitat in the absence of native vegetation. A biological control agent introduced to control saltcedar was so effective that it reduced the canopy of the plant over large areas and essentially altered the flycatcher habitat. This example is not applicable in the CFO, as whole scale habitat conversion to non-native species has not occurred. Also, native vegetation is still a component of most vegetative communities and the defoliation of one plant species would not cause complete habitat modification.

Neotropical Migratory Birds

The proposed action and alternatives have the potential to result in short term minor adverse effects and beneficial affects to migratory birds. Impacts already discussed in relation to wildlife disturbance, toxicity of herbicides and habitat modification as result of treatments are applicable to neotropical migratory birds. Risks from herbicide use may be somewhat higher for small bird species that feed exclusively on insects in a treated area particularly in canyon grasslands or open habitats where herbicide use may be more likely. Many high priority migratory birds utilize riparian habitats and forested areas. Herbicide treatment in these areas would be limited to selective spot treatments of target invasive species and no aerial applications would occur. Project design measures, SOPs and mitigation measures for invasive plant treatment is expected to minimize potential for adverse herbicide exposures to the species and habitats. Manual and mechanical treatments would occur in small localized areas and are not expected to have overall adverse effects to the species or habitats. Biological control measures are expected to have discountable impacts because non-target vegetation is generally not affected and disturbances are minimal and short term only during treatments. Overall impacts associated with invasive plant treatments would be low or minimal and primarily result from disturbance effects. These birds have the ability to move and may be temporarily displaced in the short term during treatment activities. The short term effects from disturbance and habitat alteration and potential low level exposure risks would be out-weighed by the long-term benefits from a reduction in invasive species and habitat improvements.

ESA Listed and Candidate Species

Canada lynx – The proposed action "*May Affect, but is Not Likely to Adversely Affect"* Canada Lynx. There are no known occurrences of lynx on BLM lands and no BLM lands occur within one mile of any known occupied den. However, lynx analysis units and suitable habitat do occur on BLM lands. These areas could have a minor amount of invasive plant treatment, as a result there could be some potential for disturbance to lynx or prey species. Lynx are unlikely to be exposed to herbicides because any appreciable exposure would require the lynx to feed upon prey that had been feeding exclusively within a treatment area or had been directly sprayed. This scenario is highly unlikely. Manual and biological control measures are expected to have discountable potential or no effect to lynx, habitat quality or prey species.

Northern Idaho Ground Squirrel - The proposed action *"May Affect, but is Not Likely to Adversely Affect"* Northern Idaho ground squirrel. There are no known occurrences of this species on BLM lands in the CFO and there are minor amounts of suitable habitat. Should this species be documented in suitable habitat in the future and the site is treated, the potential does occur for some disturbance and some potential to impact habitat. No adverse harassment or potential for mortality is anticipated to result from any currently planned weed treatment activity.

Yellow-billed cuckoo – The proposed action may impact individuals or habitat, but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species. There are no known occurrences of this species and there is a minor amount of suitable habitat on BLM lands in the CFO. Potential does occur for some disturbance if suitable habitat is treated or occurrence documented on BLM lands in the future.

Wolverine - The proposed action may impact individuals or habitat, but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species. Potential use areas are primarily associated with higher elevations in the Marshall Mountain area. There is limited potential for invasive plant establishment and resultant treatment in wolverine habitat.

BLM Idaho Sensitive Wildlife

In relation to the animals on BLM Idaho's sensitive animals list (Appendix 2), with the exception of the four species listed below, the proposed action *"may impact individuals or habitat, but would not likely lead to a trend toward federal listing or cause a loss of viability of the population or species"*. The proposed action would have no impact on the coast mole, American white pelican, shortface lanx or Columbia pebblesnail. Impacts from the proposed action are the same for BLM Idaho sensitive wildlife as those which were already described for general wildlife above. Species utilizing grasslands and more open habitat types would be more prone to disturbance or effects from treatment because these areas are where a majority of invasive plant treatments would occur. Implementation of the SOPs, mitigation measures and design features in the proposed action further protect sensitive wildlife.

Cumulative Effects

Timeframes for cumulative effects analysis for wildlife are consistent with those in previous sections and are twenty years in the past and ten years into the future. In relation to the proposed action, the primary factor affecting wildlife populations center on habitat modification as described in the cumulative effects discussion in the vegetation section. For species with small home ranges and limited ability to disperse, cumulative effects would include the project area or affected watershed. However, for species that are highly mobile or migratory, the cumulative effects analysis area includes all lands within the CFO management area. Foreseeable future actions that may occur to impact wildlife resources include herbicide application on private and State lands.

Past, present, and foreseeable future actions have and will continue to contribute to the establishment of invasive weeds. Cooperative weed management areas and counties have active programs to treat invasive plants and laws to require private property owners to control invasive plants on their property. Herbicides are commonly applied on private lands for a variety of agricultural and invasive plant management purposes. Other actions include a variety of ongoing land uses which have the potential to impact upland and riparian habitats, which include livestock grazing, timber harvest, road use and maintenance, road construction, restoration actions, prescribed burning, and urban and rural development. Herbicide treatments occur on state, FS, tribal lands, other federal lands, county, cities/towns, private lands, forestry lands, rangelands, utility corridors, road rights-of-ways, and recreation sites. Because wildlife move and migrate, some species could be exposed to herbicides on adjacent land or along their migration routes. Species could be exposed to the same herbicide on multiple ownerships, or a combination of different herbicides. Wildlife could also be exposed to other chemicals, such as insecticides, rodenticides, fungicides, and others. The herbicides proposed for use do not significantly bio-accumulate (USDA-Forest Service 2005, USDI-BLM 2007a, b). For additive doses to occur, two exposures would have to occur at approximately the same time. The application rates, acres treated, and extent considered in this EA are unlikely to result in additive doses beyond those evaluated for chronic exposures in the various Forest Service and BLM risk assessments, which formed the basis for the effects analysis in the BLM Final EIS (USDI-BLM 2007a, b).

Project design measures, SOPs and mitigation measures provide a degree of protection for special status wildlife, important habitats, and sensitive resources on BLM lands such as RCAs, riparian areas and water. Wildlife and critical habitats may be more vulnerable on other ownerships where protective measures are unknown. Potential herbicide treatments that could affect wildlife and non-target vegetation on BLM lands would occur on a very small area it is unlikely that any proposed treatment would measurably contribute to any other activities on private lands that would result in significant effect to wildlife. The overall positive effect of reducing target invasive plant infestation and maintaining native plant habitats and diversity is greater than potential impacts to non-target wildlife and habitats.

Table 4-2 (see page 77 of this EA) displays the distribution of invasive plant treatments by subbasin. Herbicide treatments may potentially occur within 83 6th code HUC watersheds, occurring in eight subbasins. The maximum potential that would occur within any 6th code HUC annually was estimated to be 1.2 percent (Snake River – Cache Creek), and this watershed included face drainages of the Snake River. The next highest watershed was Snake River – Corral Creek (0.925 percent) and herbicide treatments would occur in Corral Creek and Snake River face drainages. The remaining herbicide treatments were all estimated to be less than 0.5 percent, with many less than 0.1 percent

A total of 800 acres of herbicide application is estimated to occur under the proposed action, which would occur in various locations within the CFO management area. Because of project design measures, SOPs, and small amounts of acreage of treatment that would occur annually in any watershed, there would not likely be a contribution to cumulative wildlife, habitat, and special status species impacts under the proposed action. Changes to wildlife habitat from loss of target and/or nontarget vegetation are predicted to be minor so that no cumulative effects are expected. Potential for cumulative adverse residual effects to wildlife from herbicide treatments occurring in the same area would be expected to be low risk and discountable because of the small amount of acreage treated, herbicide application rates, and project design measures. Herbicides are general excreted rapidly (often within 24-48 hours) and do not bio-accumulate.

4.5.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect Effects

This alternative is the same as the Proposed Action with the exception of eight more herbicides that may be used. Invasive plant treatment techniques, treatment acreage, application methods, project design features, SOPs and mitigation measures are identical to the proposed action. Risk assessments for the eight additional AIs did not denote any particular additional risk to wildlife. Bromacil and diuron are non-selective and broad spectrum herbicides that could impact wildlife habitat if used over large areas. It is unlikely they would be used in volume enough to impact wildlife or in areas critical to wildlife resources. There may be slight advantage in having more herbicide tools available, particularly if herbicides useful against plants impacting riparian or aquatic habitats become established in the CFO. Hexazinone may be a helpful tool to implement forest habitat treatments that may benefit wildlife. Impacts to wildlife from this alternative are essentially identical to the proposed action in relation to disturbance and treatment.

Impacts and determinations for ESA-listed wildlife, Idaho BLM sensitive wildlife, and neotropical migratory birds would be the same as identified for the Proposed Action.

Cumulative Effects

Invasive plant control measures utilized under this alternative would result in similar cumulative impacts as those described for the Proposed Action. The use of eight additional herbicides would not change the cumulative effects analysis.

4.5.3 Alternative 2 – No Aerial Application

Direct and Indirect Effects

This alternative would result in one-half the proposed treatment acres and no use of aerial herbicide applications. The direct and indirect effects related to disturbance from ground based treatment, impacts of the herbicide AIs, manual, and biological treatment are similar as described for the Proposed Action. Since this alternative would not allow the use of aerial application methods there would be no herbicide treatments in uplands that are infested with invasive plants where aerial application is the only practical method. There is no difference between this alternative and the Proposed Action as far as acreage treated in riparian habitats and RCAs as treatment in these areas are primarily ground-based.

This alternative results in less potential for disturbance and exposure to herbicides for wildlife species utilizing canyon grassland habitats as this is where most aerial application would take place. Consequently, habitats for these species may continue to degrade with invasive plant encroachment. This alternative would eliminate the potential for impacts to riparian areas, water bodies and other sensitive resources such as ESA listed plant populations as a result of off-site drift from aerial applications on upland habitats. Without the use of aerial spraying large areas of vegetation would remain untreated under this alternative, which could lead to continued or future degradation of uplands habitats to the detriment of wildlife relying on those areas.

Impacts and determinations for ESA-listed wildlife, Idaho BLM sensitive wildlife, and important habitats would be the same as identified for the Proposed Action alternative as treatment could still occur in habitats supporting the species. There would be less potential impact from treatment activities to species occurring in canyon grasslands areas although there would be potential increase in continued habitat alteration from invasive weed species.

Cumulative Effects

A total of 400 acres of herbicide application is estimated to occur under Alternative 2, which would occur in various locations within the CFO management area. Because of project design measures, SOPs, mitigation measures and small amounts of acreage of treatment that would occur annually in any watershed, there would not likely be a contribution to cumulative adverse impacts to wildlife or habitats, including special status species. Given the way animals metabolize the herbicides proposed under this project, chronic, lingering impacts are unlikely (BLM 2011).

4.5.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

A total of 60 acres of manual and mechanical invasive plant control measures would be implemented under this alternative. Under this alternative no BLM lands would be treated with herbicides or biological control. Since 740 fewer acres would be treated compared to the Proposed Action alternative, there would be a corresponding reduction in potential wildlife disturbance as a result of treatment activities. This alternative also removes any potential effect from herbicide exposure to wildlife species or habitats. Since biological controls are likely to be released on other land ownerships in the vicinity of BLM lands, it is likely those agents would move to target weed infestations established on BLM lands.

Mechanical methods generate more noise than other treatments, except for aerial application, and have a higher potential of disturbing species that are secretive or sensitive to noise. Steep and rugged topography restricts use of this type of control method/machinery over a large percentage of the CFO management area. Primary use would occur in old agriculture areas, along roads, and in moderate sloped or open areas. Use of mechanical control tools and machinery has the potential to create noise above background levels that may disturb wildlife. Because disturbance related effects would only occur during treatment, effects to wildlife would be short-term in nature. Use of vehicle-mounted mechanical equipment (mowers, plows, rangeland drills, etc.) is much less selective and more likely to directly harm small wildlife species. Mechanical treatments may crush small mammals, reptiles, amphibians, or eggs of ground-nesting birds resulting in mortality to less mobile species and destruction of nests in treatment areas. Vehicle-mounted equipment would most often be used to treat monocultures of invasive plants on gentle slopes along roads and these areas do not provide preferred or suitable habitat for most native wildlife although adverse effects from disturbance or crushing are still possible. Hand-held mechanical equipment like string trimmers and chainsaws can be used very selectively to target plants and may be less likely than larger equipment to directly harm wildlife.

Mechanical treatments may produce more bare ground, reducing cover, exposing more soil to erosion, potentially disrupting dispersal or foraging patterns of small animals and exposing some species to increased predation as a result of decreased cover. These treatments often may be used in conjunction with other site restoration treatments (seeding, plantings); consequently, the loss of cover would be short-term (1 to 2 growing seasons).

This alternative would be the least effective at providing BLM the tools to adequately respond to habitat degradation as a result of invasive weed species and meeting the purpose and need of the project. Consequently, there would be fewer benefits to special status wildlife, other wildlife species, and wildlife habitats that are degraded by non-native plant species. If other treatment methods such as mechanical treatments were used to control weeds in wildlife habitats instead of herbicides, the disturbance to habitat could be greater in small localized areas. Mechanical methods result in more soil and vegetation disturbance. Mechanical equipment used to implement treatments, such as tractors, result in more noise and potentially a higher level of wildlife disturbance. However, sites where this method would be used are generally heavily infested with invasive plant species as a result of past land uses (e.g., old agriculture areas). Because of the small acreage treated with manual or mechanical methods and the existing condition of these sites (poor ecological condition), the overall effects of mechanical treatment are considered to be negligible. Long term benefits would occur from reduction of invasive species at these sites.

ESA-Listed and Candidate Species

Implementation of manual and mechanical invasive plant control measures on 60 acres under Alternative 3 would have "*No Effect*" to ESA listed Canada lynx or northern Idaho ground squirrel. This alternative would have "*No Impact*" to ESA candidate species yellow-billed cuckoo or wolverine.

Idaho BLM Sensitive Species

In relation to Idaho BLM sensitive wildlife species, this alternative would have "*no impact*" to all but the nine listed below. This alternative "*may impact individuals or habitat, but will not likely lead to a trend toward federal listing or cause a loss of viability of the population or species*" of Bald Eagle, Peregrine falcon, prairie falcon, mountain quail, Brewer's sparrow, common garter snake, western toad, woodhouse toad, or lava rock mountain snail. These species typically nest or otherwise rely on habitat that could be treated with mechanical methods.

Cumulative Effects

Implementation of sixty total acres of treatment in the CFO area is highly unlikely to contribute to any negative cumulative effects in relation to wildlife. The lack of tools to respond to invasive plant impacts to wildlife habitat could contribute to cumulative negative impacts as a result of wide scale habitat modification. BLM would not be able to participate effectively in invasive plant management projects aimed at eradicating new invasive species and reducing the potential spread of existing species.

4.5.5 Alternative 4 – No Action

Direct and Indirect Effects

This alternative is the same as the Proposed Action with the exception of five more herbicides that may be used and one herbicide that is not available for use. Invasive plant treatment techniques, treatment acreage, application methods, project design features, SOPs and mitigation measures are identical to the Proposed Action. Risk assessments for the five additional AIs did not denote any particular additional risk to wildlife. Bromacil and diuron are non-selective and broad spectrum herbicides that could impact wildlife habitat if used over large areas. It is unlikely they would be used in volume enough to impact wildlife or in areas critical to wildlife resources. There may be slight advantage in having more herbicide tools available. Hexazinone may be a helpful tool to implement forest habitat treatments that may benefit wildlife. Unfortunately this alternative does not allow for the use of imazapic which would be useful in leafy spurge treatment and restoration of habitats infested with annual grass species. Impacts to wildlife from this alternative are essentially identical to the Proposed Action in relation to disturbance and treatment.

Impacts and determinations for ESA-listed wildlife, Idaho BLM sensitive wildlife, and neotropical migratory birds would be the same as identified for the Proposed Action.

Cumulative Effects

Invasive plant control measures utilized under this alternative would result in similar cumulative impacts as those described for the Proposed Action. The use of five additional herbicides and the lack of one herbicide active ingredient would not change the cumulative effects analysis.

4.6 Soils

4.6.1 Proposed Action

Direct and Indirect Effects

Weed invasion impacts soils. Studies have shown that sites dominated by spotted knapweed display substantially higher surface water runoff and stream sediment yield than comparable sites dominated by native perennial bunchgrasses (Lacey et al. 1989). Cheatgrass dominance and associated fires also reduce biological soil crusts, which affect nutrient cycling, water infiltration, and potential soil erosion (Belnap et al. 2001). Less is known about the impact wholesale vegetation community changes have on soil biota and nutrient cycling. An example of where this change has taken place is in lower elevation canyonlands where the formerly Pacific bunchgrass perennial plant community has changed to one that is primarily annuals such as various annual bromes, ventenata and yellow starthistle. It is often difficult to revegetate these areas with desired species. One factor impacting these projects could be a shift in the soil biologic communities from those which occupied the site pre-weed invasion. Although very little research has been done on the restoration of soil biological communities, it stands to reason that large persistent invasive plant infestations, particularly annuals, would detrimentally effect the re-establishment of soil biota and native perennial plant communities. A study on arbuscular mycorrhizal fungi found that in areas dominated by spotted knapweed there was change in both community composition and abundance of fungi from those found in adjacent native plant communities (Mummey and Rilling 2006).

An integrated weed control program could potentially affect soils by altering their physical, chemical, and/or biological properties. Changes could include loss of soil through erosion due to short-term removal of vegetative cover or changes in soil structure, porosity, or organic matter content. Herbicides routinely contact soils during application, either intentionally for systemic treatments, or unintentionally as spills, overspray, or spray drift. Contact may also occur as a result of herbicide transport through plants to their roots where herbicide may be released into soil (BLM 2007a). Herbicides can change the composition of soil microbes. Many herbicides provide food for soil microorganisms which in turn promote the breakdown of the herbicide. Repeated use of the same herbicides on the same area can increase the relative numbers of the microbe for which the herbicide is food. There is no known detrimental impact of this relationship as once the herbicide is depleted in the system, there is a corresponding decrease in the dependent organism. It is also not standard practice to repeatedly treat the same area with the same herbicide yearly in the CFO. Herbicide active ingredients are routinely varied so weed herbicide resistance does not become a problem. Also, weed targets are often different on a piece of ground from year to year leading to the use of a different herbicide. There is little concern for large areas of bare ground and potential for soil erosion as larger areas of treatment would be accomplished with selective herbicides that leave grasses in place to provide ground cover. Treatment to be accomplished with non-selective herbicides such as glyphosate treatments within fifteen feet of water would be spot-treatments and not likely to result in areas of bare ground large enough to result in increased sedimentation. The impact of two glyphosate herbicides on intact biological soil crusts show the herbicide had no short term negative impact on moss-dominated biological soil crusts (BLM 2001). Level of impact of herbicides to the moss dominated crusts found in the CFO is likely to be dependent on timing. Most herbicide treatments would be occurring when soil surfaces are dry. Because biological soil crusts are most active when moisture is readily available due to rain or high humidity levels, the period of herbicide application and biologically active soils crusts are not likely to coincide. It is not expected that there would be an increase in soil compaction. Repeated overland travel of application equipment to the same piece of ground, particularly when soils are wet is unlikely to occur. It is not expected that soil organic matter would be appreciably changed. Treatments would not result in large changes in the amounts of vegetative material on site.

Soil disturbance associated with manual treatments is likely to be minimal and would not require rehabilitation efforts due to the small area affected. There are no impacts of concern for use of biological agents as their activity generally does not cause a fast change in vegetative cover leading to bare ground and it is not expected that they would have any impact to soil chemical or biological properties.

Over the long term, treatments that remove invasive vegetation and restore native plants should enhance soil quality on public lands (BLM 2007a). The proposed action alternative would increase flexibility in treatment options particularly with regard to cheatgrass, and should therefore have an increased beneficial impact on soil quality and biocrusts compared to the no action and alternative 3, no herbicide or exotic biological control alternatives.

Cumulative Effects

In relation to soil resources, for all alternatives the general geographic scope for cumulative effects discussion is the FO area. The timeframe for analysis is twenty years in the past and ten years in the future.

Past and present actions that have contributed to cumulative effects for soil resources center around land use changes. These changes have had impacts in relation to soil erosion rates and somewhat to changes in soil properties such as compaction and fertility. Largescale, conversion of the Camas and Palouse prairies to agriculture have led to increases in soil erosion rates. In addition, some land uses such as road building, domestic livestock grazing and timber management have the potential to impact erosion rates. Changes in soil organic matter is also more likely influenced by agricultural practices.

Reasonably foreseeable actions would be the continued cropping of agricultural lands as well as periodic timber harvest and land uses occurring on private, state and other federal lands in the area.

It is not expected that the proposed action would contribute to cumulative impacts in relation to soil resources. There would be discountable potential for changes to soil erosion rates or changes to soil properties when paired with other actions.

4.6.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect Effects

The addition of more herbicides to the list of potential list of herbicides should not have any additional effects. The effects are the same as the Proposed Action.

Cumulative Effects

The effects are the same as the Proposed Action.

4.6.3 Alternative 2 – No Aerial Application

Direct and Indirect effects

Weed management methods utilized under this alternative would potentially cause greater negative impacts to soils if it resulted in increased use of ground-based treatment methods, which by their nature lead to greater soil disturbance than aerial application methods. Although the majority of herbicide treatments during the next 10 years would likely involve use of ground-based methods, this alternative could result in fewer acres treated if it proves unfeasible to treat areas that have been identified for aerial application via other methods. Weeds would continue to negatively impact soil resources in untreated areas. Cheatgrass could increase in density and extent if untreated, leading to loss of biological crust and increased soil erosion over extensive areas of low elevation rangeland.

Cumulative Effects

Cumulative effects would essentially be the same as the Proposed Action. Loss of aerial application would not change the analysis.

4.6.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

Increased mechanical treatment under this alternative has the potential to result in increased erosion and sediment delivery to water in relation to the other alternatives. No herbicide treatment and lack of biological control agents would result in less acres of weed treatment. Elevated rates of soil erosion from infested sites would be likely to continue at levels higher than those in the other alternatives.

Cumulative Effects

Although there is some potential for increase in erosion rates over the levels in other alternatives, it is not expected that there would be noteworthy changes in cumulative effects analysis.

4.6.5 Alternative 4 – No Action

Direct and Indirect Effects

Weed management methods utilized under the no action alternative would result in impacts to soils similar to those described for the proposed action alternative, with the exception of those occurring from herbicide use. This alternative would likely provide fewer potential benefits to soil resources. There would be fewer options in choosing herbicides to provide satisfactory weed control while maintaining healthy native vegetation communities. There would also be reduced capability for cheatgrass treatments using imazapic, possibly leading to larger areas dominated by cheatgrass. Cheatgrass expansion is associated with loss of biological crust (Belnap et.al, 2001), increased soil erosion, and altered fire regimes. More frequent fire and loss of native perennial vegetation would further increase the risk of soil erosion.

Cumulative Effects

Cumulative effects analysis is essentially the same as the Proposed Action.

4.7 Native American Tribal Uses

Common to all alternatives, discussions would be held with Native American tribes to determine which plants that could be affected by proposed herbicide treatments have traditional lifeway values, and whether there are specific, traditional collecting areas in or near proposed treatment areas. This is a SOP as outlined in the PEIS ROD.

4.7.1 Proposed Action

Direct and Indirect Effects

The population of traditional native plants is at risk because of the rapid spread of the weed species. This in turn impacts wildlife resources and increases surface erosion. Treatments of plants that are important for maintaining traditional lifeways may need to be modified or cancelled in certain areas. On the other hand, there could be long term benefits associated with treatments, such as reduction or elimination of non-native or invasive plant competitors, which would allow proliferation of traditionally used native species. Depending on the selected application method for herbicide treatment plans, the BLM might be unable to avoid plants identified by Native American tribes as being important in traditional subsistence, religious, or other cultural practices. Certain chemical treatments could also pose a possible health risk, through residues left on plants used as traditional foods or for ceremonial purposes, or as a result of contaminating other food sources or drinking water. However, following the mitigation measures and SOPs outlined in the PEIS ROD will reduce the potential impacts.

Cumulative Effects

There would be long-term effects associated with enhancing culturally significant plant and animal habitat as well as improving vegetation cover in limited areas. There could be short-term impacts to Tribal cultural uses due to loss of access during treatment. There could be long-term impacts due to ground disturbance associated with treatments or the effects of chemicals. Vehicles taken off-road to apply chemicals may cause damage to traditional plants. Because of the amount of acres treated each year and depending upon the available resources allocated to weed reduction, weed population may continue to grow and traditional plants that are important for maintaining traditional lifeways may continue to diminish.

4.7.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect Effects

The addition of more herbicides to the list of potential list of herbicides should not have any additional effects. The effects are the same as the Proposed Action.

Cumulative Effects

The effects are the same as the Proposed Action.

4.7.3 Alternative 2 – No Aerial Application

Direct and Indirect Effects

The effects are the same as the Proposed Action except only about half the number of acres (400) may be treated.

Cumulative Effects

The effects are the same as the Proposed Action except only about half the number of acres may be treated.

4.7.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

Increased use of manual and mechanical methods to control weeds may result in unintended impacts to traditionally used plants.

Cumulative Effects

Less herbicide treatment and lack of biological control agents will result is less weed treatment and this may allow traditionally used plants that are important for maintaining traditional lifeways to continue to diminish because fewer acres would be treated. The number of acres with encroaching weeds would increase leading to fewer traditional plants available for use.

4.7.5 Alternative 4 – No Action

Direct and Indirect effects

The effects are the same as the proposed action.

Cumulative Effects
The effects are the same as the proposed action.

4.8 Cultural Resources

Common to all alternatives, treatments would follow standard procedures for identifying cultural resources, in compliance with Section 106 of the National Historic Preservation Act, as implemented through the Nationwide Programmatic Agreement and state protocols. The process includes necessary consultations with the State Historic Preservation Office and interested tribes and/or the Tribal Historic Preservation Office as projects are planned. The BLM's responsibilities under these authorities are addressed as early in the vegetation management project planning process as possible. This is a SOP as outlined in the PEIS ROD.

4.8.1 Proposed Action

Direct and Indirect Effects
Herbicide treatments may affect buried organic cultural resources. The effect of herbicide treatments on cultural resources depends on the method of herbicide application and the herbicide type used. Some chemicals can cause soil acidity to increase, which would result in deterioration of artifacts or other organic matter associated with the cultural sites. Application of chemical treatments can also result in impacts such as altering or obscuring the surfaces of pictograph or petroglyph panels and organic materials. Substances could interfere with the radiocarbon or Carbon 14 (C-14) dating of a site or interfere with protein residue analysis on artifacts. Use of vehicles off designated routes to apply herbicides may affect surface artifacts or features. These sensitive areas will be identified separately. If weed treatments are planned for these sensitive areas, they will be implemented by techniques that do not require vehicle travel off road.

Manual removal of weeds by pulling or digging has the potential to affect cultural resources. Some cultural resources are on the ground surface or immediately under the surface and pulling or digging weeds may result in an adverse effect. A majority of hand pulling that would occur as a result of implementing the proposed action would take place on sandy beach areas along the Salmon River below the mean high water line. Implementing these treatments would not have adverse effects as the deposited sand from the river does not contain cultural resources in context. The primary areas of cultural resource concern are on slopes less than 30 percent, such as alluvial fans or terraces. Should hand pulling or digging be required above mean-high water, the site would be assessed as to potential for important cultural resources and cleared for treatment prior to implementation. There are no known impacts from biological control agents or chopping plants.

The spread of weed species sometimes leads to increased surface erosion since native plants are no longer present. The encroachment of weeds in the area may lead to artifact exposure on the surface. This in turn leads to greater soil erosion on cultural resources and artifacts exposed on the surface that may witness unauthorized collection and/or loss of context.

Restoring native plants should decrease surface erosion. However, in some cases, the spread of weed species (e.g. those with sharp spikes) has reduced the amount of recreation use and associated impacts. This has led some cultural resources to improved condition. Following the

SOPs and mitigation measures from the PEIS ROD will reduce the potential impacts to cultural resources.

Cumulative Effects

It is not anticipated that there will be substantial cumulative effects to cultural resources from the proposed action. Restoring native plants should decrease exposure of surface artifacts and decrease surface erosion which will benefit cultural resources. Removal of weeds on some cultural sites will actually increase impacts from other resources such as increased recreation use. Manual removal of weeds may have potential for disturbing cultural resources and may have the greatest long-term cumulative effect; however, prior review of manual control proposals will lessen this possibility.

4.8.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect Effects

The addition of more herbicides to the list of potential list of herbicides should not have any additional effects. The effects are the same as the Proposed Action.

Cumulative Effects

The effects are the same as the Proposed Action.

4.8.3 Alternative 2 – No Aerial Application

Direct and Indirect effects

The effects are the same as the Proposed Action except only about half the number of acres may be treated.

Cumulative Effects

The effects are the same as the Proposed Action except only about half the number of acres may be treated.

4.8.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

Increased use of manual methods to control weeds may result in increased impacts to cultural resources. An increased mechanical treatment under this alternative has the potential to damage cultural resources or expose unknown cultural resources. Less herbicide treatment and lack of biological control agents will result is less weed treatment and this may allow continued erosion on cultural sites and exposure of artifacts leading to a downward trend in condition. No herbicide treatment may benefit cultural resources by less chance of contamination to artifacts or organic material in cultural sites.

Cumulative Effects

More manual and mechanical treatments under this alternative may affect cultural resources and lead to greater cumulative impacts.

4.8.5 Alternative 4 – No Action

Direct and Indirect Effects

The effects are the same as the proposed action.

Cumulative Effects
The effects are the same as the proposed action.

4.9 Human Health/Recreation Use

4.9.1 Proposed Action

Direct and Indirect Effects
When considering impacts to human health from weed control, the hazard from using chemicals is often the first thing that comes to mind. In reality, workers are at more of a daily risk from accidents traveling to and from work sites or injuries related to working in steep rugged terrain and in elevated summer temperatures. The weeds themselves pose a hazard as many are toxic through ingestion or pose a physical hazard from sharp spines or thorns.

The use of herbicides involves potential risk or the perception of risk to workers and members of the public living or engaging in activities in or near herbicide treatment areas. In the PEIS, Human Health Risk Assessments (HHRAs) were utilized to evaluate potential risks to humans from exposure to the herbicide active ingredients. The main potential impact associated with the use of herbicides is exposure to the chemicals and other compounds added to the herbicide formula. These chemicals can all be toxic to human workers and exposed members of the public to varying degrees. Most clinical reports of herbicide effects are of skin and eye irritation.

The greatest risk for occupational exposure to herbicides is when the worker must directly handle and mix chemicals as they are handling the undiluted product. Exposure by handlers may also occur when the herbicide is mixed with water for application, through splashes, spills, leaking equipment, contact with spray or by entering treated areas. Occupational exposure can occur either through skin contact, eye exposure, or inhalation of the material. Adherence to operation safety guidelines such as the use of personal protective equipment (PPE) as required by the label, equipment checks to make sure the equipment is functioning properly, and correct application techniques such as not walking through freshly treated areas are all ways to limit these exposures. Accidental ingestion is a less common route of entry for herbicide exposure. Examples of this exposure include someone drinking from a food or drink container in which herbicides have been improperly stored or improper personal hygiene, such as not washing your hands before eating.

Public receptors can be exposed by being accidentally sprayed, by entering areas soon after treatment, eating berries or other foods, which have been sprayed, drinking contaminated water, or accidently coming into contact with herbicides that have drifted downwind. Members of the general public, both visitors and residents are less likely to be repeatedly exposed than vegetation management workers.

HHRA information in the PEIS shows that for herbicide AIs included in the proposed action, no health risk to occupational receptors was noted for seven of the AIs. Dicamba posed a low risk in the case of an accidental exposure to the formulation. Chlorsulfuron posed a low risk when applied at the maximum use rate in a broadcast ground spray scenario. 2,4-D has a low risk rating for most application scenarios. It has a moderate risk when applied at maximum rate in a boom spraying operation and accidental exposure when wearing contaminated gloves or spilled on the lower legs. 2,4-D labels note the product is corrosive and can cause irreversible eye damage. Herbicide safety classes often note this risk and CFO applicators are well aware of this hazard through risk assessments and continued training.

HHRA information in the PEIS shows that for herbicide AIs included in the proposed action, no health risk to public receptors were noted for eight of the AIs. Picloram posed a low risk for an acute/accidental exposure through consumption of contaminated water from a spill. 2,4-D posed a low to high risk from a variety of accidental exposure scenarios, including the consumption of contaminated fish. The major concern for members of the general public involves the consumption of contaminated vegetation (fruit) over a period of several months, a scenario that is not likely to occur as target weeds treated by the CFO generally occur in dry uplands not suitable for production of fruit. The exception to this may be treatment of blackberries in a riparian area. For most herbicides, risk to human receptors can be minimized or avoided by using the typical application rate and following SOPs that greatly reduce the likelihood of accidents.

During development of HHRAs and Ecological Risk Assessments (ERA) for the PEIS, the tendency of herbicide AIs to bioaccumulate was noted during review of the toxicological profiles. The PEIS analysis did not find evidence of high levels of bioaccumulation for any of the AIs in the proposed action. Herbicides often were excreted in urine and feces a short time after being introduced to the test animals.

A thorough discussion of human health and safety can be found in the PEIS pages 4-174 thru 4-196. Please refer to the document for additional information.

Biological control is unlikely to result in quantifiable risk to human health other than that posed by physical hazards encountered while releasing agents in remote and steep areas.

Manual treatment poses some risk to workers through a variety of mechanisms. Most common would be physical injury from attempting to pull, dig out, cut, or spin trim plants. Many target weeds have spines, thorns, or stiff hairs that can become embedded in hands when attempting to remove the plants. Some plants contain sap with toxic properties that can cause injury to the eyes or skin rashes. Most of these hazards can be minimized through attention to proper work practices for physical activity and the use of PPE such as gloves or eye protection. These impacts would be specific to the workers conducting weed control and not the general public.

Recreation users would be impacted by the presence of target weed species and treatments designed to remove them. The proposed action gives BLM the appropriate AIs and manual tools to treat target vegetation in recreation areas effectively. Treatments utilizing herbicides are implemented, to the extent possible, during times of low use. Treatment crews also discuss herbicide application with the public that may be utilizing the recreation area and in the case of campgrounds, avoid treating occupied sites. This often requires return trips to complete treatment objectives. Treatment sites frequented by recreation users may also be signed to inform the user public what herbicide was used and when it was applied. The proposed action would give BLM the flexibility to reduce potential impacts to recreation users from weed control actions.

Cumulative Effects

When addressing cumulative impacts to human health and safety, the impacts to individuals conducting vegetation treatments, as well as the effects of these treatments on the welfare of the public must be considered. Information on trends used in this analysis is summarized from the PEIS. Please see the PEIS pages 4-238 to 4-253 for additional information.

Risks to health and human safety resulting from the proposed action include risks from occupational injury and death and from exposure to industrial pollutants including herbicides. Occupational risks have generally declined nationally (reduction of 34% for nonfatal injury rate since 1992) although the agricultural and forestry sectors, where weed control would generally be classified, have higher fatality rates. Occupational risks faced by operators conducting herbicide control, biocontrol and manual control of weeds include such things as; hearing loss resulting from long-term exposure to loud application equipment, potential physical injury from falling while working in steep terrain, eye injury from accidental herbicide splashes, rashes from herbicide exposure, and physical injury including the eyes from flying debris during spin trimming or other manual control projects. BLM places high emphasis on workplace safety, including use of proper PPE and awareness of potential workplace hazards. Workers routinely conduct safety sessions before daily operations and BLM provides all PPE necessary to prevent occupational injury. In the past decade in the CFO only minor injuries have occurred during operations to control weeds. Most of these have been associated with cuts and scrapes or minor physical injury from falling during operations in rugged landscapes. No injuries have been known to occur in relation to acute exposure to herbicides. No perceptible change in risk to workers from implementation of the proposed action is expected to occur in the future.

Public receptors may be impacted mainly through accidental exposure to herbicides. There could be the remote potential that members of the public could be impacted by manual control operations such as spin trimming. The majority landowner in the CFO is the FS where herbicide use can be classified as minimal. Private lands in the CFO are either utilized for agricultural production or rangeland and forestry production. Herbicide and other pesticide use can be considered commonplace on private agricultural lands. Concerning proposed BLM use in the CFO, increased risk to the public from accidental exposure to herbicides enough to elicit a detectible change to human health is highly unlikely. Risk of physical injury from weed control actions is also highly unlikely as the public is rarely in proximity during manual operations which would pose a hazard.

For herbicides included in the proposed action, health assessments conducted as part of the PEIS did not show a modeled increased risk of cancer for occupational or public receptors.

Serious injury or death to humans caused by vegetation treatments could be irreversible and irretrievable. Risk of death or serious injury is very unlikely, based on incidence of injury (low) and death (none) associated with BLM vegetation treatments during the past decade.

4.9.2 Alternative 1 – 18 Active Ingredient List

Direct and Indirect Effects

Impacts to human health and safety from biological and manual control would be the same as for the Proposed Action alternative. The risks from herbicide application would be the same for this alternative as none of the additional eight AIs approved for use pose additional risks to occupational or public receptors and application methods are the same. Since aquatic herbicides are available for use in this alternative, there may be a slightly increased risk of exposure to the public through aquatic weed treatments.

Cumulative Effects

Cumulative effects would be the same as the proposed action.

4.9.3 Alternative 2 – No Aerial Application

Direct and Indirect Effects

Impacts from biological and manual control would be the same as in the Proposed Action, as would the risks from non-aerial application methods of herbicides. This alternative may have a slightly less risk of accidental exposure to public receptors from drift of herbicides applied aerially.

Cumulative Effects

Cumulative effects would be, for the most part, the same as the Proposed Action. It is not expected the slight decrease in public receptor exposure would change the cumulative effects analysis.

4.9.4 Alternative 3 – No Herbicide or Exotic Biological Control

Direct and Indirect Effects

This alternative would increase potential for physical injury to occupational receptors from manual and mechanical weed control. Mechanical control including the use of mowers would increase the potential for flying debris. The increased use of mechanized equipment including tractors would increase the potential for accidental injury due to rollovers and hazards of PTO (power take off) implements. Occupational receptors would have a higher risk of physical injury due to repetitive motions such as pulling weeds or using shovels. Risks to public receptors may also be slightly elevated due to the potential for flying debris. There would be no risk to either occupational or public receptors from herbicide exposure. There would be no difference in the human health hazard posed from biological control other than occupational hazards from releasing agents.

Cumulative Effects

Past and present cumulative effects would be the same as the Proposed Action. Although cumulative future risks to occupational and public receptors through herbicide use were minimal in the proposed action, the cumulative risks of herbicide use as a result of this alternative would be none. There may be a slightly elevated long-term risk to occupational and public receptors from injury due to manual and mechanical control but it would also be discountable in relation to cumulative effects.

4.9.5 Alternative 4 – No Action

Direct and Indirect Effects

The no action alternative includes five herbicide AIs that are different than the Proposed Action. None of these herbicides (bromacil, diuron, hexazinone, tebuthiuron or triclopyr) had more risk to human health than those herbicides found in the proposed action. Since all other aspects of this alternative are the same, direct and indirect effects are the same as in the Proposed Action.

Cumulative Effects

Cumulative effects are the same as the Proposed Action.

5 CONSULTATION/COORDINATION

5.1 Tribes, Individuals, Organizations or Agencies Consulted

Scoping for preparation of this EA included publishing information on the Idaho BLM NEPA website on November 17, 2008 (NEPA Database No. ID-420-2007-EA-3446). Scoping letters were sent on December 30, 2008, requesting comments from various groups and the public. The following summarizes responses the BLM received.

Wallowa Resources supports the Proposed Action, and does not support the no action or no aerial treatment alternatives due to ineffective control of invasive weeds. They support an IWM program with biological control and aerial application as a necessary tool in rugged topography. They support coordinated weed management with partners.

Idaho Conservation League supports a region-wide program for management of noxious weeds and recognizes the need to prevent or control their spread. Suggests BLM focus on prevention of weed spread during management activities and land uses (grazing, OHV, roads/travel management, timber management), suggests BLM monitor herbicide applications for drift, suggests BLM consider alternatives to herbicide treatments such as grazing, fire use, and mechanical treatment, and supports the judicious use of herbicides where safe and appropriate through ground based methods. Concerns include effects of herbicides in aquatic environments and impacts to amphibians, safety of aerial application in relation to potential drift and aquatic resources, and use of herbicides to control native plants (specific to undesirable plant control in commercial timber stands).

Friends of the Clearwater and Alliance for the Wild Rockies suggests BLM focus on prevention of weeds and suggests prevention practices, use of volunteers, mechanical treatments as well as experiments to increase the palatability of weeds to livestock and wildlife. Suggests BLM look at all components of an integrated program, analyze an adequate range of alternatives which include no herbicide or exotic biological control and monitor control efforts. Concerns include impacts of herbicides in relation to; aquatic resources such as salmon, steelhead, bull trout and amphibians, traditional tribal gathering areas, native plants, and humans. Concerns also include bio-accumulation and herbicide resistance.

Idaho County Weed Control supports the proposed action and BLM should include the use of all tools available; specifically prevention, inventory, herbicide application, and bio-control. Idaho County supports the use of aerial application as a tool and BLM's continued participation as a partner in cooperative weed management areas.

Adams County Weed Control supports BLM's participation in cooperative efforts and inventory and control of weeds in Adams County.

BLM participates in meetings of the Clearwater Basin WMA, Joseph Plains WMA, Tri-State WMA, Salmon River WMA and Upper Clearwater WMA as they occur to coordinate management actions across ownerships. The WMAs all encourage IWM activities such as those being proposed by BLM in this EA.

Consultation under section 7 of the Endangered Species Act is ongoing for ESA-listed plants, animals and fish. BLM coordinated with NMFS and USFWS biologists in preparing a biological assessment specific to the proposed action (BLM 2011). The BA was submitted with a request for formal consultation on December 1, 20011, and is expected to conclude with a biological opinion from U.S. Fish and Wildlife Service and NMFS.

The Nez Perce Tribe was contacted with the initial scoping letter. No response was received. The project was discussed at a staff Tribal coordination meeting on April 29, 2009.

Due to extended timeframe for completion of the BA and this analysis, public notice of this Cottonwood Integrated Weed Treatment Program EA was again posted in the BLM NEPA Register on September 27, 2011 (as NEPA No. DOI-BLM-ID-C020-C020-2011-0017-EA).

5.2 List of Preparers

- LeAnn Abell – Botany, ESA listed and Sensitive Plants
- Robbin Boyce – Forestry, Project Management
- Becky Chaffee – Weeds, Vegetation Management
- Lynn Danly – Project Lead - Weeds, Soils, Vegetation, Human Health, Special Management Areas, ESA listed and sensitive plants
- Eric Geisler – Forestry
- Craig Johnson – ESA listed and Sensitive Fish, Fisheries, Water Quality, Wildlife
- Mark Lowry – ESA listed and Sensitive Plants, Riparian
- Joe O'Neill – Recreation, Wild & Scenic Rivers, Special Management Areas
- Scott Pavey – Land Use Planning and NEPA
- David Sisson – Archeology, Native American Tribal Uses
- Stephanie Snook – Public Involvement and NEPA
- Jerad Spogen – Forestry
- Mike Stevenson – Water Quality, Soils
- Lorrie West – Land Use Planning and NEPA

5.3 Distribution

This EA will be available for public comment on the Idaho BLM public internet site at http://www.blm.gov/id/st/en/info/nepa.html. Copies may be requested by calling or visiting the BLM Cottonwood Field Office, 1 Butte Drive, Cottonwood ID 83522, telephone 208-962-3245. A notice of availability will be sent to the following interested entities who commented during scoping.

Non-Governmental Organizations
Jonathan Oppenheimer, Idaho Conservation League, Boise ID
Gary Macfarlane, Friends of the Clearwater and Alliance for the Wild Rockies, Moscow ID
Wallowa Resources, Enterprise OR

Tribes
Nez Perce Tribe, Lapwai ID

State and Local Governmental Agencies
Idaho County Weed Control
Adams County Weed Control

Federal Agencies
NOAA Fisheries, Boise ID
NOAA Fisheries, Grangeville ID
U.S. Fish and Wildlife Service, Boise ID

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Appendix 1 – Cottonwood Weed Control Sites

Site	Acres*	T.	R.	Section(s)	Site Description
Russell Bar Seed Orchard	20	27N	1E	14, 23, 24	Seed orchard/administration site, ground based application along with some treatment along the Salmon River.
Hammer Creek	10	28N	1E	10, 15	Recreation/administration site, ground based application. Treatment will occur along the Salmon River
Clearwater	50	34N	2E	1	Recreation sites include Pink House, Pardee, Harper's Bend and McKay's Bend. Ground based application includes road access and potential for treatment along the Clearwater River.
		34N	3E	5, 6, 7, 17, 18, 20, 21, 26, 27, 28	
		35N	2E	2, 3, 10	
		35N	3E	31	
		36N	1E	1, 6	
		36N	1W	1, 2, 3, 4, 9	
		36N	2E	34, 35	
		36N	3W	4, 5, 6, 7, 18	
		36N	4W	21, 22	
		37N	1E	32, 34	
		37N	1W	31	
		37N	2W	28, 29, 30	
		37N	3W	25, 32, 33, 34	
Pine Bar	40	29N	1E	4, 5	Road right-of-way, campground, riparian and upland sites. Ground based application along roadways and in campground and along river, aerial possible on uplands.
		30N	1E	31, 32, 33, 34	
McCulley Creek	70	29N	1E	3, 10, 11, 13, 14, 15, 22, 23, 26, 27, 34	Mostly uplands with potential for aerial application. Ground based treatment along the Salmon River and tributaries.

Site	Acres*	T.	R.	Section(s)	Site Description
Butcher Bar	60	26N	1E	26, 27, 28, 34, 35	Mostly uplands with potential for aerial application. Treatment in riparian areas along the Salmon River and tributaries.
Lyons Bar	40	28N	1E	3, 10, 11, 15	Road right-of-way, ground based application. Some treatment along river corridor.
		29N	1E	34, 35	
Bracket Gulch	20	28N	1E	27	Upland site, ground based and aerial application.
Wickiup Creek	150	30N	1W	3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 21, 22, 27, 28, 29, 34	Upland site, ground based and helicopter application. Riparian treatments along river and tributaries.
		31N	1W	22, 27, 31, 32, 34	
American Bar	40	30N	1W	23, 24, 25, 26	Mostly upland site some riparian treatment along Salmon River and tributaries. Primarily ground based application.
John Day Bar	50	26N	1E	11, 12, 13, 14, 22, 23	Mostly upland site with both aerial and ground based application. Treatment along Salmon River and tributaries.
Soard Flat	25	24N	1E	4, 8, 9, 15, 18, 19, 20, 22, 28, 29,30	Upland site, both ground based and helicopter application.
Elk City Township	50	29N	8E	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35	Includes Buffalo Gulch mine area, road rights-of-way, Forgotten 400 and parcels along Highway 14. Ground based application. Riparian treatments along tributary streams.
Dempsey Flat	40	23N	1E	14, 15, 22, 23, 26, 27, 29, 33, 34, 35	Mostly upland site. Ground based application along road and some riparian habitat.

Site	Acres*	T.	R.	Section(s)	Site Description
Partridge Cr./ Elkhorn Road	40	24N	3E	19, 20, 21, 28, 29, 30, 33	Ground based application along roads and riparian areas.
North Bench	150	31N	4W	18	Treatment of formerly farmed and seeded fields and road access by ground and aerial methods.
		31N	5W	1, 2, 11, 12, 13, 14, 23	
Corral Creek Road	80	31N	5W	13, 24, 25, 26	Treatment of road right-of-way and feedlot areas by ground methods. Aerial methods may be used on non- sensitive upland areas. Application in RCA of various streams.
		31N	4W	5, 6, 7, 8, 18	
		32N	4W	29, 30, 31, 32	
Rydempski Road and Flats	50	31N	4W	7, 17, 18, 19	Treat road right-of-way, former feedlot areas, fields, RCAs and upland areas by ground methods.
		31N	5W	24	
Eagle Creek	30	32N	4W	26, 34, 35	Treat heavily traveled road right-of-way and upland areas by ground and aerial methods. Limited application in HCA.
		31N	4W	1, 2, 11, 12, 13	
		31N	3W	6, 7, 18, 19, 20, 27, 28, 29, 30, 31, 32, 33, 34	
		30N	3W	5, 6, 7, 18	
Captain John	50	32N	4W	3, 4, 5, 6, 7, 8, 9, 17, 18, 19, 20	Helicopter and ground based application of upland site. Limited application in RCA.
		33N	4W	20, 29, 33, 34	
		33N	5W	15	
Billy Creek	50	32N	5W	11, 13, 14, 15, 22, 23, 24, 25, 26	Upland site application with helicopter and ground based methods. Some treatment in RCAs.
Deer Creek	100	31N	3W	3, 4, 8, 9, 10, 12, 13, 14, 15, 23, 24, 25, 26	Helicopter and ground based application of upland site. Some ground based application in RCA.
		32N	3W	33, 34	

Site	Acres*	T.	R.	Section(s)	Site Description
Cave Gulch	105	31N	4W	17, 19, 20, 21, 27, 28, 29, 30, 31, 32, 34, 35	Upland application of formerly farmed and seeded areas and road access by utilizing helicopter and ground based methods.
		31N	5W	25, 36	
		30N	4W	5	
Cottonwood	40	30N	3W	19, 29, 30, 31, 32	Upland application utilizing helicopter and ground based methods.
		29N	4W	2, 3, 11, 12	
		30N	4W	1, 2, 3, 7, 8, 9, 12, 14, 15, 17, 20, 21, 22, 25, 26, 27, 28, 29, 33, 34, 35	
		29N	3W	5, 6, 7	
Blackhawk Bar	100	26N	1E	2, 3	Upland sites, ground based and aerial application. Ground based treatment in RCAs.
		27N	1E	23, 26, 34, 35	
Rattlesnake Ridge	200	29N	2W	2, 3, 4, 12, 17, 19, 20, 21, 28, 33	Upland sites with both ground based and aerial application. Some treatment in RCAs of Salmon River and tributaries.
		28N	2W	1, 4, 11, 13	
		29N	1W	7, 8, 18, 30, 31	
		29N	3W	3, 5, 6, 7, 8, 9, 17, 18, 19, 20, 23, 30, 35	
		29N	4W	12, 13, 24, 25	
		30N	2W	1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 14, 15, 18, 19, 20, 29, 33	
		30N	3W	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 20, 21, 30, 32	
		31N	2W	7, 8, 17, 19, 20, 21, 27, 28, 32, 33, 34, 35	
		31N	3W	12, 13, 24, 25, 26, 27, 33, 34	

Site	Acres*	T.	R.	Section(s)	Site Description
Lucile and Lucile Caves	50	25N	1E	1, 2, 11, 12, 14	Recreation sites and adjacent uplands, RCA treatment along Salmon River, ground based application.
Slate Creek	10	27N	1E	26	Campground and adjacent uplands, ground based application and treatment of RCA along Salmon River.
Trail Creek	40	21N	1E	2, 3, 10, 11, 14, 15, 22, 23, 24, 35	Logging roads, upland sites and treatment in RCAs, ground based application.
Salmon River: Riggins and East	100	24N	1E	2, 11, 13, 14, 22, 23, 28	Ground based application on BLM lands along the river corridor, aerial and ground based application on upland sites.
		24N	2E	13, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35	
		24N	3E	13, 14, 15, 18, 22, 23, 24, 25, 26, 27, 31, 32, 34, 35	
		24N	5E	7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34	
Tommy Place	50	28N	1E	3, 9, 10	Upland sites and RCA treatment along Salmon River, ground based application.
Cottonwood field office as detected	5			N/A	During inventory, if any invasive weed species are identified, clearances for cultural resources and T&E plants will be obtained and the weeds will be treated.
Skookumchuck	5	27N	1E	2, 3	Recreation site

Site	Acres*	T.	R.	Section(s)	Site Description
Lolo Creek	20	34N	3E	1	Upland sites, ground based application. Limited application in HCA.
		34N	4E	6, 7, 8, 13, 15, 17	
		34N	5E	17, 18, 20, 21, 22, 23, 24	
		35N	2E	13, 23, 24, 25, 26	
		35N	3E	18, 19, 20, 21, 22, 23, 26, 27, 28, 30, 35	
Whiskey Butte	20	25N	1E	22, 26, 27, 28, 34, 35	Upland sites, ground based and aerial based application. Ground based application in RCA.
Fiddle Creek	20	25N	1E	23, 24	Upland sites, ground based and aerial based application. Ground based application within RCA.
Indian Mountain	100	23N	1E	1, 3, 10, 11, 12	Upland sites, ground based and aerial based application. Ground based application within RCA.
Harpster Grade	40	30N	4E	4, 7, 8	Upland sites, ground and aerial application.
Long Gulch	40	26N	1E	1	T&E Plant Site
Hard Creek	10	21N	1E	1, 2, 11, 12, 13, 14, 24, 25	Treatment in both upland and RCA, ground based application.
Elk Creek	40	22N	1E	1, 2, 3, 9, 13, 14, 21, 22, 23, 24, 25, 27, 28, 33, 34, 35	Upland sites, ground based and aerial based application. Ground based application within RCA.
John Day	40	26N	1E	25	Upland sites, ground based and aerial based application. Limited application within HCA.
		26N	2E	17, 18, 19, 21, 28, 29, 30, 31, 32, 33	
Bear Gulch	5	27N	2E	32, 33	Upland sites, ground based application.
		26N	2E	4, 5, 7, 8, 9	

Site	Acres*	T.	R.	Section(s)	Site Description
Sotin Creek	50	28N	1E	26, 34	Upland sites, ground based and aerial based application
Deep Creek	40	30N	4W	1,2	Upland sites with ground and aerial application some treatment in RCAs.
		31N	2W	6, 7, 17, 19, 20, 21, 22, 23, 27, 28, 34	
Rhett Creek	150	27 N	1 E	9, 15, 17, 21, 22	Upland sites with ground based and aerial based application. Treatment in RCAs.
Camp Howard	20	27N	1E	6, 7	Upland sites with ground and aerial application. Treatment in RCAs
		28N	1E	18, 19, 29, 30, 31	
		28N	1W	7, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 35	

*Acres are estimated and represent the highest amount of treatment that would occur in the project area in any one year.

Appendix 2 - Idaho BLM Sensitive Species in the Cottonwood Field Office

Table 1 – Sensitive Plant Species

Name	Habitat
Type 2 - Rangewide/Globally Imperiled Species – High Endangerment: Includes species that are experiencing declines throughout their range with a high likelihood of being listed under the Endangered Species Act in the foreseeable future due to their rarity and significant endangerment factors.	
Asotin milkvetch *Astragalus asotinenesis*	Canyon grasslands
Broad-fruit mariposa lily *Calochortus nitidus*	Palouse Prairie and canyon grasslands. It also occurs within natural forest openings and open ponderosa pine and/or Douglas-fir communities in forested uplands.
Douglas' clover *Trifolium douglasii*	Found in meadows, riparian areas, and along streambanks.
Green-band mariposa lily *Calochortus macrocarpus var. maculosus*	Endemic to the canyons of the Lower Salmon, Lower Clearwater, and middle Snake Rivers. Most commonly associated with bluebunch wheatgrass communities Occurs primarily on dry, warm, south-facing slopes.
Idaho hawksbeard *Crepis bakeri ssp. Idahoensis*	Snake River canyonlands on dry to seasonally mesic open grassland slopes, benches, and ridges. Primarily in bluebunch wheatgrass-Sandberg's bluegrass and Idaho fescue/bluebunch wheatgrass communities.
Jessica's aster *Symphyotrichum jessicae*	Palouse Prairie and canyon grasslands, near small drainages, but on dry ground. Generally found within ponderosa pine/snowberry, Idaho fescue/snowberry, and Douglas-fir/ninebark habitat types.
Palouse goldenweed *Pyrrocoma liatriformis*	Palouse Prairie and canyon grasslands, generally within the Idaho fescue and bluebunch wheatgrass habitat types. Occurs from 1,900 to 3,000 feet.
Plumed clover *Trifolium plumosum ssp. ampifolium*	Dry to moderately moist Palouse Prairie, canyon grasslands, and meadows, within the Idaho fescues and bluebunch wheatgrass habitats in ponderosa pine stands.
Spacious monkey-flower *Mimulus ampliatus*	Seepy basal outcrops and vernal seeps in open grassland or forest opening. Prefers particularly moist and shady sites. Known locations range from 2,600 to 6,900 feet in elevation.
Thin–sepal monkey-flower *Mimulus hymenophyllus*	Found in wet, mesic forests.
Type 3 - Rangewide / Globally Imperiled Species - Moderate Endangerment: Includes species that are globally rare with moderate endangerment factors. Their global rarity and inherent risks associated with rarity make them imperiled species. Cottonwood Field Office currently has eight Type 3 plants.	
Candystick *Allotropa virgata*	Limited to forest habitats in which lodgepole pine are dominant or in a few cases at least a significant component.
Case's corydalis *Corydalis caseana ssp. hastate*	Primarily found along streams within the riparian area. Commonly found in cedar, Engelmann spruce and grand fir habitat types.
Chatterbox orchid *Epipactis gigantea*	Occurs within moist riparian habitats associated with springs, seeps, stream banks, and thermal sites.
Deer-fern *Blechnum spicant*	Occus at less than 4,200 feet within dense, moist, generally mature wester red cedar with western hemlock forests. Usually on northern aspects and moderate slopes (10 to 60 percent).
Goldenback fern *Pentagramma triangularis ssp. Triangularis*	Rock crevices and open rocky slopes in valleys and foothills. Found often in partly shaded sites. From 1,500 to 2,700 feet.
Hall's orthotrichum *Orthotrichum hallii (moss)* Type 3	Found on dry rocks that are shaded.
Hazel's prickly phlox *Leptodactylon pungens ssp. hazeliae*	Found in shallow rocky soils, cliffs, scree areas and rock outcrops in canyon grasslands associated with bluebunch wheatgrass habitat types; usually found below 2,000 feet.
Idaho barren strawberry *Waldsteinia idahoensis*	Meadows and moist woods along streams. Toe to mid-slopes, occurs in moist and cool sites associated with grand-fir, cedar, and alpine fir zones.
Lemhi milkvetch *Astragalus aquilonius*	Canyon grasslands,dry, gentle to often steep and unstable slopes, talus, washes, alluvial debris, and flats. It occurs on various, but often southerly aspects having gravelly and sandy, to ashy and occasionally clayey soils.
Payson's milkvetch *Astragalus paysonii*	Early- to mid-successional sites dominated by lodgepole pine with scattered Douglas-fir and western larch present. Found on north, northeast, and east aspects on flat to moderate slope (up to 45 percent). Elevation generally between 4,600 and 5,800 feet.

Name	Habitat
Salmon River biscuitroot *Lomatium salmoniflorum*	Found in shallow rocky soils, cliffs, scree areas and rock outcrops in canyon grasslands associated with bluebunch wheatgrass habitat types; usually found below 2,000 feet.
Stalk-leaved monkey- flower *Mimulus patulus*	Found on ephemeral seeps, moist basalt, and very fine gravel on top of bedrock. May be found in relatively undisturbed, winter-wet, summer dry, canyon grasslands.
Tolmie's onion *Allium tolmiei var. persimile*	Grassland communities on rocky, gravelly, or clayey site. Seasonally wet soils of elevation generally between 2,500 to 5,000 feet elevation.
Tweedy's reedgrass *Calamagrostis tweedyi*	Moist meadows and subalpine slopes, usually in timber.
Western ladies-tresses *Spiranthes porrifolia*	Typically occurring in seeps in Douglas-fir stands at lower timberline near transition to grasslands.
Type 4 - Species of Concern: Includes species that are generally rare in Idaho with currently low endangerment threats.	
Marsh Willowherb *Epilobium palustre*	Commonly occurs in marshes and wet ground, including flushes on hills.
Palouse thistle *Cirsium brevifolium*	Palouse prairie habitats, typical elevations 1,800 to 4,900 feet.
Snowball cactus *Pediocactus nigrispinus*	Often with sagebrush and canyon grasslands. Desert valleys to low mountains.

Table 2 – Sensitive Animal Species

Name	Habitat
Mammals	
Gray Wolf *Canis lupus*	Key components of wolf habitats are sufficient year-round prey base of ungulates and alternative prey, suitable and semi-secluded denning and rendezvous sites, and sufficient seasonal habitats with minimal exposure to humans. The gray wolf was delisted as an ESA-listed species in 2011.
Fisher *Martes pennant*	Dense canopied, late seral timber types at higher elevations. Dead and down timber in grand fir, Douglas-fir, or other conifer types are most preferred.
California Myotis *Myotis californicus*	Found in lower elevation areas up to approximately 5,500 feet. Uses a variety of habitats, such as canyons, riparian areas, and grasslands. Within Idaho, primarily found in Adams county.
Fringed Myotis *Myotis thysanodes*	Large trees, caves, mine tunnels, attics of old buildings. Insectivorous.
Townsend's Big Eared Bat *Plecotus townsendii*	Caves, mine tunnels and buildings for roosts, obligate cave/mine user, may also feed on ground or in shrubs. Insectivorous.
Coast Mole *Scapanus orarius*	Found in agricultural lands, grassy meadows, coniferous and deciduous forests and woodlands, and along streams. In Idaho, primarily found in Adams county.
Birds	
Peregrine Falcon *Falco peregrinus anatum*	Primarily open country; specifically cliff localities adjacent to mountain valleys, rivers, and large bodies of water. Nest is cape on ledge of high cliff. Foods are primarily small birds.
Bald eagle *Haliaeetus leucocephalus*	Winter habitat for the bald eagle is primarily associated with the larger rivers and corridors, such as the Snake, Salmon, Clearwater River, South Fork Clearwater Rivers; and Dworshak Reservoir. Bald eagles will also utilize lower elevation uplands and prairie areas during winter periods, particularly if carrion is available. Winter habitat for bald eagles is a function of perch and roost site availability, as well as access to fish, waterfowl, and ungulate carrion as forage/prey. Nest sites have been documented in the Dworshak Reservoir area, along Clearwater River, and along Salmon River. The bald eagle was delisted as an ESA-listed species in 2007.
Northern Goshawk *Accipiter gentilis*	Forests, forest edge, open woodlands. Most common in ponderosa pine, lodgepole pine and Douglas-fir forests. Riparian habitats in winter. Nests are masses of twigs in tall conifers. Foods are tree squirrels, jackrabbits, ground squirrels, small birds, and occasionally grouse.
Prairie Falcon *Falco mexicanus*	Steppe, canyon grasslands, to forests with cliffs. Nest is sticks and twigs on niche of cliff. Foods are ground squirrels, rodents, small birds.

Name	Habitat
Flammulated Owl *Otus flammeolus*	Montane forests, open stands of fire-climax ponderosa pine or Douglas-fir forests. Nests in abandoned woodpecker holes. Primarily insectivorous.
American White Pelican *Pelecanus erythrorhynchos*	Found on rivers and lakes. Feeds mainly on fishes, eats some salamanders and crayfishes. Has been observed (very rare) on larger rivers (e.g. Snake River) and Mann Lake within the Cottonwood Field Office management area. In Idaho, breeds at Minidoka National Wildlife Refuge, Blackfoot Reservoir, and on Snake River near Glenn's Ferry.
Harlequin Duck *Histrionicus histrionicus*	In Idaho, breeds on forested mountain streams of relatively low gradient free of human disturbance. Feeds primarily on crustaceans, mollusks, insects, and a few small fishes. Has been found in Lochsa River and Lolo Creek drainages.
Lewis Woodpecker *Melanerpes lewis*	Open or logged forests, river groves in mountains. Nest is a hole in tree. Foods are insects, berries, and fruits.
White-headed Woodpecker *Picoides albolarvatus*	Montane coniferous forests, primarily dry open forests with ponderosa pine and Douglas-fir. Nest is a hole in tree or stump, often close to ground. Food is primarily insects.
Williamson's Sapsucker *Sphyrapicus thryoideus*	Coniferous forests and burns at higher elevations in mountains. Nest is hole in tree. Foods are sap, insects and inner bark.
Mountain Quail *Oreotys pictus*	Riparian areas, shrub mountainsides, coniferous forests, and forest edge. Nests on ground. Foods are buds, seeds, grain, and insects.
Olive-sided Flycatcher *Contopus borealis*	Open timber at meadow margins in sparse timber, burns, partially logged areas. Nest is woven twigs near end of a horizontal limb of a conifer. Food is insects caught while flying.
Hammond's Flycatcher *Empidonax hammondii*	Mountains, in partially logged forests, open woods and along forest edges at medium and lower elevations. Nest is woven cup of vegetation in deciduous tree. Insectivorous and eats insects, such as beetles, moths, flies, bees, and wasps.
Willow Flycatcher *Empidonax traillii*	Riparian areas, swamps, willow thickets, open woodlands. Builds cup shape nest in shrub or deciduous tree. Insectivorous.
Calliope Hummingbird *Stellula calliope*	Foothills and forested mountains. Nests in conifers. Foods are nectar and insects.
Brewer's Sparrow *Spizella breweri*	Lowest elevations to highest (8,000 feet or more) in sagebrush valleys, dry grassy ridges of foothills, brushy plains to tree line, cultivated areas with brushy fence rows or patches. Nest is cup of grass and twigs usually in sagebrush. Foods are insects and seeds.
Reptiles	
Common Garter Snake *Thamnophis sirtalis*	Inhabits wet or moist habitats. Preys primarily on earthworms, frogs, toads, salamanders, and fish.
Amphibians	
Coeur d'Alene Salamander *Plethodon idahoensis*	Found in three primary habitats, which include springs or seepages; spray zones of waterfalls; and edges of streams. Often associated with fractured rock. Found in forested areas of northern Idaho. Areas within north central Idaho include the North Fork Clearwater River, Lochsa River, and Selway River drainages.
Idaho Giant Salamander *Dicamptodon aterrimus*	Larvae usually inhabit clear, cold streams, but are also found in mountain lakes and ponds. Adults are found under rocks and logs in humid forests, near mountain streams, or on rocky shores of mountain lakes. Larvae feed on wide variety of aquatic invertebrates as well as some small vertebrates (e.g., fish, tadpoles, or other larval salamanders). Adults eat terrestrial invertebrates, small snakes, shrews, and salamanders.
Western Toad *Bufo boreas*	Streams, springs, grasslands, woodlands, mountain meadows. Usually in and/or near ponds, lakes, reservoirs, rivers, streams. Insectivorous.
Woodhouse Toad *Bufo woodhousii*	Found in grasslands, shrub steppe, woods, river valleys, floodplains, and agricultural lands, usually in areas with deep, friable soils. Metamorphosed toads eat various small, terrestrial invertebrates. Larvae eat suspended matter, organic debris, algae, and plant tissue. Within north central Idaho, primarily found in suitable habitats in Clearwater River subbasin (e.g., Nez Perce, Lewis, and northwest portion of Idaho counties).
Invertebrates	
Columbia River Tiger Beetle *Cicindela columbica*	Sandy beaches/riparian areas along the Salmon River.

Name	Habitat
Marbled disc *Discus marmorensis*	Generally found at moderate elevations on limestone terrain in relatively intact, moist, well-shaded (closed to nearly closed canopy) ponderosa pine forest, with diverse deciduous and forb understory. Occasionally occurs in moist schist taluses occurring in forested areas. Colonies are generally near stream edges and at the base of steep slopes, moist sites near permanent water preferred. Found in central portion of a few large Salmon River tributaries in the vicinity of Lucile (e.g., John Day Creek, Slate Creek).
Shortface Lanx *Fisherola nuttalli*	Found in unpolluted swift-flowing, highly oxygenated cold water on stable boulder-gravel substrate, in small to large rivers, often in the vicinity of rapids. Locally found in the Snake River (Hells Canyon) and the lower portion of the Salmon River.
Columbia Pebblesnail *Fluminicola columbianus*	Occurs in the mainstem Salmon River. Restricted to small-large rivers, in swift current on stable gravel to boulder substrate in cold, unpolluted, highly oxygenated water, generally in areas with few aquatic macrophytes or edyphytic algae.
Idaho Banded Mountainsnail *Oreohelix idahoensis idahoensis*	Occurs in low-middle elevation limestone and calcareous schist outcrops and talus. Typically in rather dry and open terrain associated with canyon grasslands and shrubs. Original distribution was a small area on both sides of the Salmon River from the mouth of China Creek (near Lucile) to Race Creek. Occurs within the Lucile Caves RNA/ACEC.
Whorled Mountainsnail *Oreohelix vortex*	The species occurs in low to mid elevations in the Salmon River drainage, from Rock Creek to Riggins. Restricted to large-scale taluses. Sites are typically rather dry and open. Grasses common at preferred sites, with some forbs and shrubs.
Boulder Pile Mountainsnail *Oreohelix jugalis*	Found in lower elevation areas in the Salmon River canyon, from river mile 20 to Riggins. Occurs in rock taluses and boulder piles. Sites generally open and can be seasonally dry. Plant associates include hackberry, shrubs, and grasses.
Striate Mountainsnail *Oreohelix strigosa goniogyra*	This snail is found mostly on forested outcrops (ponderosa pine), with lithologies ranging from greenish schist to limestone. Occurs in the Lower Salmon River area, in the vicinity of Riggins. May be limited to a few colonies in Race Creek drainage and Lake Creek.
Lava Rock Mountainsnail *Oreohelix waltoni*	Found in dry open areas occurring in the Lower Salmon River. Occurs between White Bird and Riggins, primarily in the Lucile and John Day Creek areas. Associated with basalts and mixed schist/alluvium sites. Common plants found at sites are grasses and shrubs.