FOREST SERVICE
Northern Region
Idaho Panhandle National Forests

USDA

Priest Lake Noxious Weed Control Project

Draft Environmental Impact Statement

Priest Lake Ranger District

NOXIOUS WEED CONTROL PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Priest Lake Ranger District, Idaho Panhandle National Forests
Bonner County, Idaho and Pend Oreille County, Washington

August, 1996

Lead Agency:	USDA Forest Service
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ABSTRACT

Three alternative courses of action have been developed for management of specific noxious weed species on National Forest lands within the Priest Lake Ranger District. Alternative A would take no action to control or reduce invasion by noxious weeds. Alternative B would combine manual, cultural and biological control methods. Alternative C would apply herbicides in addition to the manual, cultural and biological methods of Alternative B.

The proposed weed management program has six objectives, as follows:

- **Protect the natural condition and biodiversity of the Priest River Ecosystem by preventing or limiting the spread of aggressive, non-native plant species that displace native vegetation.**
- **Prevent or limit the spread of noxious weeds into areas that presently contain few to no noxious weeds.**
- **Reduce weed seed sources at recreation sites such as trail heads and dispersed campsites, along main travel routes including roads and trails, within powerline corridors, and in meadows within grazing allotments.**
- **Reduce the social and economic impacts of spreading populations of noxious weeds.**
- **Protect sensitive and unique habitats from invasions by non-desirable weed species.**
- **Comply with Federal and State laws regulating management of noxious weeds.**

The Priest Lake Ranger District is seeking comments on the noxious weed control proposal and alternatives. **Comments must be received at the office listed above no later than 45 days following Notice of Availability of this Draft EIS in the Federal Register.** It is anticipated such Notice will be published on August 5, 1996. **Accordingly, the final date for accepting comments would be September 30, 1996.**

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decisionmaking process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewer's position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, 1986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Noxious Weed Control Project
Environmental Impact Statement

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Chapter I
Purpose of and Need for Action

Introduction

This chapter describes the locations of noxious weeds on the Priest Lake Ranger District and the need to control the spread of certain undesirable weeds. It outlines the actions being proposed to address the noxious weed infestation within the Priest River Ecosystem.

Proposed Action

The Priest Lake Ranger District proposes to control noxious weeds on 128 specific sites on National Forest lands on various locations throughout the district. (Site #87 has been dropped from consideration.) Most treatment sites are located near or along forest roads, trails, powerline corridors, recreation sites, and meadows within grazing allotments. An integrated pest management approach, including chemical, biological, cultural and mechanical controls, would be used.

The Proposed Action is represented as Alternative C in this EIS.

Over the past several years the Priest Lake Ranger District has conducted extensive inventories of noxious weeds on public lands. The area proposed for treatment totals less than one percent (1.0%) of the 322,527 acres in the Priest Lake Ranger District. Currently 128 sites with noxious weeds have been identified. Sites range in size from single plants to infestations covering about 25 acres.

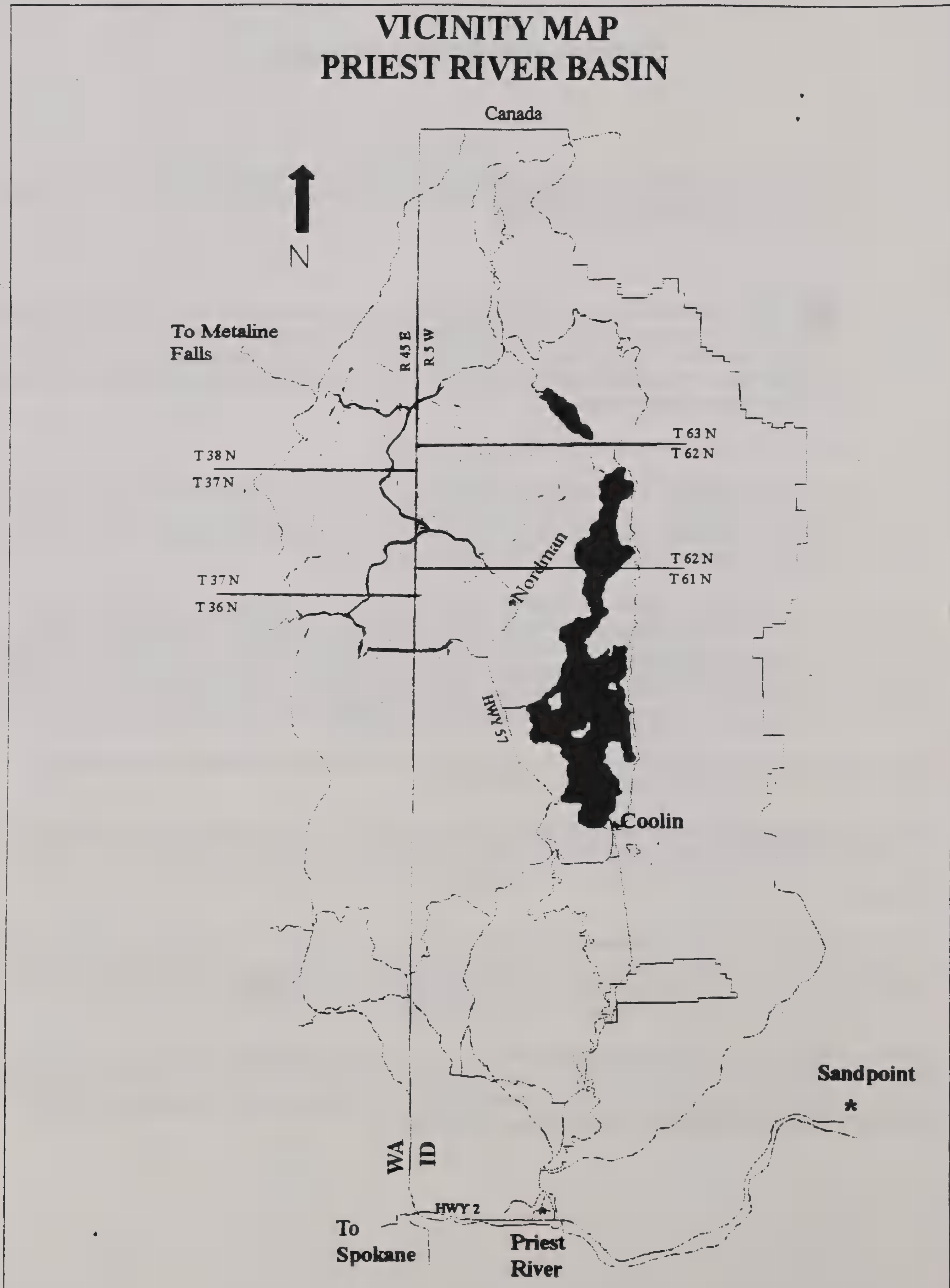
More than 13 new or potential species of weed are considered from control measures. The major species include meadow hawkweed (*Hieracium pratense*), spotted knapweed (*Centaurea biebersteinii*), orange hawkweed (*Hieracium aurantiacum*), Dalmation toadflax, (*Linaria dalmatica*), Canada thistle (*Cirsium arvense*), goat weed (*Hypericum perforatum L.*), houndstongue (*cynoglossum officinale*) and common tansy (*Tanacetum vulgare*). Other species may include diffuse knapweed (*Centaurea diffusa*), purple loosestrife (*Lythrum salicaria*), yellow starthistle (*Centaurea solstitialis*), musk thistle (*Carduus nutans*), and bull thistle (*Cirsium vulgare*).

New invader species identified by state or county weed control boards will be treated as appropriate and feasible based on resource priorities and levels of funding.

This Environmental Impact Statement (EIS) examines alternatives for treating these sites. These alternatives include a variety of methods including manual, cultural, and biological techniques. One alternative combines these non-chemical methods with herbicide applications. The effects of a No Action Alternative are also analyzed.

Potential treatment methods considered under the alternatives are described in the section on Methods and Practices Available on pages II-3 through II-7. Preferred treatments vary by site and weed species. They can include either chemical, biological, or manual treatment or combinations of these treatments. Alternative C is the preferred course of action. Details of this alternative are found on pages II-17 through II-26.

This analysis also assumes that new sites will be discovered in key ecosystems and that these sites are in land types analyzed in this document. For analysis purposes, these new infestations are assumed to increase the total infestation acreage by 20 percent. Treatments would be manual, cultural, biological, or chemical, depending upon which alternative is selected for implementation.


VICINITY MAP
PRIEST RIVER BASIN
Canada
N
To Metaline Falls
R 45 E
R 5 W
T 63 N
T 62 N
T 38 N
T 37 N
T 62 N
T 61 N
T 37 N
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Nordman
HWY 57
Coolin
Sandpoint
WA
ID
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Purpose and Need for Action

The objectives of the weed control project are:

○ Protect the natural condition and biodiversity of the Priest River Ecosystem by preventing or limiting the spread of aggressive, non-native plant species that displace native vegetation.

○ Prevent or limit the spread of noxious weeds into areas presently containing little or no noxious weeds.

○ Reduce weed seed sources at recreation sites such as trail heads and dispersed campsites, along main travel routes including roads and trails, within powerline corridors, and in meadows within grazing allotments.

○ Reduce the social and economic impacts of spreading populations of noxious weeds.

○ Protect sensitive and unique habitats.

○ Comply with Federal and State Laws regulating management of noxious weeds.

Noxious weeds are spreading on public lands at an alarming rate. On National Forest lands, noxious weeds can compete with native vegetation, eventually impacting wildlife and plant habitat, recreational opportunities, grazing allotments, and forest beauty. Their impacts are both tangible and intangible. Some are perceived, some pose a genuine threat to individuals or their livelihood.

Noxious weeds have established themselves throughout the Northwest and on the Priest Lake Ranger District. Because of their prolific seed production, noxious weeds can spread rapidly to areas where their presence is not desired.

State laws and county ordinances require that all landowners are responsible for the control of noxious weeds on their lands. The states of Idaho and Washington, Bonner and Boundary Counties in Idaho, and Pend Oreille County in Washington have been active in noxious weed control and eradication for several years. These counties have noxious weed control boards.

Control is costly and may require a large investment of time to stay ahead of the encroaching weeds. Noxious weeds have economic and health impacts which are discussed in greater detail in Chapters III and IV.

The spread of noxious weeds can primarily be attributed to human-caused dispersal such as vehicles and roads, contaminated livestock feed, contaminated seed, and ineffective revegetation practices on disturbed lands. As the complexity of the weed issue has expanded and intensified, many individuals and government agencies realize there is a need to better respond to the noxious weed issue. There is greater recognition of the noxious weed problem and more realization that the weeds do need to be dealt with in the most effective manner.

Vallentine (1988) explains that some of the worst noxious plant problems currently and futuristically are caused by weed species such as leafy spurge, Canada thistle, the knapweeds, and Dalmation toadflax. All of these species are found on the Priest Lake Ranger District and have been expanding rapidly over the last several years.

The Forest Service finalized a Noxious Weed Policy on December 1, 1995, in response to direction from the Secretary of Agriculture. The Priest Lake Noxious Weed Control project is being proposed to address the urgent nature of noxious weed spread and infestation within the Priest River Ecosystem.

The potential impacts of this proposed project are analyzed in this Environmental Impact Statement (EIS). This EIS relies on findings previously documented in the Idaho Panhandle National Forests Weed Pest Management EIS, October, 1989; the Idaho Panhandle National Forests Land and Resource Management Plan (Forest Plan), September, 1987; and the Final EIS Noxious Weed Management Project, Bonners Ferry Ranger District, September, 1995.

Noxious weeds are those plant species that have been officially designated as such by federal, state, or county officials. In *Weeds of the West* by Whitson et. al., weeds are defined as "A plant that interferes with management objectives for a given area of land at a given point in time."

The Federal Noxious Weed Act of 1974 defines a noxious weed as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops or other useful plants, livestock or the fish and wildlife resources of the United States or the public health" (P.L. 93-629).

The Idaho Noxious Weed Law defines a "noxious weed" as any exotic plant species established or that may be introduced in the state which may render land unsuitable for agriculture, forestry, livestock, wildlife, or other beneficial uses and is further designated as either a state-wide or county-wide noxious weed (Idaho Code 24 Chapter 22).

The State of Washington has developed the State noxious weed list "... of those plants which the state noxious weed control board finds to be highly destructive, competitive, or difficult to control by cultural or chemical practices..." They further categorize weed species as Class A if they pose a serious threat to the state. Class B species pose a serious threat to a region of the state. Class B "designate" species are Class B noxious weeds whose populations are such that all seed production can be prevented within a year. Any other noxious weeds are Class C.

Both Federal and State laws define noxious weeds primarily in terms of interference with commodity uses of the land. However, the impacts of noxious weeds on non-commodity resources such as water quality, wildlife and natural diversity are of increasing concern.

Scope of the Proposed Activities

Within the boundaries of the Priest Lake Ranger District, there are approximately 323,000 acres of National Forest lands and 37,000 acres of private lands. The project area includes only the National Forest lands.

An aggressive control program can reduce the infestation of weeds in the Priest River Ecosystem. Treatment is proposed on 128 sites on the Priest Lake Ranger District of the Idaho Panhandle National Forests. Infestations on these specific locations would be treated with an integrated pest management approach. Because initial treatments would not be 100 percent effective in controlling the weeds, two additional years of followup treatments would be needed. Reduced levels of treatment would continue for five to ten years. Treatments after the first year would be on progressively smaller patches of weeds as control efforts take effect.

In many areas the weed infestation does not involve 100 percent of the ground. For instance, a dispersed camping area approximately two acres in size might be infested with weeds. But the amount of land actually occupied by weeds would be in scattered clumps covering only a few feet square. Therefore, actual treatment for noxious weeds may be confined to a smaller area than that reflected in the total site acreage.

In future years it is possible that new infestations of weeds will be discovered. Many of these may be small enough to control manually. However, others may require more aggressive treatment. As a worst case, this EIS assumes that the infestation acreage and treatment increases by 20 percent annually over current levels.

Methods of treatment include manual and cultural controls such as hand pulling, clipping and mowing; release of biological control agents such as parasites and pathogens; and chemical control through the use of herbicides.

The proposed action does not include aerial application methods.

Noxious weeds have also invaded private lands within the boundaries of the Priest Lake Ranger District. However, private lands are not included in the proposed action. These lands are scattered and occur largely on the southern portion of the District. There are isolated parcels owned by timber industry companies, which are managed for timber production. The bulk of the private land, however, is individual residential or commercial property.

Scope of the Analysis

NEPA requires analysis of three types of effects: direct, indirect, and cumulative.

Direct effects are caused by the action and occur at the same time and place as the proposed action. Indirect effects caused by the action occur later in time or are removed in place. Cumulative effects are the combined effects of direct and indirect effects. These and other reasonably foreseeable direct, indirect, and cumulative effects are disclosed in Chapter IV.

It is recognized that separate activities can combine and interact to increase impacts beyond the effects of individual actions. For example, herbicide runoff from one spray site would not harm aquatic organisms; however, when combined with runoff from other sites the total impact could be greater. Such actions would be ***cumulative***, and their cumulative impacts must be addressed.

Other effects sometimes result from ***connected*** actions. For example, if a road were being built to access a timber harvest, the road construction would be connected to the harvest. The rationale for road construction would be diminished in the absence of the timber harvest. The effects of these connected actions would be analyzed together.

The actions proposed here would be a continuation and expansion of weed control efforts conducted since 1989 on the Priest Lake Ranger District. This program includes monitoring and mapping of infestation sites, public education efforts, cleaning of equipment in certain situations, restoring disturbed areas that might otherwise facilitate the establishment of exotic species, and other activities. Past weed control management is discussed in greater detail in the section Existing Weed Infestation and Control Methods.

The environmental impacts of these other program activities is small, and their primary effect is to forestall the types of activities proposed in this EIS. Therefore, discussion of these other control activities is limited in this EIS.

Regulations also call for a disclosure of effects of reasonably foreseeable ***similar*** actions, such as those that share a common timing or geography. For example, it is possible that new noxious weed establishments may occur within the areas analyzed in this EIS. To the extent this can be planned for, the effects of controlling new infestations are analyzed in this EIS. Should future management require actions outside the scope of analysis in this EIS, further site-specific analysis would be required at that time.

Range of Alternatives

Three types of alternatives were developed and analyzed: the No Action Alternative, the proposed management activities, and another reasonable alternative course of action. Chapter II describes the possible alternatives. Alternatives that have a reasonable likelihood of at least partial success are discussed in detail. It also includes the design criteria established to guide the development of alternatives.

Management Direction

Activities that are planned in the National Forest System involve two different levels of decisions: a general (programmatic) decision for the entire Forest and a site-specific decision for the project area.

Forest Planning

The first decision level involves developing a forest plan that provides overall direction for management of the Idaho Panhandle National Forests (IPNF). The IPNF began implementation of its Forest Plan in September, 1987. The Forest Plan has both forest-wide and management area guidelines that define land uses with anticipated resource outputs.

The Forest Plan Final Environmental Impact Statement (FEIS) contains a general cumulative effects analysis of anticipated actions on a landscape level for such resource values as roadless areas, wildlife populations, and water quality of major drainages. The Forest Plan also establishes standards that help to implement appropriate measures to protect the environment. The standards are also used to measure the actions' effects to ensure that those actions are in compliance with the Forest Plan.

The Idaho Panhandle Forest Plan requires the development of management direction for noxious weeds. The goals and standards for the protection of other resources such as soil and water also have implications for weed-control projects. These standards are reviewed further in the discussion of the resources potentially affected by weed control activities.

Idaho Panhandle National Forests Weed Management Philosophy

The IPNF uses Integrated Pest Management principles in managing various pests, including noxious weeds. These principles are defined in the Forest Service Handbook FSH 3409, on Forest Service Pest Management. The definition states, "A decisionmaking and action process incorporating biological, economic, and environmental evaluation of pest-host systems to manage pest populations." (FSH 3409.11, 6/86)

The IPNF Forest Plan provides the following direction for implementing an Integrated Pest Management program: "noxious weed control will be based on an integrated pest management approach, which includes, but is not limited to, the current practices of inventory, monitoring, some handpulling, and some biological control. Noxious weed control will be conducted in cooperation with counties, other agencies, and private landowners."

A variety of activities can be carried out under an Integrated Pest Management (IPM) program. IPM provides a full range of management alternatives. Inventory, monitoring, and public education are also part of IPM activities. Effective use of an IPM program requires that the Forest Service prioritize treatment activities. The overall IPNF strategy is to contain weeds in currently infested areas and to prevent the spread of weeds to susceptible but generally uninfested areas. The 1989 Final EIS for Weed Pest Management, Idaho Panhandle National Forests describes the management strategy.

Site-Specific Project Planning

The second decision level occurs during a site-specific analysis like this one. This Noxious Weed Control EIS is tiered to the IPNF Forest Plan and accompanying FEIS to allow the EIS to focus on specific issues pertaining to the project area. This EIS is not a general management plan for the project area or a programmatic environmental impact statement. It is a site-specific linkage between the Forest Plan and requirements established by the National Environmental Policy Act (NEPA).

This decision level involves analyzing site-specific proposals, as well as disclosing their environmental effects, to achieve the general guidelines of the Forest Plan. This information will be used by the Deciding Official (the Priest Lake District Ranger) to make a reasoned choice for managing the project area. Refer to the Forest Plan (p. IV-3 through IV-5) for additional information about the relationship between forest planning and site-specific environmental documents.

Forest Plan Designated Management Areas

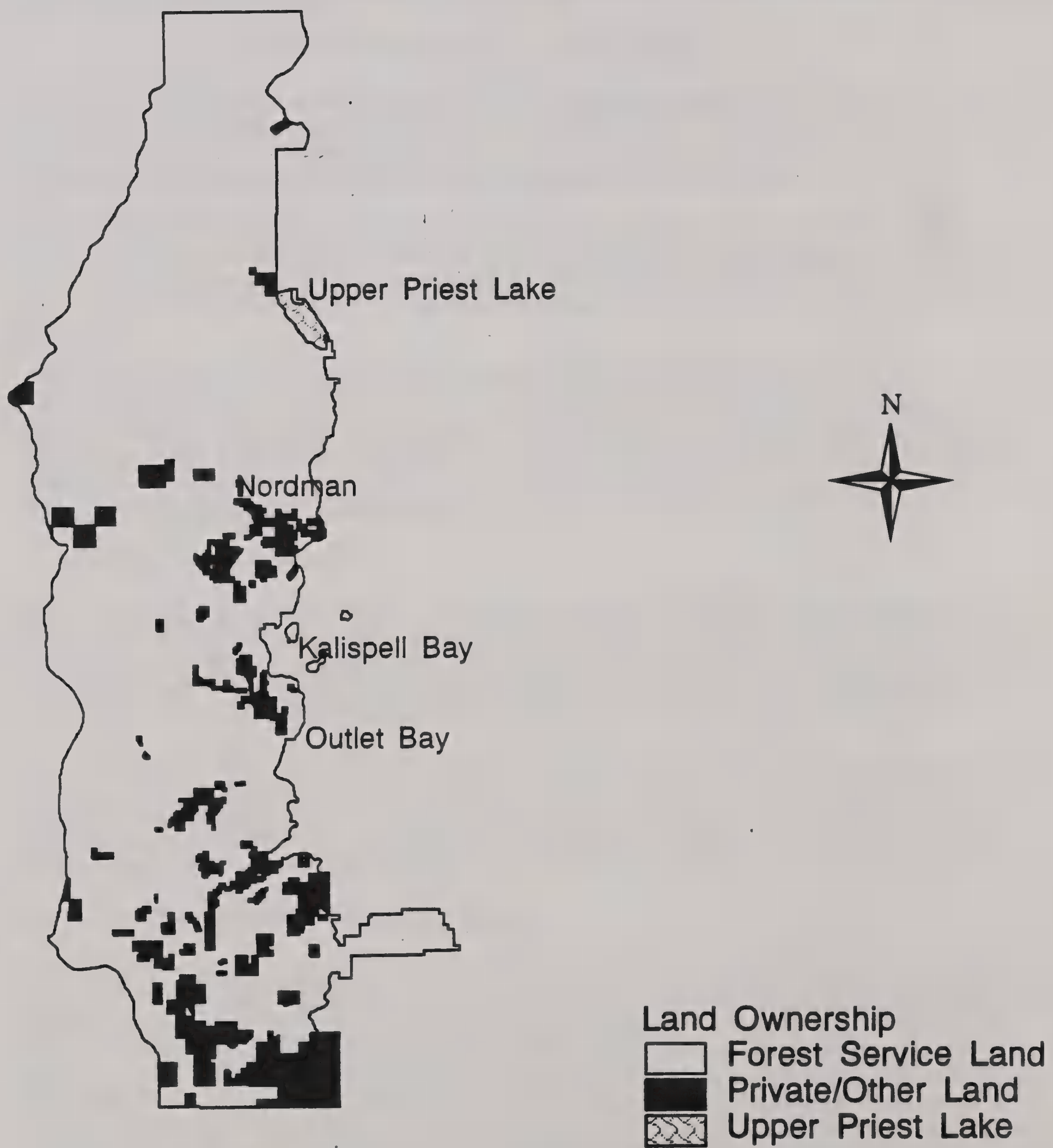
To manage the National Forest lands, the Forest Plan for the Idaho Panhandle designated 19 Management Areas each with different goals, resource potential and limitations. The majority of these Management Areas are found on the Priest Lake Ranger District. They include Research Natural Areas and the Priest River Experimental Forest; the Upper Priest River Wild and Scenic River Corridor; Special Management Areas such as the Upper Priest Scenic Area and the Roosevelt Grove of Ancient Cedars; administrative sites such as the ranger station and lookouts; and developed recreation sites. Other Management Areas are focused on timber production; grizzly bear and woodland caribou recovery; grazing allotments; and semi-primitive recreation. These lands are managed under the concepts of ecosystem management and multiple use of the natural resources. The proposed activities would include all these management areas where there are infestations of noxious weeds.

The Forest Plan contains detailed descriptions of each Management Area.

Decision to be Made

Following a public review of the draft EIS, the Deciding Official will issue a Final EIS and Record of Decision (ROD). The ROD will document what actions, if any, should be taken to control weeds in the Priest River Ecosystem, where treatment should be applied, what type of treatment(s) should be used, and when it will occur.

Map Showing the relationship of USFS and Private/Other land in the Project Area
Figure I-2



CHAPTER II
Description of Alternatives

Chapter II
The Proposed Action and Alternatives

Introduction

This chapter describes the public involvement process and internal scoping used to design and develop the alternatives to the proposed noxious weed treatments. The environmental issues identified by the public and agency personnel are described. The proposed action and alternatives are described and compared. Common features of the alternatives are shown.

Alternative Development Process

Internal Scoping and Public Involvement

The public has been involved throughout the development of the EIS. Public comment has helped define the issues and develop the range of alternatives for accomplishing management goals and objectives. A Scoping Notice was mailed to 112 people on the Priest Lake District mailing list. Notice of the proposed project was also included on the March, 1996 and July, 1996 Schedule of Proposed Actions for the Idaho Panhandle National Forests and mailed to the Supervisor's Office NEPA Mailing List which contains several hundred individuals, organizations, and government agencies.

Public comment was solicited formally with a notice published in the *Federal Register* that indicated our intent to prepare an EIS. Several articles and news features appeared in local newspapers including the *Priest River Times* and *Newport Miner*. The *Priest Lake Newsletter*, a local newsletter printed in Coolin and distributed to over 2000 property owners and summer residents, solicited public input concerning the issue of weeds in the forests. Another article describing the project appeared in the Spring 1996 edition of the *Cooperator*, a publication of the Cooperative Extension Service for Bonner and Boundary Counties. The project file contains copies of these articles. In addition, interested individuals called to discuss the project; records of these conversations were added to the written comments on the project.

From these scoping efforts, a total of 22 letters and telephone calls were received. Seven of the letters were from state or federal government agencies.

The letters contained 94 separate, substantive comments which fell into six subject areas. People discussed weed control, economic/social concerns, travel management, resource concerns, cooperative efforts, and concerns regarding preparation of this EIS.

The public comments and results of the content analysis are contained in the project file at the Priest Lake Ranger District.

Issues

Analysis of public and internal comments resulted in the following list of issues that guided the development of the alternatives. Each issue is stated and is followed by a synopsis of the specific responses received from the public. A brief discussion of how the issue is addressed in the EIS follows the synopsis of public comments.

1. Current and potential impacts of the spread of noxious weeds on the physical, biological, and social environment within the Priest Lake Ranger District.

Several factors are used to measure the effects of noxious weeds. Effects on vegetation are indicated by the number of acres that would be treated. Effects on the aquatic resources are shown by the changes in volume of runoff and sediment yield as well as whether or not changes would be within acceptable limits for fisheries. Effects on wildlife are measured by the changes in habitat for forage dependent species (deer, elk, moose and bear).

Indicators for the social environment are changes in attitudes, loss of land use, changes in lifestyles, and changes in agricultural uses.

Many commenters viewed noxious weeds as a potential problem in the National Forests and are supportive of control efforts. A few people commented that we include noxious weed spread prevention as part of our program.

The Environmental Consequences section of this EIS (Chapter 4) discusses the impacts of noxious weeds on various resources.

2. Potential impacts, effectiveness, and economics of various weed control methods.

The Issue indicators for these issues are: The cost of implementing the alternatives, and effectiveness of various methods of weed control.

Although most commenters acknowledge the potential threat of noxious weeds, some question whether the use of herbicides in the Forest would be appropriate. Some commenters were concerned about the impact of herbicides on the biological resources. Others advocated a full range of control measures, specifying that we try to use as integrated an approach as possible.

A full range of alternatives is developed in this chapter, and the environmental, social, and economic consequences of the alternatives are presented in Chapter 4.

3. Potential effects upon human health from the application of herbicides.

The Issue Indicators are: Potential effects on project workers, and on residents and visitors to the project area.

Some commenters were specifically concerned about the impact of herbicide spraying on human health and on berry and mushroom gathering activities.

The potential impacts of herbicide application on human health have been analyzed extensively. Chapter 4 presents the results of this analysis.

4. The spread of noxious weeds on the right-of-way for State and County roads within the National Forest boundaries.

The issue indicators are: Opportunity for cooperative efforts with State and County agencies. Miles of roadsides treated and cost of treatments.

This issue resulted from discussions with Bonner County and State of Idaho as well as Pend Oreille County noxious weed management coordinators regarding concerns about assistance to control noxious weeds along state and county road corridors within National Forest lands. Boundary County and the State of Washington are also supportive of these efforts.

Each county has a noxious weed control board which is involved with control of noxious weeds. They treat infestations along county roads, provide information, and technical assistance to landowners and other agencies.

Other Issues

Responses from the public and other agencies also discussed concerns with travel management and the preparation of this EIS.

Travel management on the Priest Lake Ranger District is dealt with under the IPNF Forest Plan, the Kalispell Granite Access Management Decision Notice, and other management guidelines and policies. Except for safety related traffic concerns during implementation of a selected weed control alternative, travel management is outside the scope of this analysis and environmental impact statement.

This EIS is prepared in accordance with directions and guidelines found in the National Environmental Policy Act (NEPA), the IPNF Forest Plan, USDA Forest Service policies, regulations, guidelines, and other applicable regulations including INFISH, and Best Management Practices for the states of Idaho and Washington.

Members of the interdisciplinary team are qualified and experienced as described in Chapter 5 under the List of Preparers.

Methods and Practices Available for Noxious Weed Control

The methods and practices available for noxious weed control range from hand-pulling of weeds to herbicide application. There are several specific biological control agents available for the noxious weeds present on Priest Lake Ranger District. Similarly, there exist a wide variety of herbicides which exist on the market. It would have been a tremendous and impractical undertaking to analyze all of them in their wide array of possible combinations. Therefore, the proposed project would use only the control methods discussed in this EIS. They were selected based upon past experience and upon the scientific information available for each method.

The Idaho Panhandle National Forests follow Integrated Pest Management principles in treating invading noxious weed species. An integrated approach would use more than one method to achieve control. Chapter I contains more information on this approach.

The following is a description of what each category of control method involves and what resources are currently available for each control method.

Manual Control

Manual control methods range from hand-pulling and grubbing with hand tools to clipping or cutting the plants with scythes or other cutters. If sufficient root mass is removed, the individual plant can be destroyed. Cutting the plants will reduce reproduction of perennial plants and weaken its competitive advantage by depleting carbohydrate reserves in the root systems.

Cultural Control

Cultural control generally involves manipulating a site to increase the competitive advantage of desirable species and decrease the competitive advantage of undesirable species. Manipulations could involve transplanting native plants to shade out weedy species or covering weed-seed contaminated soil with a layer of uncontaminated soil. Seeding grass species and applying fertilizer on site where ground cover is sparse could help to culturally control weeds.

Biological Control

Biological control is the use of biotic agents to attack undesirable plant species. Populations of native species are generally limited in part by herbivorous and pathogenic organisms as well as by competition for nutrients and moisture. Non-native vegetation has had a dramatic impact in many parts of the West due to the lack of natural biological control agents. The introduction of these control agents is viewed by most experts as the best long-term solution to the noxious weed problem where there are large, widespread populations of a given species.

Before introducing new biocontrol agents into this country, the agent's host-specificity must be tested. Biocontrol agents are placed with a wide variety of plant species under "eat-or-starve" conditions to ensure that their attack is confirmed to a narrow range of plant species and preferably only the weed of concern.

Possible biocontrol agents include:

Currently, two biocontrol agents, *Urophora affinis* and *Urophora quadrifasciatus*, are present in some knapweed infestations on the district. In sufficient concentrations these seedhead flies can reduce seed production by 50 to 90 percent. However, knapweed is such a prolific seed producer that these organisms have had no effect on the density of the infestations and little effect on its rate of spread.

Cyphocleonus achates, Knapweed root weevil. This large root-galling weevil is one of four insects that attack the central vascular tissue of diffuse and spotted knapweed. Eggs are laid in the root crown. Immediately upon hatching, the larvae mine towards the cortex of the root. The adults emerge from early August to mid-September and feed on knapweed leaves, preferring those of young plants.

Metzeneria paucipunctella, Spotted Knapweed seed head moth. The larvae are aggressive and will kill one another or other knapweed seed head-infesting larvae, including the gall flies. Larvae enter the open flowers and feed on the florets, seed and receptacles. Although there is strong competition among the seed head moths, knapweed seed production is reduced the most when all three species [*Urophora affinis*, *Urophora quadrifasciatus*, and *Metzeneria paucipunctella*] are present.

Chrysolina quadrigemina is a defoliating beetle which attacks St. Johnswort or goatweed. This defoliating beetle has successfully reduced the density of this weed in locations where fall temperatures are mild and the rainfall is abundant. There have been introductions of this beetle annually on the Priest Lake and Bonners Ferry Ranger District since 1990. The beetle is thriving and is found at several locations on the district. There is evidence of St. Johnswort populations suffering the effects of defoliation by this beetle.

Longitarsus jacobaeae, Ragwort flea beetle. The flea beetle is a highly successful biological control agent for tansy ragwort. The larvae mine the roots of the rosettes which may cause plant mortality in the spring. The adults feed on the leaves and rosettes during the late fall and winter can kill plants.

Tyria jacobaeae, Cinnabar Moth. The cinnabar moth, in conjunction with the ragwort flea beetle , has been proven to be very effective in controlling tansy ragwort in northern California, Oregon and Washington. The larvae strip the foliage and destroy the flowers and often leave bare stalks. The moth have been effective in reducing stands of tansy ragwort and reducing seed densities.

Several biological agents are currently being introduced into the United States for the control of Canada thistle. *Ceutorhynchus litura* is a stem mining weevil which attacks the young Canada thistle plants in early spring. The stem mining larvae internally attack the elongating stem in early summer. As the larvae develop they begin to create numerous exit holes near the root crown leaving the plant susceptible to a variety of plant pathogens. Under ideal circumstances (soil, size of infestation, climate etc.) population densities may be reduced up to 90 percent depending on the number of weevils released at the infestation (Rees, 1992).

Urophora cardui is a stem and shoot gall fly which attacks Canada thistle. Adults deposit their eggs on the axil of the stem in early summer. As the larvae develop they burrow into the stem creating a walnut size bowl or gall. The gall formation diverts the normal nutrient translocation away from the metobolic and reproductive systems of the plant. As a result flowers develop abnormally, and seed production is reduced.

Both of these insects were treated for host-specificity. *Urophora cardui* showed a very narrow range of attack. When tested against 17 closely-related members of the composite family, this insect laid eggs virtually only on Canada thistle (Peschken and Harris 1975). The only other incidents of egg-laying were 1 of 21 females oviposited on a bull thistle (*Cirsium vulgare*) and 1 of 21 females oviposited on a plumeless thistle (*Carduus acanthoides*). Both of these thistle species are also non-native.

Ceutorhynchus litura has a somewhat broader host range than *Urophora cardui*. It will attack a wider variety of plant species of *Cirsium*, *Silybum*, and *Carduus* (Zowolfer and Harris 1965). There are several native plant species in Montana that belong to the *Cirsium* genus. As this insect species spreads, it could affect the populations of these species in some areas, but it is unlikely to cause their extinction. At the present time there are no sensitive *Cirsium* species on the Priest Lake Ranger District.

The impacts of the introduction of these biocontrol agents [*Ceutorhynchus litura* and *Urophora cardui*} on Canada thistle are difficult to predict. Both species are reported to reduce Canada thistle densities on some sites by as much as 80 to 90 percent (Rees 1992). However, it is not certain that these insect species would adapt to climatic and site conditions in the proposed treatment areas. In some cases noxious weed species have adapted to conditions outside the climatic or habitat range of their potential biocontrol agents.

If these insect species do adapt to site conditions in northern Idaho, they could reduce the density of these infestations of Canada thistle. Canada thistle would likely continue to spread slowly through suitable habitats, but its competitiveness against native species would be greatly reduced. If the insect species did not establish on these sites within a reasonable timeframe or did not flourish once established, other alternatives, including no-action, would have to be considered.

It should be noted that biological control agents would not completely eradicate a noxious weed infestation. Rather, a biological control strategy would still allow the weed species to spread, though at lower density, through all suitable habitats in the forest. Biological control agents do eradicate a target or non-target plant species. Rather, under ideal circumstances, the control agents instead will reach a dynamic equilibrium with the plant species.

Biological control techniques have been used on the District to a lesser extent and the effectiveness have not yet been determined. Some characteristics of biological control techniques are that they do not usually result in a significant decrease in the host (noxious weed) but rather serve to reduce the rate of spread and viable seed production. Also the benefits of biological control are often not realized for many years. Biological control is most effective when used in combination within other types of treatments such as cultural and chemical. Control of the noxious weed infestation on many of the treatment sites would likely not be achieved if biological control were the sole method of control that was used.

Chemical Control

Seven herbicides: 2,4-D; dicamba; clopyralid; glyphosate; picloram, and triclopyr and metsulfuron methyl were considered for application on various sites. Three chemicals were approved for use in the 1989 IPNF Weed Pest Management EIS (2,4-D, glyphosate, and picloram). Each herbicide would be used depending on weed species, level of infestation, location, other resource concerns, and applicability of the herbicide. The target plants would include those noxious weeds identified on state and county weed lists. The EPA has established application guidelines for each herbicide concerning the proper application and application rates. These requirements are found on the label of each herbicide; according to federal and state laws, these requirements must be followed. All herbicide application proposed in this document would adhere to the label requirements.

2,4-D is a herbicide with very little persistence in the environment. 2,4-D has several formulations, some of the common brand names include, Weed-B-Gon, HiDep, and Solution. The herbicide has low toxicity to aquatic species and several formulations are approved for use in water and near water. At application rates of 1 to 1.5 pounds per acre, 2,4-D exhibits good control of knapweed with repeat applications and moderate control of goatweed, houndstongue, sulfur cinquefoil, and Canada thistle.

Dicamba (the active ingredient in Banville) is a broad-leaf herbicide that is readily absorbed by leaves and roots and is concentrated in the metabolically active parts of the plants. Dicamba is effective against a similar range of weed species as 2,4-D at similar application rates. However, dicamba is somewhat more persistent than the 2,4-D herbicide and therefore provides somewhat longer control of susceptible species.

Picloram (the active ingredient in Tordon) controls a variety of broad-leaved weed species, including all the weeds species-of-concern here. Picloram is generally applied at rates of one-quarter to one-half pound per acre. However, picloram's combination of mobility and persistence have generated concern over possible ground-water contamination. Possible environmental impacts are compared between this method and the other chemical and non-chemical control methods.

Glyphosate is a non-selective, broad-spectrum herbicide that is absorbed by leaves and translocated throughout the plant. Glyphosate has little soil activity and its absorption by roots is minimal to non-existent.

Due to its non-selectivity, glyphosate tends to eliminate both desirable and undesirable vegetation. Even if desirable vegetation is reseeded, hawkweed and other noxious weeds maintain their competitive advantage. In general, noxious weeds are aggressive pioneer species that are well-adapted to disturbance. For example, knapweed seed can remain viable for over 10 years in the soil, and this seedbank provides a ready source for reinfestation.

Clopyralid is a relatively new herbicide that is very selective and is toxic to some members of only three plant families: the composites, the legumes, and the buckwheats. Clopyralid is the active ingredient in Transline, and along with 2,4-D, is one of two active ingredients in Curtail. At application rates of one-quarter to one-half pound per acre, clopyralid is very effective against knapweed, the hawkweeds, and Canada thistle. However, it does not control any of the other weed species of concern. Clopyralid is more persistent than 2,4-D and dicamba, but less persistent than picloram.

The selective nature of clopyralid makes it an attractive alternative on sites with non-target species that are sensitive to the other herbicides. Clopyralid has soil-mobility characteristics comparable to picloram, so the possibility of ground-water impacts must be addressed.

Triclopyr is a selective herbicide used in a variety of vegetation management situations such as controlling weeds or controlling vegetation in powerline, railroad, pipeline, and road rights-of-way. It is the active ingredient in Garlon 4, an effective herbicide in controlling brush using foliar, basal bark, and cut-stump treatments. It is often mixed with other chemicals at varying rates to improve effectiveness and reduce the amount of herbicide applied. Triclopyr degrades rapidly in soil and water.

Metsulfuron methyl is used for control of annual and perennial broad-leaf weeds. Control areas include rights-of-way on roadsides and powerlines. The most commonly used formulation is Escort. Metsulfuron methyl can be mixed with other chemicals to provide more effective control. Degradation of this herbicide is by hydrolysis and microbial action.

Control with a combination of chemical and non-chemical methods

Site conditions such as vegetation types, soil types, and infestation levels vary significantly on some sites under consideration in this EIS. Therefore a combination of chemical and non-chemical methods may be selected for some sites. The selection of a herbicide alternative for a site would not prevent the application of manual methods either concurrently, or as a follow-up treatments, on remnant weeds on a site.

Control with mixtures of herbicides

Many control specialists treat several noxious weed species with mixtures of chemicals. There are several reasons for using a mixture of chemicals. Sometimes one chemical by itself will not be effective against a certain weed species, but combining two chemicals may provide better control. Depending on the biology of the weed, the environment in which it is growing, and the population size, one chemical may be sufficient and sometimes a mixture of two is needed. This is the case for weeds that are somewhat resistant to an individual herbicide. Applicators can utilize mixtures to reduce the number of applications required to control resistant weeds.

For example a mixture of picloram and 2,4-D is used for many weed species. Both herbicides are broad leaf selective but inhibit the plant in different manners. 2,4-D generally has a shorter half life and picloram provides longer persistence. Together these two herbicides provide adequate control of weeds that may not be provided individually. The addition of 2,4-D to picloram also reduces the amount of picloram to half of what is normally applied, and therefore reducing the amount of effects on non-target species.

Alternatives Considered In Detail

Features Common to All Alternatives

Alternative development includes outlining the features that are common to all the alternatives. These include "givens" dictated by laws or policies. Other features respond to issues brought up during internal or public scoping, such as notifying adjacent landowners prior to starting weed control activities in an area. Common features can also mitigate potential effects of alternatives. Such an example is the use of traffic control and signing during treatment activities to ensure safety of workers and motorists.

Rather than repeat these features, also referred to as "design criteria" for each alternative, they are listed once as Features Common to All Alternatives. Alternative C includes a listing of design criteria developed specifically for the application of herbicides. These features would mitigate potential negative effects of herbicide use.

Noxious Weed Prevention and Control

1. Certified weed-free feed would be required for use within the Salmo-Priest Wilderness beginning in 1997 (36 CFR 261.50). Certified noxious weed-free forage would be required on all public lands on the Priest Lake Ranger District by the year 2000.

2. All gravel pits on the Priest Lake Ranger District would be treated for noxious weeds.

3. Cleaning of equipment would be required before operating within all areas previously treated for noxious weeds or within areas currently considered weed-free. Contract clause 10.2 would be included.

4. Provisions would be made for the prevention and control of noxious weeds within new and existing special use permits as needed.

5. Developed campgrounds, trailheads, and high-use, dispersed campsites would have noxious weeds control following the standards and guidelines outlined within this document.

6. All noxious weeds which are manually controlled (pulled) would be bagged and disposed of at designated sites to be burned.

7. New noxious weed invaders, as identified by the local and state agencies, would be treated as funding is available.

8. To prevent the establishment and spread of noxious weeds, all ground disturbances which are the result of management activities would be revegetated with an appropriate seed mix and fertilized as necessary.

9. Use of native species would be preferred for revegetation following treatment of noxious weeds within closed road systems and within unique and important habitats.

10. Revegetation of all treated areas would use a certified noxious weed-free seed.

11. All noxious weed control activities would comply with state and local laws and agency guidelines.

Public Safety

1. An annual operating plan outlining proposed treatment areas would be available to the public at the Priest Lake Ranger District office.

2. Adjacent landowners and grazing allotment permittees would be notified prior to treatment of noxious weeds on National Forest lands.

3. Public safety guidelines would comply with state and local laws, and agency policy.

4. Traffic control and signing during noxious weed treatment operations would be used as needed to ensure safety of workers and motorists.

Resource Protection

1. For noxious weed treatment within grizzly bear recovery areas, administrative use guidelines would be followed (Appendix D).

Description of Alternatives

Three alternatives were developed to address the public and internal issues. These alternatives represent the range of control methods currently available for treatment of noxious weeds. In addition to the No Action alternative, one alternative involves only non-chemical methods of control. The comparison of Alternatives B and C, with C being an integrated program including the use of herbicides, defines the issue of possible human health and environmental impacts of chemical use. The analysis of the No Action alternative discloses the consequences of unchecked expansion of noxious weeds in the Forest.

The alternatives are outlined below with a brief discussion of the major issues relevant to these alternatives. Each action alternative utilizes a combination of treatment methods. These treatment methods are discussed in greater detail in the section above [Methods and Practices Available for Noxious Weed Control].

Alternative A: No Action

This alternative would not result in a change in the current noxious weed control activities on the Priest Lake Ranger District. Current strategies for noxious weed control as outlined in the Idaho Panhandle National Forest Plan (USFS, 1987) and the Idaho Panhandle National Forest Noxious Weed Environmental Assessment (USFS, 1987b) would still be considered the primary strategy. Only a small portion of the identified treatment sites would have noxious weeds controlled. Essentially, only timber sale areas where funding would cover weed treatments, and administrative sites such as the Priest Lake airstrip would be treated. The cost of this alternative would be $24,000 over the next three years.

Aggressive control of the existing noxious weed infestation would not occur. Control of established noxious weeds would occur only on a limited area as stated above. New noxious weed invaders would be controlled as they are detected and as funding permits. Opportunities to establish partnerships to control noxious weeds with the states, counties, permittees and adjacent landowners would not occur. This alternative accepts the fact that noxious weeds would become an established part of the ecosystem.

Alternative B: Manual, Cultural and Biological Treatment

Alternative B was developed in response to concerns for possible impacts on human health from the use of herbicides. Under this alternative, treatments such as hand-pulling, clipping and mowing would be supplemented with the release of biological agents. These agents could include parasites, predators or pathogens that have shown some promise in reducing weed infestations.

This alternative allows us to examine the possible impacts of introducing insect species that show some promise in bringing exotic plant species into better balance in the ecosystems.

This alternative would use a variety of treatments to control noxious weeds. It would cover a total of 2,636 acres infested to varying degrees by noxious weeds. Actual treatment would be undertaken on approximately 320 acres. No herbicides would be used. Only manual, cultural and biological control methods would be used to treat noxious weed populations. Projected cost of fully implementing Alternative B over a three-year period is $1,130,000.

Manual Control Used on 80 percent of the treatment areas, manual control would involve hand-pulling and digging. All noxious weeds pulled or dug would be bagged and burned at proper locations on the district, as specified in the design criteria.

Noxious weeds would be treated by this method on approximately 1,640 infested acres for a total of 256 acres of manual treatment.

Manual and Biological Control A combination of hand-pulling and biological control would be used on 16 sites within the project area. A total of 754 acres of noxious weed infestation would be treated which would equate to 41 acres of control.

Manual (Mowing) and Biological Control This combination of treatments would be used on 17 acres of noxious weeds in an attempt to control the infestation on a total of 201 acres. Treatment areas include the Priest Lake Airstrip and along the portions of State Highway 57 which are within the National Forest boundary.

The manual treatment would focus primarily on mowing. Approximately 17 acres would be mowed adjacent ot Highway 57. This would not kill the plant but would reduce the number of seedhead that are produced. The biological treatment would focus primarily on knapweed.

The biological agents available for use are listed below with the weed species to be treated.

Noxious Weed Species	Biological Control Agent(s)
knapweed	*Urophora affinis* (Banded gall fly), *Urophora quadrifasciatus* (UV knapweed seed head fly), *Metzeneria paucipunctella* (Spotted knapweed seed head moth), and *Cyphocleonus achates* (Knapweed root weevil).
St. Johnswort (goatweed)	*Chrysolina quadrigemina* (defoliating Klamath weed beetle).
tansy ragwort	*Longitarsus jacobaeae* (Ragwort flea beetle), and *Tyria jacobaeae* (cinnabar moth).
Canada thistle	*Ceutorhynchus litura* (Stem mining weevil) and *Urophora cardui* (gall fly)

Examples of areas where this type of treatment would occur include the following: site 7 - the 656 road system, site 8 - Hemlock Loop road system and associated spurs, site 10 - Hughes Ridges road systems, site 26 - Media Creek road system, site 58 - Kalispell Island, and Sites 36, 66, 67, 73 - powerline corridors.

Biological Control Use of only biological control is proposed on one area, site 102 - Foggy Bottom Wetland along Moores Creek. This infestation of St. Johnswort would be treated with the appropriate biological agent.

Cultural Control Cultural control as described in a previous section Methods and Practices Available for Noxious Weed Control and as specified in Features Common to All Alternatives would be applied on all treated acres.

ALTERNATIVE B

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	TREAT ACRES	CONTROL ACRES	RESOURCE CONCERNS
1		SALMO PRIEST WILDERNESS AREA	T40N R46E, T39N R46E, T38N R46E	Hand Control		88.79	4 45	Wilderness, Research natural Areas
2	1013	0.5 Mi E OF HUGHES FK TO CONTINENTAL GATE	T63N, R5W; T64N,R5W;T65N R5W	Hand Control	7 3	49.31	5 81	Major Corridor
3	1383	1388 ROAD BEHIND LIME CREEK GATE	T64N, R5W, SEC 1, 2, 12	Hand Control	4.5	6.55	0.24	Access to Roadless Area
4	2764	2764 ROAD SYSTEM	T64N, R5W, Sec 25, 26, 36.	Hand Control	8.4	12.22	1 09	Unique habitats
5	1014	BOULDER MEADOWS ROAD	T62N, R5W, Sec 3 and 4.	Hand Control		5.53	0 12	Unique habitats
6	1327, 1327A, 1327C	1327 ROAD SYSTEM	T63N R5W S 10,14,15	Hand Control	4.9	7.12	2.04	Access to Scenic Area
7	656, 656A, 656C	656 ROAD SYSTEM	T38N R45E S 1,2,3,11,12,13 T63N R5W S 17,18	Hand Control/ Biological	9.25	17.97	1.77	Access to Wilderness
8	1127, 1127A	HEMLOCK LOOP ROAD AND SPUR A	T38N R45E S 2,10,11,12,14	Hand Control/ Biological	8.1	9.81	0.29	Access to Wilderness
9	1382, 1382A, 1382B, 1382C	1382 ROAD SYSTEM	T63N R5W 16,17,21	Hand Control	7.1	13.78	0.41	Access to Roadless Area
10	1343, 1343C	HUGHES ROAD TO CABINET PASS	T63N R5W S 4,9 T64N R5W S9,16,22,27,28,33,34	Hand Control/ Biological	11.7	17.02	2 88	Access to Wilderness, Unique Habitats
11		LEDGE CREEK SALE UNITS	T63N R5W S 4,5,8,9,16,17	Hand Control		60	20	Major weed source near wilderness
12		GRAVEL PIT OFF ROAD 656	T63N R5W S17	Hand Control		7	3.5	Major weed source
13	1013	GRANITE PASS TO 0 5 Mi E OF HUGHES FK	T38N R45E S 11 T63N R5W S 9,10,16,17,19,20	Hand Control	12	6.58	0 37	Major Corridor
14	401, 401A, 401B, 1015	401 AND 1015 ROAD SYSTEM	T38N R45E S 13 T63N R5W S 19,20,21,28,29,33,34 T62N R5W S 2,3	Hand Control	14.47	29.46	0.73	Access to Roadless Areas
15	302	STATELINE TO GRANITE PASS	T62N R45E S 2,11,12,13 T38N R45E 24,25,26,35	Hand Control	7.1	17	1 07	Weed corridor
16	302	NORDMAN TO STATELINE	T61N R5W S 2,3,11,12 T62N R5W S 28,29,30,33,34	Hand Control	6 9	16.94	1 07	Weed corridor
17		HARVEST UNIT ALONG RD 302 W OF GRANITE PASS	T38N R45E S 13,24	Hand control		25	15	Major weed source
18	302, 302B, 302C	GRANITE PASS TO PASS CREEK PASS	T38N R45E S 13,14,15,16,23	Hand Control	8.6	13.29	2 16	Major corridor, Access to Wilderness
19	311	FROM RD 302 TO 308	T62N R5W, T37N R45E, T36N R45E	Hand Control	8.6	16.68	0 24	Access to Roadless, Unique habitats
20	1122, 1122A, 1122B, 1122C 1122D, 1124 1124A, 1124B	1122 AND 1124 ROAD STYSTEM, AND KGB TEMP ROADS	T38N R45E S 15,16,17,21,22,28	Hand Control	32.39	54.36	3 68	Access to Roadless Area
21	1362	FROM RD 302 TO INDIAN MOUNTAIN / REEDER MOUNTAIN SADDLE	T61N R5W S5, T62N R5W S 32,33	Hand Control	6.5	15.76	1 21	Major Corridor
22	319, 1104	CACHE CK AND HARVEY GRANITE ROADS	T37N R45E S 14,20,21,22,23,27	Hand Control	13	18.91	0.29	Access to Roadless Areas
23	1341, 1341A	1341A AND 1341 ROADS FROM 302 TO BEAVER PASS	T62N R5W	Hand Control	6.9	15.34	3 49	Weed corridor
24	1373	ROAD 1373 AND 1373A	T62N R5W S 9,10,15,16,21,22	Hand Control	6.8	8.24	0.48	Weed corridor
25		GRAVEL PIT ALONG ROAD 638	T62N R5W S 24	Hand Control		5	1.5	Weed source
26	1347, 1347A	MEDIA CK ROAD SYSTEM	T61N R5W, T61N R4W, T62N R5W, T62N R4W	Hand Control/Biological	8.4	16.29	0.78	Weed corridor

ALTERNATIVE B

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	TREAT ACRES	CONTROL ACRES	RESOURCE CONCERNS
27	1340, 1340A, 1340B, 1340C, 1340D, 1340E, 1340F	1340 ROAD SYSTEM	T61N R5W S1, T62N R5W S36	Hand Control	7.2	11 58	5 36	Weed corridor
28	638	FROM ROAD 302 TO TANGO PASS	T62N R5W S24,25,26,27,34	Hand Control	5.4	10.47	1 21	Access to Roadless Area
29		TRAIL IN ROOSEVELT GROVE	T38N R45E S 23,26	Hand Control		2	0 25	Major Recreation site
30	1341	FROM BEAVER CREEK CAMPGROUND TO BEAVER PASS	T62N R4W, T62N R5W	Hand Control	8.4	12.22	1 94	Access to Roadless Area
31		BEAVER CREEK RECREATION SITE	T62N R4W S9	Hand Control		0	0	Major Recreation Site
32	638	ROAD 2512 TO TANGO PASS	T62N R4W S 19,20,21,30 T62N R5W S 24	Hand Control	4	7.76	0 24	Access to Roadless Area
33		AIRSTRIP IN FRONT OF PRIEST LAKE RANGER STATION	T60N R5W S 2,11	Mowing/Biological		50	25	Major Weed source
34		HANNA PIT REFUSE SITE GRAVEL PIT	T60N R5W S 3	Hand Control		20	10	Major weed source
35		FROM NORDMAN TO MILE POST 30	T61N R5W, T60N R5W	Mowing	4	24.24	2 42	
36		NORTHERN LIGHTS POWERLINE RIGHT OF WAY WITHIN KALISPELL CREEK DRAINAGE AND KGB TEMP ROADS WITHIN KALISPELL CREEK DRAINAGE	T60N R5W, T61N R5W	Hand Control/Biological	25	82.12	2.4	Major Weed source
37	1333	KALISPELL BAY ROAD	T60N R5W S 11,12	Hand Control	1.5	5.45	0 73	Weed corridor
38	1345	ROAD 1345 FROM HANNA FLATS ROAD TO LAMB CREEK ROAD	T60N R5W S9,16,21	Hand Control	4	5.82	1 45	Weed corridor
39	502, 1355	ROAD 502 AND 1355	T60N R5W, T61N R5W	Hand Control	3	8.72	2.9	Weed corridor
40	1362 & SPURS	ROAD 1362 FROM ROAD 308 TO REEDER MTN/INDIAN MTN SADDLE INCLUDING SPURS TO INDIAN MTN LOOKOUT	T61N R5W, T36N R46E, T37N R45E	Hand Control	16.5	35.16	2 37	Major corridor
41		GRAVEL PIT ALONG ROAD 1362	T61N R5W S20	Hand Control		4	2	Major weed source
42	308	KALISPELL CK ROAD FROM HIGHWAY TO DISTRICT BOUNDARY	T61N R5W, T36N R45E	Hand Control	12.5	22.4	1 21	Access to roadless Areas
43	337, 2119,2120	HUNGRY AND RAPID CREEK ROADS	T36N R45E	Hand Control	5.1	10.96	1 72	Access to Roadless Area, unique habitats
44	657, 657B, 657C, 1110, 1110A	DIAMOND PEAK ROADS	T36N R45E, T36N R46E, T61N R5W	Hand Control	11.9	22	3 45	Weed corridor
45	1351	BATH CREEK ROAD AND SALE UNITS	T60N R5W S 5,6, T61N R5W S 29,32	Hand Control		60	10	Unique habitats
46	1395	REYNOLDS CREEK ROAD SYSTEM	T60N R5W S 11,13,14,23	Hand Control	3.5	5.09	0.39	Weed corridor
47		GRAVEL PIT OFF ROAD 308	T61N R5W S 34	Hand Control		4	2	Major weed source
48		OLD GRAVEL PIT AT KALISPELL BAY ROAD AND JUNCTION WITH HIGHWAY 57	T60N R5W S 11	Hand Control		15	14	Major weed source
49	308B	ROADS 308B &308C AS WELL AS OLD CCC CAMP MEADOW	T36N R46E S19, T36N R45E S24	Hand Control	0.3	10.44	0 69	Unique habitats
50		TRAIL TO KALISPELL ROCK	T36N R45E S 8,9,10	Hand Control	4	5.82	0 24	Recreation site

ALTERNATIVE B

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	TREAT ACRES	CONTROL ACRES	RESOURCE CONCERNS
51		PORTIONS OF BARTOO ISLAND	T60N R4W S 16,17,20			1	0.5	Recreation site
52	313, 313A, 313B, 313D, 313E, 313F	ROAD 313 SYSTEM	T60N R5W, T61N R5W	Hand Control	12.55	17.11	2 12	Weed corridor
53		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T61N R5W, T61N R4W	Hand Control/Biological	8	38.78	0.97	Weed corridor
54	238	ROAD TO BISMARK WORK CENTER	T61N R5W S 23	Hand Control	1.4	3.39	0 39	Weed corridor
55	1324, 1324A, 1324B	REEDER MOUNTAIN ROAD SYSTEM	T61N R5W S 4	Hand Control	3.8	5.53	0 33	Weed corridor
56	1339	REEDER BAY ROAD NORDMAN TO GRANITE CREEK	T61N R5W S 23,24, T61N R4W S 16,17,19,20	Hand Control	4	14.55	2 18	Weed corridor
57	2231	REEDER CREEK ROAD	T61N R5W S14,15,16,21	Hand Control	3	7.27	1 94	Weed corridor
58		PORTIONS OF KALISPELL ISLAND	T60N R4W S8 9	Biological/Hand Control	3 AC	3	1	Recreation site
59	2512	LAKESHORE ROAD GRANITE CREEK TO BEAVER CREEK	T61N R4W, T62N R4W	Hand Control	7.8	15.13	0 73	Weed corridor
60		NAVIGATION CAMPGROUND	T63N R4W S 19	Hand Control		5	1	Recreation site
61	TRAIL 365	TRAIL 365 ELKINS TO KALISPELL BAY	T60N R4W S 6, T61N R4W S 19,30,31	Hand Control		3	0.5	Recreation site
62	TRAIL	LAKESHORE TRAIL #294	T61N R4W, T62N R4W	Biological/Hand Control	10	14.85	1 62	Recreation site
63		KALISPELL BAY BOAT LAUNCH	T60N R5W S 12	Hand Control		5	1	Recreation Site
64	237	ROAD 237 OUTLET TO KALISPELL BAY	T59N R4W, T60N R4W, T60N R5W	Hand Control	8 8	12.8	0 24	
65	2249	DISTILLERY BAY TIMBER SALE ROAD SYSTEM	T 61N R4W S 5, T62N R4W S 29,30,31,32	Hand Control	4.5	6.55	0 73	Unique habitats
66		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T60N R4W, T60N R5W	Biological/Hand Control	20	97.45	2 01	Major weed corridor
67		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T59N R4W, T59N R5W, T60N R4W, T60N R5W	Biological/Hand Control	5	24.24	0 61	Major weed corridor
68	57	HIGHWAY 57 WITHIN THE LAMB CREEK DRAINAGE	T60N, R5W, S 23, 26, 26, 36, T60N, R4W ; T59N R4W, T59N R4W, T60N R4W, T60N R5W	Biological/Hand Control	3	18.18	2 42	major weed corridor
69	310	LAMB CREEK ROAD TO GLEASON MOUNTAIN	T60N R5W, T35N R46E, T35N R45E, T36N R45E	Hand Control	12	19.88	2 02	Weed corridor
70	219	LAMB CREEK CONNECTION ROAD WITHIN LAMB CREEK DRAINAGE	T60N R5W	Hand Control	6.5	5.09	0.19	Weed corridor
71	1048	WOODRAT MOUNTAIN ROAD HILLS TO OUTLET BAY	T59N R4W S 6, T60N R4W S 30,31, T60N R5W S 24,25	Hand Control	4.8	9.31	0 87	
72	659	SOLO CREEK ROAD	T34N R45E S 1,2,3,5,8,9,10	Hand Control	10.68			Weed corridor
73		NORHTERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T58N R5W, T59N R5W, T59N R4W	Biological/Hand Control	15	72.73	2 42	Weed corridor

ALTERNATIVE B

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	TREAT ACRES	CONTROL ACRES	RESOURCE CONCERNS
74		CHIPMUNK RAPIDS SKI TRAILS	T59N R4W S 19,30,31, T59N R5W S 24,25	Hand Control		50	5	Recreation site
75		GOOSE CREEK MEADOWS	T59N R5W S30	Hand Control	40 AC	40	2	Prime rangelands
76		KANIKSU MARSH RNA	T59N R5W S25	Biological/Hand control		30	5	Research natural Area
77		MEADOW SOUTH OF 1075 BRIDGE ALONG UPPER WEST BRANCH	T35N R45E S 25	Hand Control	5	10	1	Prime rangelands
78		MEADOW ALONG UPPER WEST BRANCH AND ROAD 312 JUST NORTH OF GREENHOOD ROAD JUNCTION	T59N R5W S 17	Hand Control	7	7	1.5	Prime rangelands
79	57	HIGHWAY 57 WITHIN THE UPPER WEST BRANCH DRAINAGE	T58N R5W, T59N R4W, T59N R5W	Mowing/Biological Contro	5	30.3	2.42	Major corridor
80	219	ROAD 219 WITHIN THE UPPER WEST BRANCH DRAINAGE	T35N R45E S 13,24	Hand Control	3	4.36	0.15	Weed corridor
81	312	SQUAW VALLEY ROAD FROM HIGHWAY 57 TO PYRAMID PASS	T59N R5W, T34N R46E, T35N R45E	Hand Control	18.4	41.36	4	Weed corridor
82	333	CONSALUS ROAD GOOSE CREEK SADDLE TO SQUAW VALLEY ROAD	T59N R5W, T34N R46E, T34N R45E	Hand Control	8.5	12.36	1.45	Weed corridor
83	2730	GREENHOOD ROAD FROM SQUAW VALLEY ROAD TO GOOSE CREEK SADDLE	T59N R5W, T34N R46E, T34N R45E	Hand Control	7.75	11.3	0.48	Weed corridor
84	461	TOLA ROAD 461 SYSTEM	T35N R45E S25,36	Hand Control	2.7	4.68	1.82	Weed corridor
85	1094, 1108	PELKE DIVIDE ROAD FROM SQUAW VALLEY ROAD TO CONSALUS ROAD	T59N R5W, T34N R46E, T34N R45E	Hand Control	11.1	15.23	4.55	Weed corridor
86	1107	UPPER WEST BRANCH ROAD	T35N R45E S 9,10,14,15,24	Hand Control	4	5.82	0.44	Weed corridor
88	1308, 1308H	COOKS ROAD SYSTEM	T59N R5W S 8,9,10,13,14,15,24	Hand Control	10.7	20.75	6.98	Weed corridor
90	2244	2244 ROAD SYSTEM	T59N R4W S 31, T59N R5W S 24,25,35,3	Hand Control	4.7	5.7	0.44	Weed corridor
91	461A, 461B, 461C, 461D, 2292, 2292B, 2292C, 2292F, 2292G	TOLA ROAD SYSTEM	T59N R5W, T60N R5W, T35N R46E, T35N R45E	Hand Control	12.8	19.1	2.74	Weed corridor
92	336, 336C, 336D, 336E, 336F	336 ROAD SYSTEM	T35N R45E S 11,12,13,14,24	Hand Control	11.3	16.43	1.56	Weed corridor
93	TRAIL 178	PEE WEE RIDGE TRAIL	T57N R4W S 18, T57N R5W S12,13	Hand Control/Biological		7	1	Recreation site
94	1314, 1314 SPURS 1335	QUARTZ MOUNTAND ROAD 1314 SYSTEM	T57N R5W S 3,4,9,10,11,14,15	Hand Control	36	69.81	9.16	Important wildlife habitats
95	416	QUARTZ CREEK ROAD	T57N R4W S7, T57N R5W S1,2,12, T58N R5W S 25,36	Hand Control	608	13.19	1.94	Important wildlife habitats
96		HIGHWAY 57 WITHIN THE LOWER WEST BRANCH DRAINAGE	T57N R5W, T58N R5W	Mowing/Biological	20	121.21	12.12	major weed corridor
97		HAMMOND RANCH MEADOWS	T58N R5W S 19,30	Hand Control		20	2.5	Prime rangelands
98		OLD CCC CAMP SITE OFF JOHNSON ROAD	T57N R5W S 8	Hand Control/Biological		15	10	Prime rangelands

ALTERNATIVE B

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	TREAT ACRES	CONTROL ACRES	RESOURCE CONCERNS
99		MEADOW ALONG HIGHWAY 57 AND MOORES CREEK	T58N R5W S27	Hand Control		10	1	Prime rangelands
100		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T57N R5W, T58N R5W, T58N R4W, T33N R45E, T33N R46E	Hand Control/Biological	60	290.91	6.06	Major weed corridor
101		TUNNEL CREEK MEADOWS IN SNOW VALLEY	T57N R6W S13	Hand Control		4	0.5	Prime rangelands
102		FOGGY BOTTOM WETLAND ALONG MOORES CREEK	T58N R5W S10	Biological		40	5	Unique habitats
103	318	BEAD LAKE ROAD FROM ROAD 305 TO DISTRICT BOUNDARY	T33N R45E S 21,22,23,24,28	Hand Control	7.7	11.2	0.73	Unique habitats
104	1312,1312A, 1312C, 2291A	ROAD 1312 AND 2291 ROAD SYSTEMS	T58N R5W S 8,9,16,17,20,21	Hand Control	12.1	20.09	0.85	Weed corridor
105	2250, 2250A	ROAD 2250 YSTEM	T58N R5W S 17,20	Hand Control	4.3	7.47	0.28	Weed corridor
106	1353, 1353A	ROAD 1353 SYSTEM	T33N R45E, T33N R46E, T34N R45E, T34N R46E	Hand Control	3.5	5.92	0.39	Weed corridor
108	1109	OJIBWAY RIDGE ROAD ALONG DISTRICT BOUNDARY	T33N R45E S8	Hand Control	0.9	1.31	0.02	Unique habitats
109	1042, 1042A, 1098A	MOORE-DUBIUS ROADS	T58N R5W S 3,4,5, T59N R5W S 32,33	Hand Control	10.3	14.97	0.32	Weed corridor
110	318F, 318G, 318H, 318J, 1092A, 1113	BEAD LAKE SPUR ROADS AND MOSQUITO POINT ROADS	T33N R45E S 22,23,24,25,26,27,28	Hand Control	11.6	16.87	3.03	Unique habitats
112	1041, 1041A, 1041B, 1041C, 1041E, 1041F, 1041H	ROAD 1041 SYSTEM	T58N R5W S 9,10	Hand Control	9.6	13.98	1.03	Weed corridor
113	2291, 2291B, 2291C, 2291D, 2291E, 2291F, 2291J	HAMMOND RANCH ROAD	T58N R5W S 20,28,29,30, T33N R46E S 18	Hand Control	8.2	13.67	1.45	Weed corridor, prime rangelands
114	1301	HIGHWAY 57 TO QUARTZ CREEK	T58N R5W S 33,34,35,36	Hand Control	4.7	4.6	0.55	Weed corridor
115	1334	PETERSON ROAD HIGHWAY 57 TO PENINSULA ROAD	T57N R5W S 14,15,23,24	Hand Control	4.5	10.91	0.97	Unique habitats, rangelands
117	1098	GLEASON BOSWELL ROAD	T33N R46E, T58N R5W, T59N R5W	Hand Control	11.7	17.46	1.14	Weed corridor
118	1084	OJIBWAY LOOP ROAD	T33N R45E S 10,11,13,14,15,22,23	Hand Control	6.4	10.86	1.45	Weed corridor
119		JOHNSON CUTOFF ROAD	T57N R5W S 5,8,17	Hand Control	2.5	6.1	1.1	Weed corridor
120	305	BEAR PAW ROAD TO DISTRICT BOUNDARY	T57N R5W, T58N R5W, T33N R 45E, T33N R46E, T34N R45E	Hand Control	18	29.09	5.82	Unique habitats
121		SCATTERED SITES ALONG LOWER PRIEST RIVER	T59N R4W S 19, T58N R4W S 5,6,8,21,33,34	Hand Control		40	5	Important wildlife habitats
122	334	McABEE FALLS ROAD 334 JUNCTION TO McABEE FALLS	T57N R4W, T58N R4W	Hand Control	10.7	12.97	0.97	Weed corridor
123	334	McABEE FALLS ROAD HIGHWAY 57 TO 334A JUNCTION	T58N R5W S 2,3,11,12	Hand Control	4	9.7	0.73	Weed corridor

ALTERNATIVE B

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	TREAT ACRES	CONTROL ACRES	RESOURCE CONCERNS
124	DICK	DICKENSHEET JUNCTION TO DICKENSHEET BRIDGE	T59N R4W S 19	Hand Control	1.2	4.36	0.44	Weed corridor
125	1116, 639N	BINARCH CREEK ROADS 639N AND 1116	T59N R5W S 10,11,12,13	Hand Control	3.6	4.05	0.46	Access to Research Natural Area
126	2423	BINARCH RIDGE ROAD	T60N R5W S 33,34	Hand Control	3.5	5.09	0.36	Weed corridor
128	639 AND TEMP ROADS	ROAD FROM LAMB CREEK OVER BINARCH MOUNTAIN TO HIGHWAY 57	T59N R5W, T60N R5W	Hand Control	23.7	53.28	6.35	Weed corridor
129	984	ROAD 984 FROM HIGHWAY 57 TO STONE JOHNNY	T57N R5W S 31,32,33,34,35,36	Hand Control		17.45	3.27	Important wildlife habitats

Alternative C: Manual, Cultural, Biological and Chemical Treatment

Alternative C describes the Proposed Action for management of noxious weeds on the Priest Lake Ranger District. It would also use a variety of treatments to control noxious weeds in accordance with the IPNF's Integrated Pest Management Philosophy. The primary difference between Alternative C and Alternative B is that Alternative C adds the use of chemicals (herbicides) to control noxious weeds. Projected cost to fully implement Alternative C over three years is $86,500.

Treatments would take place on a total of 2,636 acres which are infested by noxious weeds. Total treatment would be approximately 320 acres.

This alternative allows us to compare the cost and effectiveness of the chemical use with the potential environmental and health effects of this and other methods.

Under this alternative a full range of treatments would be considered for each site. Herbicide prescriptions would be consistent with or more restrictive than product label requirements. Non-compliance with label instructions is a violation of Federal law.

Herbicide Control The use of herbicides only would occur on 22 treatment sites covering 946 acres. Actual treatment is anticipated on 87 acres. Approved herbicides include Picloram, 2,4-D, Glyphosate, Dicamba, Clopyralid, Metsulfuron methyl, and Triclopyr. Chemicals would be applied with either backpack sprayers or pumper units mounted in the back of pickup trucks.

The application of herbicides would follow the general application guidelines outlined in Appendix B.

Herbicide and Manual Control This combination of noxious weed control would be used on 94 treatment sites encompassing 1464 acres. A total of 87 acres of noxious weeds would be treated. During the first year, infestations in this category, would be treated with an appropriate herbicide. Because it is anticipated that the first year of treatment would not completely eliminate the infestation, hand control would be used as a post-year treatment in most instances to finalize noxious weed control. The types of herbicides and methods of application would be the same as those under herbicides only method.

Herbicide and Biological Controls This combination of control method would be used on five treatment sites involving 93 acres. Actual treatment would total 38 acres. Herbicides would be used on the areas within the site that have the heaviest concentration of weeds. Biological agents would be used within portions of the site where herbicide application would be costly, time consuming and ineffective.

Manual and Biological Controls A combination of manual (pulling) and biological control would be used on four sites within the project area encompassing about 48 acres with approximately eight acres of weed concentrations.

Several biological agents would be used. They are listed below by the weed species they are known to treat.

Noxious Weed Species	Biological Control Agent(s)
knapweed	*Urophora affinis* (Banded gall fly), *Urophora quadrifasciatus* (UV knapweed seed head fly), *Metzeneria paucipunctella* (Spotted knapweed seed head moth), and *Cyphocleonus achates* (Knapweed root weevil).
St. Johnswort (goatweed)	*Chrysolina quadrigemina* (defoliating Klamath weed beetle).

tansy ragwort	*Longitarsus jacobaeae* (Ragwort flea beetle), and *Tyria jacobaeae* (cinnabar moth).
Canada thistle	*Ceutorhynchus litura* (Stem mining weevil) and *Urophora cardui* (gall fly)

Manual Control This single type of treatment would be used on four sites covering 43 acres, totalling about 1 acre of weed infestation. Weeds would be hand-pulled and disposed of as specified in the design criteria.

Biological Control Biological control is proposed on only one area, Foggy Bottom Wetland along Moores Creek. This infestation of St. Johnswort would be treated with the appropriate biological agent.

Cultural Control Cultural control as described in a previous section Methods and Practices Available for Noxious Weed Control and as specified in Features Common to All Alternatives would be applied on all treated acres.

Design Criteria Specific to Alternative C:

Noxious Weed Prevention and Control

1. If future development of herbicides results in products which promise to be more effective, their use would be evaluated.

2. All herbicide usage would comply with applicable laws and guidelines.

Public Safety

1. Treatment areas would be signed prior to and following herbicide applications within areas of special concern.

2. Application of herbicides to treat noxious weeds would be performed by or directly supervised by a state licensed applicator.

3. Procedures for mixing, loading and disposal of herbicides as outlined in Appendix "A" would be followed.

4. Procedures for a spill plan for hazardous materials as outlined in Appendix "A" would be followed.

5. The guidelines for safe application for individual herbicides as outlined on label requirements and also by State and Federal Laws would be followed.

6. All herbicide applications would be ground-based; there would not be any aerial application of herbicides.

7. Grazing allotment permittees would be notified in advance of treatments on their allotments and advised of the herbicide label requirements regarding management of livestock utilizing treated grazing lands.

Resource Protection

1. When spraying ditchlines carrying live water, weed free straw bales would be used in the ditchlines to filter water and thus prevent herbicides from reaching live stream channels.

2. Any application of pesticides would adhere to FSH 2509.22- Soil and Water Conservation Practices Handbook, 13.07-13.13.

3. Within 50 feet of known sensitive plant locations the preferred method of noxious weed control would be either manual or hand spray. No vehicle-based applications would occur. (Appendix B)

ALTERNATIVE C

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	INFESTATION ACRES	CONTROL ACRES	RESOURCE CONCERNS
1		SALMO PRIEST WILDERNESS AREA	T40N R46E, T39N R46E, T38N R46E	Herbicide/Hand Control		88 79	4 45	Wilderness, Research Natural Areas
2	1013	0 5 Mi E OF HUGHES FK TO CONTINENTAL GATE	T63N, R5W, T64N,R5W;T65N R5W	Herbicide/Hand Control	7 3	49 31	5 81	Major Corridor
3	1388	1388 ROAD BEHIND LIME CREEK GATE	T64N, R5W, SEC 1, 2, 12	Herbicide/Hand Control	4 5	6.55	0 24	Access to Roadless Area
4	2764	2764 ROAD SYSTEM	T64N, R5W, Sec 25, 26, 36	Herbicide/Hand Control	8 4	12 22	1 09	Unique Habitats
5	1014	BOULDER MEADOWS ROAD	T62N, R5W, Sec 3 and 4.	Hand Control		5 53	0.12	Unique Habitats
6	1327, 1327A, 1327C	1327 ROAD SYSTEM	T63N R5W S 10,14,15	Herbicide/Hand Control	4 9	7.12	2 04	Access to Scenic Area
7	656, 656A, 656C	656 ROAD SYSTEM	T38N R45E S 1,2,3 11,12,13 T63N R5W S 17,18	Herbicide/Hand Control	9 25	17 97	1.77	Access to Wilderness
8	1127, 1127A	HEMLOCK LOOP ROAD AND SPUR A	T38N R45E S 2,10,11,12,14	Herbicide/Hand Control	8 1	9 81	0 29	Access to Wilderness
9	1382, 1382A, 1382B, 1382C	1382 ROAD SYSTEM	T63N R5W 16,17,21	Herbicide/Hand Control	7 1	13 78	0.41	Access to Roadless Area
10	1343, 1343C	HUGHES ROAD TO CABINET PASS	T63N R5W S 4 9 T64N R5W S9,16,22 27,28,33 34	Herbicide/Hand Control	11 7	17 02	2 88	Access to Wilderness, Unique Habitats
11		LEDGE CREEK SALE UNITS	T63N R5W S 4,5,8,9,16,17	Herbicide/Hand Control		60	20	Major Weed Source Near Wilderness
12		GRAVEL PIT OFF ROAD 656	T63N R5W S17	Herbicide		7	3 5	Major Weed Source
13	1013	GRANITE PASS TO 0 5 Mi E OF HUGHES FK	T38N R45E S 11 T63N R5W S 9,10,16 17,19 20	Herbicide/Hand Control	12	6 58	0 37	Major Corridor
14	401, 401A, 401B, 1015	401 AND 1015 ROAD SYSTEM	T38N R45E S 13 T63N R5W S 19,20,21,28,29,33,34 T62N R5W S 2,3	Herbicide/Hand Control	14 47	29 46	0 73	Access to Roadless Areas
15	302	STATELINE TO GRANITE PASS	T62N R45E S 2,11 12 13 T38N R45E 24,25,26,35	Herbicide/Hand Control	7 1	17	1.07	Weed Corridor
16	302	NORDMAN TO STATELINE	T61N R5W S 2,3,11,12 T62N R5W S 28,29,30 33,34	Herbicide/Hand Control	6 9	16 94	1.07	Weed Corridor
17		HARVEST UNIT ALONG RD 302 W OF GRANITE PASS	T38N R45E S 13,24	Herbicide		25	15	Major Weed Source
18	302, 302B, 302C	GRANITE PASS TO PASS CREEK PASS	T38N R45E S 13 14,15 16,23	Herbicide/Hand Control	8 6	13 29	2.16	Major Corridor, Access to Wilderness
19	311	FROM RD 302 TO 308	T62N R5W, T37N R45E, T36N R45E	Hand Control	8 6	16 68	0.24	Access to Roadless, Unique Habitats
20	1122, 1122A, 1122B, 1122C 1122D, 1124 1124A, 1124B	1122 AND 1124 ROAD STYSTEM, AND KGB TEMP ROADS	T38N R45E S 15,16,17 21,22,28	Hand Control/Herbicide	32.39	54 36	3 68	Access to Roadless Area
21	1362	FROM RD 302 TO INDIAN MOUNTAIN / REEDER MOUNTAIN SADDLE	T61N R5W S5, T62N R5W S 32,33	Herbicide/Hand Control	6 5	15.76	1.21	Major Corridor
22	319, 1104	CACHE CK AND HARVEY GRANITE ROADS	T37N R45E S 14,20,21,22,23,27	Hand Control	13	18.91	0 29	Access to Roadless Areas
23	1341, 1341A	1341A AND 1341 ROADS FROM 302 TO BEAVER PASS	T62N R5W	Herbicide/Hand Control	6 9	15 34	3 49	Weed Corridor
24	1373	ROAD 1373 AND 1373A	T62N R5W S 9,10,15,16,21,22	Herbicide/Hand Control	6 8	8 24	0.48	Weed Corridor
25		GRAVEL PIT ALONG ROAD 638	T62N R5W S 24	Herbicide		5	1.5	Weed Source

ALTERNATIVE C

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	INFES-TATION ACRES	CONTROL ACRES	RESOURCE CONCERNS
26	1347, 1347A	MEDIA CK ROAD SYSTEM	T61N R5W, T61N R4W, T62N R5W, T62N R4W	Herbicide/Biological	8.4	16.29	0.78	Weed Corridor
27	1340, 1340A, 1340B, 1340C, 1340D, 1340E, 1340F	1340 ROAD SYSTEM	T61N R5W S1, T62N R5W S36	Herbicide/Hand Control	7.2	11.58	5.36	Weed Corridor
28	638	FROM ROAD 302 TO TANGO PASS	T62N R5W S24,25,26,27,34	Herbicide/Hand Control	5.4	10.47	1.21	Access to Roadless Area
29		TRAIL IN ROOSEVELT GROVE	T38N R45E S 23,26	Hand Control		2	0.25	Major Recreation Site
30	1341	FROM BEAVER CREEK CAMPGROUND TO BEAVER PASS	T62N R4W, T62N R5W	Herbicide/Hand Control	8.4	12.22	1.94	Access to Roadless Area
31		BEAVER CREEK RECREATION SITE	T62N R4W S9	Herbicide/Hand Control		0	0	Major Recreation Site
32	638	ROAD 2512 TO TANGO PASS	T62N R4W S 19,20,21,30 T62N R5W S 24	Herbicide/Hand Control	4	7.76	0.24	Access to Roadless Area
33		AIRSTRIP IN FRONT OF PRIEST LAKE RANGER STATION	T60N R5W S 2,11	Herbicide/Biological		50	25	Major Weed Source
34		HANNA PIT REFUSE SITE GRAVEL PIT	T60N R5W S 3	Herbicide		20	10	Major Weed Source
35		FROM NORDMAN TO MILE POST 30	T61N R5W, T60N R5W	Herbicide/Hand Control	4	24.24	2.42	
36		NORTHERN LIGHTS POWERLINE RIGHT OF WAY WITHIN KALISPELL CREEK DRAINAGE AND KGB TEMP ROADS WITHIN KALISPELL CREEK DRAINAGE	T60N R5W, T61N R5W	Herbicide	25	82.12	2.4	Major Weed Source
37	1338	KALISPELL BAY ROAD	T60N R5W S 11,12	Herbicide/Hand Control	1.5	5.45	0.73	Weed Corridor
38	1345	ROAD 1345 FROM HANNA FLATS ROAD TO LAMB CREEK ROAD	T60N R5W S9,16,21	Herbicide/Hand Control	4	5.82	1.45	Weed Corridor
39	502, 1355	ROAD 502 AND 1355	T60N R5W, T61N R5W	Herbicide/Hand Control	3	8.72	2.9	Weed Corridor
40	1362 & SPURS	ROAD 1362 FROM ROAD 308 TO REEDER MTN/INDIAN MTN SADDLE INCLUDING SPURS TO INDIAN MTN LOOKOUT	T61N R5W, T36N R46E, T37N R45E	Herbicide/Hand Control	16.5	35.16	2.37	Major Corridor
41		GRAVEL PIT ALONG ROAD 1362	T61N R5W S20	Herbicide		4	2	Major Weed Source
42	308	KALISPELL CK ROAD FROM HIGHWAY TO DISTRICT BOUNDARY	T61N R5W, T36N R45E	Herbicide/Hand Control	12.5	22.4	1.21	Access to Roadless Areas
43	337, 2119,2120	HUNGRY AND RAPID CREEK ROADS	T36N R45E	Herbicide/Hand Control	5.1	10.96	1.72	Access to Roadless Area, Unique Habitats
44	657, 657B, 657C, 1110, 1110A	DIAMOND PEAK ROADS	T36N R45E, T36N R46E, T61N R5W	Herbicide/Hand Control	11.9	22	3.45	Weed Corridor
45	1351	BATH CREEK ROAD AND SALE UNITS	T60N R5W S 5,6, T61N R5W S 29,32	Herbicide/Hand Control		60	10	Unique Habitats
46	1395	REYNOLDS CREEK ROAD SYSTEM	T60N R5W S 11,13,14,23	Herbicide/Hand Control	3.5	5.09	0.39	Weed Corridor
47		GRAVEL PIT OFF ROAD 308	T61N R5W S 34	Herbicide		4	2	Major Weed Source
48		OLD GRAVEL PIT AT KALISPELL BAY ROAD AND JUNCTION WITH HIGHWAY 57	T60N R5W S 11	Herbicide		15	14	Major Weed Source
49	308B	ROADS 308B &308C AS WELL AS OLD CCC	T36N R46E S19, T36N R45E S24	Herbicide/Hand Control	0.3	10.44	0.69	Unique Habitats

ALTERNATIVE C

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	INFES-TATION ACRES	CONTROL ACRES	RESOURCE CONCERNS
		CAMP MEADOW						
50		TRAIL TO KALISPELL ROCK	T36N R45E S 8,9,10	Herbicide/Hand Control	4	5.82	0.24	Recreation Site
51		PORTIONS OF BARTOO ISLAND	T60N R4W S 16,17,20			1	0.5	Recreation Site
52	313, 313A, 313B, 313D, 313E, 313F	ROAD 313 SYSTEM	T60N R5W, T61N R5W	Herbicide/Hand Control	12.55	17.11	2.12	Weed Corridor
53		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T61N R5W, T61N R4W	Herbicide	8	38.78	0.97	Weed Corridor
54	238	ROAD TO BISMARK WORK CENTER	T61N R5W S 23	Herbicide/Hand Control	1.4	3.39	0.39	Weed Corridor
55	1324, 1324A, 1324B	REEDER MOUNTAIN ROAD SYSTEM	T61N R5W S 4	Herbicide/Hand Control	3.8	5.53	0.33	Weed Corridor
56	1339	REEDER BAY ROAD NORDMAN TO GRANITE CREEK	T61N R5W S 23,24, T61N R4W S 16,17,19,20	Herbicide/Hand Control	4	14.55	2.18	Weed Corridor
57	2231	REEDER CREEK ROAD	T61N R5W S14,15,16,21	Herbicide/Hand Control	3	7.27	1.94	Weed Corridor
58		PORTIONS OF KALISPELL ISLAND	T60N R4W S8,9	Biological/Hand Contro	3 AC	3	1	Recreation Site
59	2512	LAKESHORE ROAD GRANITE CREEK TO BEAVER CREEK	T61N R4W, T62N R4W	Herbicide/Hand Control	7.8	15.13	0.73	Weed Corridor
60		NAVIGATION CAMPGROUND	T63N R4W S 19	Herbicide/Hand Control		5	1	Recreation Site
61	TRAIL 365	TRAIL 365 ELKINS TO KALISPELL BAY	T60N R4W S 6, T61N R4W S 19,30,31	Herbicide/Hand Control		3	0.5	Recreation Site
62	TRAIL	LAKESHORE TRAIL #294	T61N R4W, T62N R4W	Biological/hand Control	10	14.85	1.62	Recreation Site
63		KALISPELL BAY BOAT LAUNCH	T60N R5W S 12	Herbicide/Biological		5	1	Recreation Site
64	237	ROAD 237 OUTLET TO KALISPELL BAY	T59N R4W, T60N R4W, T60N R5W	Herbicide/Hand Control	8.8	12.8	0.24	
65	2249	DISTILLERY BAY TIMBER SALE ROAD SYSTEM	T 61N R4W S 5, T62N R4W S 29,30,31,32	Herbicide/Hand Control	4.5	6.55	0.73	Unique Habitats
66		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T60N R4W, T60N R5W	Herbicide	20	97.45	2.01	Major Weed Corridor
67		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T59N R4W, T59N R5W, T60N R4W, T60N R5W	Herbicide	5	24.24	0.61	Major Weed Corridor
68	57	HIGHWAY 57 WITHIN THE LAMB CREEK DRAINAGE	T60N, R5W, S 23, 26, 25, 36; T60N, R4W ; T59N R4W, T59N R4W, T60N R4W, T60N R5W	Herbicide	3	18.18	2.42	Major Weed Corridor
69	310	LAMB CREEK ROAD TO GLEASON MOUNTAIN	T60N R5W, T35N R46E, T35N R45E, T36N R45E	Herbicide/Hand Control	12	19.88	2.02	Weed Corridor
70	219	LAMB CREEK CONNECTION ROAD WITHIN LAMB CREEK DRAINAGE	T60N R5W	Herbicide/Hand Control	6.5	5.09	0.19	Weed Corridor
71	1048	WOODRAT MOUNTAIN ROAD HILLS TO OUTLET BAY	T59N R4W S 6, T60N R4W S 30,31, T60N R5W S 24,25	Herbicide/Hand Control	4.8	9.31	0.87	
72	659	SOLO CREEK ROAD	T34N R45E S 1,2,3,5,8,9,10	Herbicide/Hand Control	10.68			Weed Corridor
73		NORHTERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T58N R5W, T59N R5W, T59N R4W	Herbicide	15	72.73	2.42	Weed Corridor

ALTERNATIVE C

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	INFES-TATION ACRES	CONTROL ACRES	RESOURCE CONCERNS
74		CHIPMUNK RAPIDS SKI TRAILS	T59N R4W S 19,30,31, T59N R5W S 24,25	Herbicide/Hand Control		50	5	Recreation Site
75		GOOSE CREEK MEADOWS	T59N R5W S30	Herbicide	40 AC	40	2	Prime Rangelands
76		KANIKSU MARSH RNA	T59N R5W S25	Biological/Hand Control		30	5	Research Natural Area
77		MEADOW SOUTH OF 1075 BRIDGE ALONG UPPER WEST BRANCH	T35N R45E S 25	Herbicide	5	10	1	Prime Rangelands
78		MEADOW ALONG UPPER WEST BRANCH AND ROAD 312 JUST NORTH OF GREENHOOD ROAD JUNCTION	T59N R5W S 17	Herbicide	7	7	1.5	Prime Rangelands
79	57	HIGHWAY 57 WITHIN THE UPPER WEST BRANCH DRAINAGE	T58N R5W, T59N R4W, T59N R5W	Herbicide	5	30.3	2.42	Major Corridor
80	219	ROAD 219 WITHIN THE UPPER WEST BRANCH DRAINAGE	T35N R45E S 13,24	Herbicide/Hand Control	3	4.36	0.15	Weed Corridor
81	312	SQUAW VALLEY ROAD FROM HIGHWAY 57 TO PYRAMID PASS	T59N R5W, T34N R46E, T35N R45E	Herbicide/Hand Control	18.4	41.36	4	Weed Corridor
82	333	CONSALUS ROAD GOOSE CREEK SADDLE TO SQUAW VALLEY ROAD	T59N R5W, T34N R46E, T34N R45E	Herbicide/Hand Control	8.5	12.36	1.45	Weed Corridor
83	2730	GREENHOOD ROAD FROM SQUAW VALLEY ROAD TO GOOSE CREEK SADDLE	T59N R5W, T34N R46E, T34N R45E	Herbicide/Hand Control	7.75	11.3	0.48	Weed Corridor
84	461	TOLA ROAD 461 SYSTEM	T35N R45E S25,36	Herbicide/Hand Control	2.7	4.58	1.82	Weed Corridor
85	1094, 1108	PELKE DIVIDE ROAD FROM SQUAW VALLEY ROAD TO CONSALUS ROAD	T59N R5W, T34N R46E, T34N R45E	Herbicide/Hand Control	11.1	15.23	4.55	Weed Corridor
86	1107	UPPER WEST BRANCH ROAD	T35N R45E S 9,10,14,15,24	Herbicide/Hand Control	4	5.82	0.44	Weed Corridor
88	1308, 1308H	COOKS ROAD SYSTEM	T59N R5W S 8,9,10,13,14,15,24	Herbicide/Hand Control	10.7	20.75	6.98	Weed Corridor
90	2244	2244 ROAD SYSTEM	T59N R4W S 31, T59N R5W S 24,25,35,3	Herbicide/Hand Control	4.7	5.7	0.44	Weed Corridor
91	461A, 461B, 461C, 461D, 2292, 2292B, 2292C, 2292F, 2292G	TOLA ROAD SYSTEM	T59N R5W, T60N R5W, T35N R46E, T35N R45E	Herbicide/Hand Control	12.8	19.1	2.74	Weed Corridor
92	336, 336C, 336D, 336E, 336F	336 ROAD SYSTEM	T35N R45E S 11,12,13,14,24	Herbicide/Hand Control	11.3	16.43	1.56	Weed Corridor
93	TRAIL 178	PEE WEE RIDGE TRAIL	T57N R4W S 18, T57N R5W S12,13	Herbicide/Biological		7	1	Recreation Site
94	1314, 1314 SPURS 1335	QUARTZ MOUNTAND ROAD 1314 SYSTEM	T57N R5W S 3,4,9,10,11,14,15	Herbicide/Hand Control	36	69.81	9.16	Important Wildlife Habitats
95	416	QUARTZ CREEK ROAD	T57N R4W S7, T57N R5W S1,2,12, T58N R5W S 25,36	Herbicide/Hand Control	608	13.19	1.94	Important Wildlife Habitats
96		HIGHWAY 57 WITHIN THE LOWER WEST BRANCH DRAINAGE	T57N R5W, T58N R5W	Herbicide	20	121.21	12.12	Major Weed Corridor
97		HAMMOND RANCH MEADOWS	T58N R5W S 19,30	Herbicide		20	2.5	Prime Rangelands
98		OLD CCC CAMP SITE OFF JOHNSON ROAD	T57N R5W S 8	Herbicide/Biological		15	10	Prime Rangelands

ALTERNATIVE C

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	INFES-TATION ACRES	CONTROL ACRES	RESOURCE CONCERNS
99		MEADOW ALONG HIGHWAY 57 AND MOORES CREEK	T58N R5W S27	Herbicide		10	1	Prime Rangelands
100		NORTHERN LIGHTS POWERLINE CORRIDOR RIGHT OF WAY	T57N R5W, T58N R5W. T58N R4W, T33N R45E, T33N R46E	Herbicide	60	290.91	6.06	Major Weed Corridor
101		TUNNEL CREEK MEADOWS IN SNOW VALLEY	T57N R6W S13	Herbicide		4	0.5	Prime Rangelands
102		FOGGY BOTTOM WETLAND ALONG MOORES CREEK	T58N R5W S10	Biological		40	5	Unique Habitats
103	318	BEAD LAKE ROAD FROM ROAD 305 TO DISTRICT BOUNDARY	T33N R45E S 21,22,23,24,28	Herbicide/Hand Control	7.7	11.2	0.73	Unique Habitats
104	1312,1312A, 1312C, 2291A	ROAD 1312 AND 2291 ROAD SYSTEMS	T58N R5W S 8,9,16,17,20,21	Herbicide/Hand Control	12.1	20.09	0.85	Weed Corridor
105	2250. 2250A	ROAD 2250 YSTEM	T58N R5W S 17,20	Herbicide/Hand Control	4.3	7.47	0.28	Weed Corridor
106	1353, 1353A	ROAD 1353 SYSTEM	T33N R45E, T33N R46E, T34N R45E, T34N R46E	Herbicide/Hand Control	3.5	5.92	0.39	Weed Corridor
108	1109	OJIBWAY RIDGE ROAD ALONG DISTRICT BOUNDARY	T33N R45E S8	Herbicide/Hand Control	0.9	1.31	0.02	Unique Habitats
109	1042, 1042A, 1098A	MOORE-DUBIUS ROADS	T58N R5W S 3,4,5, T59N R5W S 32,33	Herbicide/Hand Control	10.3	14.97	0.32	Weed Corridor
110	318F, 318G, 318H, 318J, 1092A, 1113	BEAD LAKE SPUR ROADS AND MOSQUITO POINT ROADS	T33N R45E S 22,23,24.25,26.27,28	Herbicide/Hand Control	11.6	16.87	3.03	Unique Habitats
112	1041, 1041A, 1041B, 1041C, 1041E, 1041F, 1041H	ROAD 1041 SYSTEM	T58N R5W S 9,10	Herbicide/Hand Control	9.6	13.98	1.03	Weed Corridor
113	2291, 2291B, 2291C, 2291D, 2291E, 2291F, 2291J	HAMMOND RANCH ROAD	T58N R5W S 20,28,29,30, T33N R46E S 18	Herbicide/Hand Control	8.2	13.67	1.45	Weed Corridor, Prime Rangelands
114	1301	HIGHWAY 57 TO QUARTZ CREEK	T58N R5W S 33,34,35,36	Herbicide/Hand Control	4.7	4.6	0.55	Weed Corridor
115	1334	PETERSON ROAD HIGHWAY 57 TO PENINSULA ROAD	T57N R5W S 14,15,23,24	Herbicide/Hand Control	4.5	10.91	0.97	Unique Habitats, Rangelands
117	1098	GLEASON BOSWELL ROAD	T33N R46E, T58N R5W, T59N R5W	Herbicide/Hand Control	11.7	17.46	1.14	Weed Corridor
118	1084	OJIBWAY LOOP ROAD	T33N R45E S 10,11,13,14,15,22,23	Herbicide/Hand Control	6.4	10.86	1.45	Weed Corridor
119		JOHNSON CUTOFF ROAD	T57N R5W S 5,8,17	Herbicide/Hand Control	2.5	6.1	1.1	Weed Corridor
120	305	BEAR PAW ROAD TO DISTRICT BOUNDARY	T57N R5W, T58N R5W, T33N R 45E, T33N R46E, T34N R45E	Herbicide/Hand Control	18	29.09	5.82	Unique Habitats
121		SCATTERED SITES ALONG LOWER PRIEST RIVER	T59N R4W S 19, T58N R4W S 5,6,8,21,33,34	Herbicide/Hand Control		40	5	Important Wildlife Habitats
122	334	McABEE FALLS ROAD 334 JUNCTION TO McABEE FALLS	T57N R4W, T58N R4W	Herbicide/Hand Control	10.7	12.97	0.97	Weed Corridor

ALTERNATIVE C

SITE	ROAD NUMBER	LOCATION DESCRIPTION	LEGAL LOCATION	PROPOSED TREATMENT	ROAD LENGTH	INFES-TATION ACRES	CONTROL ACRES	RESOURCE CONCERNS
123	334	McABEE FALLS ROAD HIGHWAY 57 TO 334A JUNCTION	T58N R5W S 2,3,11,12	Herbicide/Hand Control	4	9.7	0.73	Weed Corridor
124	DICK	DICKENSHEET JUNCTION TO DICKENSHEET BRIDGE	T59N R4W S 19	Herbicide/Hand Control	1.2	4.36	0.44	Weed Corridor
125	1116, 639N	BINARCH CREEK ROADS 639N AND 1116	T59N R5W S 10,11,12,13	Herbicide/Hand Control	3.6	4.05	0.46	Access to Research Natural Area
126	2423	BINARCH RIDGE ROAD	T60N R5W S 33,34	Herbicide/Hand Control	3.5	5.09	0.36	Weed Corridor
128	639 AND TEMP ROADS	ROAD FROM LAMB CREEK OVER BINARCH MOUNTAIN TO HIGHWAY 57	T59N R5W, T60N R5W	Herbicide/Hand Control	23.7	53.28	6.35	Weed Corridor
129	984	ROAD 984 FROM HIGHWAY 57 TO STONE JOHNNY	T57N R5W S 31,32,33,34,35,36	Herbicide/Hand Control		17.45	3.27	Important Wildlife Habitats

Alternatives Considered But Not Given Detailed Study

Control with grazing

Grazing by sheep and goats provides another non-chemical alternative of control that may be applicable to large infestations of some noxious weed species. However, given the small, scattered nature of these infestation and their isolated locations, control through grazing becomes quite unfeasible. Grazing is relatively ineffective as a control technique on small infestations. Many plants would be skipped in these small or scattered infestations, thus requiring some followup treatment. Grazing can be used appropriately in areas with large infestations on commodity-production lands where some economic return can be gained on land that would otherwise be unproductive.

Control of Other Exotic Species

The Forest Service acknowledges that other exotic species exist within the Forest. Dominant species include: *Dactylis glomerata* (Orchard grass), *Phleum pratense* (Common timothy), *Poa pratensis* (Kentucky bluegrass) and *Trifolium spp.* (Clover). Many of these were intentionally introduced by seeding activities for erosion control. These species generally inhabit small areas. Under ideal circumstances these species would not be present in the Forest. Fortunately, these species are relatively non-aggressive and grazing by wild ungulates and domestic livestock has suppressed them. Eradication of these non-native species would require intensive soil disturbance practices frequently seen in farming communities across the West. The Forest Service will continue efforts to keep these species from spreading. These efforts include, for example, revegetating disturbed areas with appropriate native species to reduce the potential impact of non-native species when feasible.

Treatment Exclusively by Use of Herbicides

The interdisciplinary team also considered the exclusive use of herbicides for noxious weed control within all identified treatment areas. This alternative would not utilize control methods such as manual, cultural or biological treatments. This option was discounted early in the process of alternative formulation because an integrated approach to noxious weed treatment would be more suitable for the variety of noxious weed species and degrees of infestations within the project area.

Use of Aerial Application for Herbicides

Aerial application of herbicides, where feasible, was considered for treatment of noxious weeds in the project area. This method was dropped from further analysis for several reasons. Cost would have been excessive. Also, such application has an inherent variability in control of overspray as a result of wind drift. Aerial application of herbicides within road corridors would lead to increased safety concerns and difficulties.

Comparison of the Alternatives Considered in Detail

This table compares the alternatives by issue. More information on the issues is available on pages II-1 through II-3.

Table II-3 Comparison of Alternatives

Issue and Issue Indicator	Alt. A	Alt. B	Alt. C
Effects on Vegetation			
Number of Additional Acres Treated	0	320	320
Effects on Aquatic Resources			
Changes in volume of runoff	increase	no change	no change
Changes in sediment yield	increase	undetectible increase	undetectible increase
Are changes in fishery habitat within acceptable limits?	no change	yes	yes
Effects on Wildlife			
Changes in habitat for forage-dependent species:	long-term decrease	long-term increase	long-term increase at a faster rate than Alt B.
Effects on Social & Economic Factors			
Changes in Land Use Patterns (Opportunities for Cooperative Efforts)	No	Yes	Yes
Changes in Lifestyle	None	Loss of solitude during short times of implementation	Loss of solitude during short times of implementation
Changes in Agricultural Uses	Loss of useable acreage	Smaller loss of useable acreage	Least amount of change in useable acreage
Cost and Effectiveness of Weed Control Methods			
Cost of Implementation over 3-year period	$24,000	$1,130,000	$86,500
Predicted Effectiveness	VERY MINIMAL	28% effective	94% effective

Table II-3 Comparison of Alternatives (continued)

Issue and Issue Indicator	Alt. A	Alt. B	Alt. C
Potential Negative Effects on Human Health			
Effects on Weed Control Workers	limited skin or eye irritations	Same as Alt A plus slight risk of sprains, cuts, bruises, irritations	Insiginificantly small potential from herbicides. Other effects same as Alt A and Alt B.
Effects on Residents, Visitors	practically non-existent	Same as Alt A plus very slight risk of allergies to smoke or dust	Same as Alt B, risk from herbicides would be insignificantly small

Effects of the Spread of Noxious Weeds on the Physical, Biological, and Social Environment

Alternative A would have the greatest effect on vegetative diversity, with expanding populations of noxious weeds replacing native vegetation. Sensitive plant populations would be reduced in the future as weeds invade their habitats, and other unique botanical areas. Alternative B and C would reduce the impact of noxious weeds on other vegetation, with Alternative C having the greatest potential to maintain vegetative diversity in the long-term by being more effective in eradicating infestations. Sensitive plant populations would be most protected in Alternative C, though loss of individual plants may occur in either Alternative B or C.

As a result of the design of each of the alternatives, the effects to the physical resources such as soils and aquatics would not vary from one alternative to another to any measurable degree. Both Alternatives B and C would be within acceptable ranges for fisheries habitat. Manual, cultural, and biological treatments would have negligible effects on soil or aquatic resources. Without treatment, noxious weeds would indirectly result in a loss of native revegetation and would a limited effect on soil erosion and sediment delivery into streams. With project design for herbicide treatments in Alternative C, there is limited risk of any long-term effects. Chapter IV completes an in-depth analysis of effects to soils or aquatic resources by herbicide treatments.

For Alternative A, there would be a growing loss for forage production for many wildlife species because of the expanding infestations of noxious weeds. Negative impacts to other sensitive animal would also occur as a result of Alternative A. Alternative C would have the greatest likelihood of reducing the threats of long-term habitat loss to wildlife, rare plant, unique plant communities ,nd threatened species.

An analysis was also completed on the social environment. Alternative A would have the greatest impact on adjacent private or non-federal landowners because of the continued spread of noxious weeds onto their properties. Both Alternatives B and C would reduce existing populations, though Alternative C would have the greatest effect in reducing or eliminating populations for the long-term. Alternative C would also have the greatest benefit to grazing permittees on National Forest lands. In terms of lifestyles, Alternative A would have the indirect effect of spreading existing weed populations into new areas on clothing, recreational equipment, packstock, and vehicles; this effect would be greatly reduced in Alternative B, and especially in Alternative C. Both action alternatives would cause short-term disruptions to recreational activities during the periods of operations. Individuals would be displaced to other areas, or would avoid areas of herbicide application.

In terms of attitudes, there would continue to be conflicting attitudes toward noxious weed control efforts and methods. Alternative B would be supported by individuals who do not support the use of herbicides on National Forest lands. Conversely, Alternative C would be supported by individuals wanting a comprehensive treatment of noxious weeds because of the higher effectiveness and lower costs associated with herbicide treatments.

Existing Weed Infestations and Control Methods

Cost of Implementation

The cost for each of the proposed alternatives also varies considerably. Alternative A, which would be no departure from the existing program, would cost the least. Estimates for the implementation of this alternative over a three-year period are approximately $24,000, which mostly include KV collections to do treatment on past timber sales. Alternative B is the most expensive alternative proposed. Because of the labor-intensive nature of this alternative, it is estimated that this alternative will cost at a minimum of $1,130,000. Implementation of Alternative C is estimated as $86,500. Alternative C would require a limited workforce, therefore, reducing the overall cost of implementation.

Effectiveness of Treatment

The relative effectiveness of each alternative also varies. Alternative A, because of treatments would be concentrated within timber sale areas, where dollars generated from timber sale receipts would be used to finance post-sale control of existing noxious weed populations. Noxious weeds would not be eliminated or controlled on a large proportion of the district. This alternative would accept a philosophy that noxious weeds will become an element of this ecosystem.

Alternative B, would treat all the known infestations on the district but without the use of herbicides. Only manual, cultural and biological control methods would be used. This alternative, if fully financed, would be effective on an estimated 28 percent of the infestations by either eliminated or greatly reducing the population. Because of the extent of the noxious weed infestations at several locations, the majority of noxious weed populations would not be eliminated under this alternative. Moreover, manual control alone, even if supplemented with biological and cultural control methods, would be ineffective in eradicating certain species of weeds such as the hawkweeds, toadflax, or Canada thistle because of their rooting pattern. The likelihood of this alternative being fully financed is extremely low and unlikely. This high cost, when combined with the relative ineffectiveness of the proposed treatments on large weed populations, would make this alternative less likely to succeed than Alternative C in controlling noxious weeds within the project area.

Alternative C would be effective on most of the proposed treatment areas, with and estimated 94 percent of the infestations having the noxious weed population being eliminated or significantly reduced. The populations on the remaining sites would be controlled, though not eliminated. The effectiveness of Alternative C would prevent weeds from spreading to new locations on private lands or within the Priest Lake Ranger District.

Human Health

Effects on Project Workers

Alternative A would have little effect on project workers as only a very limited existing program would occur. These effects would be similar to the effects of Alternative B, in which the potential risks include a variety of sprains, cuts, or skin irritation to the individuals performing the work. Alternative B would require a large workforce so the potential for these effects would be high. To reduce the risk of any effect to human health with manual controls, gloves, long-sleeved shirts, and boots would be required.

The potential for similar injuries would occur in Alternative C to individuals performing hand-pulling as a control method. However, manual control would not require a large workforce for this alternative.

Alternative C would also use herbicide treatments. An analysis of risk to project workers was completed for the chemicals used in these treatments. The risk to workers involved in the handling and application of these herbicides is very low based on the criteria used for herbicide application on the District and the legal requirements regarding their handling and use. Workers would be required to use personal protective equipment; the use of this equipment is critical as most application exposure is dermal (i.e. skin), and not respiratory.

Effects on Residents, Visitors

Alternative A would have little effect on residents and visitors other than the inherent health risk of noxious weeds. Human reactions range from allergic reaction to skin irritation. While the potential does exist for severe reactions, the probability is very low. However, if noxious weed populations continue to grow as they would in Alternative A, these types of reactions would be expected to increase.

Alternative B also would have little effect. There may be an increased risk of allergy from the burning of hand-pulled weeds.

For Alternative C, the effects on human health for manual, cultural, and biological control would be the same as disclosed under Alternative B. This alternative also would include herbicide treatments, and several individuals responded to scoping about its effect on human health. The analysis included in Chapter IV concluded that the risk would be very low. As an example, a 150-pound person would have to consume 280 pounds of directly-sprayed huckleberries each day for a lifetime to reach the acceptable daily intake of 2,4-D. Moreover, spraying would be done outside areas normally used for picking of huckleberries, mushrooms, or other edible forest products. To ensure that individuals are aware of herbicide applications, treatment areas would be publicized annually and treatment areas signed. Other forest activities such as hiking would also created minimal, if any, risk to human health.

State and County

Opportunity for Cooperative Efforts with State and County Agencies

Both Alternatives B and C would provide opportunities for cooperation for the control of noxious weeds along Idaho Highway 57 and county roads within the project area. Alternative A would not include those opportunities.

Alternative A would not be consistent with the Forest Plan in complying with state and local laws governing noxious weed control. State laws and county ordinances require that all landowners are responsible for the control of noxious weeds on their lands.

Miles of Roadsides Treated and Cost of Treatments

The effects of the alternatives of spread of noxious weeds within the right-of-way on State and county roads would also differ. Alternative A, which would have essentially no treatment within the right-of-way of either State of county roads, would allow noxious weed population to spread unhampered within these areas and onto adjacent private lands. With no treatments, costs included by either the states of counties would not occur.

Both action alternatives would include treatments on National Forest lands along approximately 32 miles of Idaho Highway 57 right-of-way and along 55 miles of county road right-of-way in both Bonner and Pend Oreille Counties. Alternative B would attempt to control the spread of weeds along these rights-of-way, which contain the heaviest concentrations of weeds in the project area. Because of the relative ineffectiveness to eliminate such large populations with manual, biological, and cultural control methods and the high cost, the probability of success would be limited and weeds would continue to spread along these right-of-ways.

Costs would also be the highest for both the State and Counties in cooperation with the U.S. Forest Service. The estimated cost for cooperative work on these roads would be an estimated $50,500 extending over a three-year period.

Alternative C, would be the most effective in reducing the rate of spread of noxious weeds within the State and county right-of ways within the proposed project area. Noxious weed control along the Highway right-of-way would incorporate herbicide treatments, which are the most efficient and effective method to control large populations. The same mileage would be treated as for Alternative B. Costs would be much lower than Alternative B, with estimated costs being $16,000 to treat the rights-of-way over a three-year period.

CHAPTER III
Affected Environment

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Chapter III
The Affected Environment

Introduction

This chapter describes the current conditions of the physical, biological and human resources which could be affected by the proposed action. The discussion focuses on the features related to the issues identified during scoping and analysis of the project.

The resources are described as they relate to proposed methods to control noxious weeds. The discussion starts with a description of the physical environment of the Priest Lake Basin Ecosystem. It is followed by the existing noxious weed conditions on the Priest Lake Ranger District. Past treatment methods and the results of those activities are discussed. County and state weed control efforts are also described.

Other resource discussions cover Vegetational Community Diversity; Soils, Water Quality, and Fisheries, in a section titled Soils and Aquatic Resources; Wildlife and Human Resources and Human Health.

Priest Lake Basin Ecosystem

The project area is located entirely within the Priest Lake drainage in the Selkirk Mountain Ecosystem. The topography of the Selkirk Mountains lies in a generally north-south line. Elevations range from 2,400 feet at Priest Lake to near 6,500 feet within the Salmo-Priest Wilderness. Priest River flows out of Canada, bisecting the ecosystem into eastern and western halves. The Purcell Trench and Pend Oreille River form the southern boundary of the Priest Lake Basin.

Except for the tallest peaks, the region was covered by ice during previous episodes of glaciation. The latest glacial period ended 10,000 to 12,000 years ago. Alpine glaciers formed many cirques and basins at higher elevations. These are now often associated with small lakes and bogs.

The region is underlain with intrusive rocks associated with the Kaniksu Batholith. The bedrock is composed of coarse-grained, light-colored granite and granodiorite. Volcanic activity has deposited ash on the area several times since the last glaciation. On undisturbed sites, the ash layer is from 15 to 30 cm (6 to 12 inches) thick and up to 1 m (39 inches) thick locally. Due to wind and water action, deposition of volcanic material has been concentrated on north and northeast facing slopes. This distribution accentuates the differences in plant communities between north and south aspects.

Climate of this area is dominated by the Pacific maritime influence. Winters are characteristically relatively warm and wet. Summers are dry with occasional wet thunderstorms. Annual precipitation ranges from approximately 75 cm (20 inches) at lower elevations to over 250 cm (100 inches) at higher elevations. Most of the precipitation falls as snow between October and March.

Existing Weed Infestations and Control Methods

The noxious weed infestation on the Priest Lake Ranger District is rather extensive. Over 2600 acres are infested by weeds. The most prevalent species are spotted knapweed, meadow hawkweed, orange hawkweed, Dalmation toadflax, St. Johnswort, Canada thistle, common tansy and tansy ragwort. There are smaller populations of houndstongue, leafy spurge, diffuse knapweed, and scotch broom which have been detected. Control actions have been taken on these species.

Roads and trails serve as corridors for the dispersal of many noxious weed species. Noxious weed seeds and plant parts are moved along road systems by vehicles and people, allowing the establishment of noxious weeds into previously uninfested areas. Many of the road systems within the project area contain infestations of noxious weed species such as spotted knapweed, hawkweeds, and St. Johnswort. As corridors, road systems allow noxious weeds to invade into disturbed habitats such as areas where ground disturbance has taken place (i.e. previously harvested areas and gravelpits, etc.).

The dry communities such as those dominated by Douglas-fir, ponderosa pine, and meadowlands are inherently vulnerable to invasion by most noxious weed species such as spotted knapweed, St. Johnswort, and common tansy. Both meadow and orange hawkweeds are more common along the more moist habitats.

Several of the weed species of concern have been treated in the past using different treatment methods. Effectiveness of each treatment varies with different weed species. Along with the treatment, extensive surveying and inventorying of weed distribution and abundance has occurred.

An inventory of noxious weed on the district was begun in 1989 on a modest scale but developed into a significant effort starting in 1990. The inventory of the noxious weed infestations was focused throughout the district with an emphasis within high human-use areas, important wildlife and plant habitats and within past timber sale areas. Past timber sale areas were targeted because of the availability of funding. Locations of weed species were noted and all weeds found were hand-pulled, bagged, and burned. The majority of the surveys and control were concentrated along roadsides.

In 1990 more manual control, including hand-pulling, digging, or grubbing, was conducted, as well as monitoring the 1989 hand control efforts. Over the next several years the inventory and hand control continued. The majority of the road systems were mapped depicting noxious weed populations. Many sites had repeated manual control. Most of the control efforts were focused along roadsides in areas of smaller weed populations focusing on orange hawkweed, meadow hawkweed, and Dalmation toadflax.

After a few years of limited success, it was evident that the hand control efforts could not keep up with the rapidly invading weeds. Weeds were establishing in new areas at an alarming rate. Some patches of weeds were monitored over the course of several years to determine effectiveness of hand control.

As the weeds were spreading into new areas, the level of infestation soon became too large to treat using hand control across the entire district. Areas that were treated one year were found the next year with an exponential increase in the density and size of the patch. Often roads with very few individual weeds one year would have almost continuous patches of weeds one or two years later. Hand control was an option for many patches due to their small size; but, the number of small patches grew so large that only a small percentage of the patches could be treated due to time constraints.

In 1991 the first monitoring of manual control of hawkweed infestations was conducted; 33 patches were monitored that had been treated. In the case of meadow hawkweed, nearly 70% of the patches that were treated by hand control remained constant in size or increased significantly in size. The remaining 30% of the patches decreased in size or disappeared all together. However, 94% of these patches had less than 100 plants. Although the results are not completely conclusive, the monitoring does suggest that hand control of hawkweeds may only be effective on small populations where the number of plants within the population does not exceed 100 plants. Additional monitoring since that time has supported these initial results. Similar findings were noted for manual control methods on Dalmation toadflax.

In 1991 also, biological control was first initiated on the large population of spotted knapweed at the Priest Lake Airstrip. Biological agents including sead head moth and gall flies were introduced into this infestation. At this same time, a cultural control method using a grass seed mixture along with a chemical fertilizer was applied to the airstrip in an attempt to compete with the knapweed and reduce knapweed spread. Little effect to the knapweed population occurred, and the re-establishing of grass onto the airstrip failed because of the heavy knapweed infestation.

Biological control has also been been used on infestations of St.Johnswort on the District. The Klamath weed beetle was released in the Lamb Creek, Moore Creek and Dickensheet areas in 1993, 1994 and 1995.

The effectiveness of biological control efforts on the district are difficult to determine. Most of the biological control efforts to date have been done in recent years and have not resulted in significant control of the noxious weed populations. This is characteristic of biological control efforts because it takes many years for the population of the introduced insects to increase to levels that will permanently decrease the pest plant infestations.

Efforts to control noxious weeds with the use of herbicides were initiated in 1992. The knapweed infestation at the Priest Lake Airstrip was sprayed to control the population. Infestations of meadow hawkweed along the 302 Road in the Pass Creek area were also spot-sprayed to reduce the potential that noxious weeds would established within the Salmo-Priest Wilderness from this road system. Since that time, aA few other key areas were sprayed where hand control had proved ineffective; the spraying was successful in these areas. Since 1993, a total of 96.6 acres of noxious weed infestation have been treated by the use of herbicides under the guidelines of the IPNF Weed Pest Management Final EIS (1989). The herbicides which were used were Picloram/2,4-D and Glyphosate.

In 1995 and 1996 cursory monitoring of areas that were treated with herbicides showed a significant reduction in the population of the target weed species. Spotted knapweed infestations associated with the Priest Lake Airstrip have shown a significant decline after treatment with herbicides in 1992. Other areas, where a single treatment with herbicides has been applied, also show a significant reduction of knapweed or even the elimination of some populations as has occurred in infestations of meadow hawkweed. Second year follow-up treatments such as spot-spraying would further reduce or eliminate such populations. Cultural methods such as seeding ensures that noxious weeds can not re-invade easily into these treated areas. As an example, the grass-seeding of the Priest Lake Airstrip following the herbicide spraying has been very succesful...where in 1992, before spraying and seeding, the airstrip was a field of knapweed and now is a field of grass following an integrated program of herbicides and cultural treatment.

Today manual control on the Priest Lake Ranger District is limited due to the high costs associated with hand-pulling and its effectiveness on large populations. Inventory and monitoring continue, as does limited herbicide use and biological control. Biological control is used to slow down the rate of spread of some weeds such as St Johnswort and spotted knapweed.

In addition to efforts on federal lands, many individuals use a variety of methods to treat their private lands.

State and County Activities

The states of Idaho and Washington and Bonner and Boundary County, Idaho and Pend Oreille County, Washington have noxious weed control programs. The states of Idaho and Washington are responsible for overseeing and directing noxious weed activities. Each county has a noxious weed control board which is involved with noxious weed activities in a number of ways. The local weed control boards have the responsibilities to control weeds along county roads, provide information to and educate residents and other agencies about weed control methods, provide technical assistance with land management of private lands and assist in the training program.

Throughout the county the county weed control agencies actively spray herbicide along roads within their jurisdiction.
In addition to these, the boards also assist with the Certified Weed Free Hay program, assist with enforcement of the noxious weed control law and help with the identification of new weed invaders. All of this is accomplished through an integrated weed control management program. The counties use herbicide control, biological control, and provide some manual and cultural control using county crews, sub-contractors, and provide rental equipment for weed control to residents and other agencies.

Vegetational Community Diversity

The diversity of the vegetational community within the proposed project area varies from semi-dry to moist to wetland types. Dry communities with species such as ninebark, snowberry, ceanothus, ponderosa pine and Douglas-fir are generally found occupying southern exposures. Moist communities with species such as huckleberry, cedar, hemlock, spruce and subalpine fir are common throughout the project area. Wetland communities occupied by sedges and mosses are found within many valley bottoms.

The Selkirk and Priest River ecosystems contain 41 species of sensitive plants. Sensitive plants are those species, identified by the Regional Forester, whose population viability is determined to be a concern due to evidence of a significant current or predicted downward trend in population or habitat. On the Priest Lake Ranger District, the majority of sensitive plants are found in moist forest, riparian or wetland habitats.

No threatened or endangered plants, as listed under the Endangered Species Act, are known to occur on the Priest Lake District . However, water howellia, a threatened plant species, is suspected to occur within the Priest ecosystem. This species is found in seasonally flooded aquatic habitats.

Sensitive plants occur within or adjacent to 17 proposed treatment sites. Generally, these plants are outliers or "strays" from a larger population, and have become established in moist microsites along roads and trails. An exception to this is Kaniksu Marsh Research Natural Area (RNA), a diverse peatland containing 12 sensitive plant species. A list and map showing sensitive plant species and locations is included in the project file.

Peatlands are wetlands formed on peat soils, and include true bogs and fens. Peatlands typically are dominated by sphagnum moss and sedges, and may have areas of open water, floating mats of vegetation or raised peat (hummocks) that can support shrubs and trees. Valley peatlands, such as Kaniksu Marsh, are rare in Idaho and northeastern Washington. These occur in river valleys, usually around lakes or ponds. The Priest River ecosystem supports a number of significant peatlands, more than any other area in the state (Bursik and Moseley 1995). Flora and fauna are typical of boreal habitats found in the more northerly latitudes, and are adapted to the unique wetland conditions of the peatland. At least 20 sensitive plant species are found in peatlands. Bull thistle and canadian thistle, both noxious weeds, have invaded peatlands on the District. Two additional noxious weeds, orange and meadow hawkweed, would find this habitat suitable for colonization.

Soils and Aquatic Resources

Soils

Soils are an important part of the analysis because of the interaction of the soil characteristics and herbicides. Three soil characteristics of particular importance are the percent organic matter of the soil, the available water holding capacity of the soil, and the permeability of the soil. These three characteristics, plus the chemical properties of the herbicides, determine the availability of the herbicide or uptake by plants and its tendency to move through the soil.

When incorporated into the soil, part of the herbicide dissolves in the soil water and part absorbs onto soil particles, primarily organic matter and fine particles. The amount of herbicide adsorbed onto soil particles depends on the characteristics of the chemical and on the amount of organic matter and fine material in the soil. Any herbicide that remains in water is available for uptake by plant roots. However, if the water moves off site or out of the rooting zone it takes some of the dissolved herbicide with it.

As proposed in this EIS, the majority of the herbicide would be applied to the road prism. Soils within the road prism are generally devoid of organic matter, have low water holding capacity and generally restricted permeability rates. Herbicides applied to roads have a high risk of being carried off-site, either dissolved in water or absorbed onto soil particles. If these transported herbicides end up being directed off the road and onto the undisturbed forest floor, then, a very good soil situation exists for retaining the herbicide in the surface soils. If the transported herbicide is directed into ditches and streams, little to no filtration will take place.

Most undisturbed soils in North Idaho have a surface layer which ranges from 2 to 5 inches thick. The lower part of this litter layer is highly decomposed and would have a high capability of adsorbing herbicide. Below the organic litter layer is volcanic ash which occurs as the surface layer of mineral soil. The ash layer ranges from 7 to 16 inches in thickness. The top part of the ash is enriched in organic matter and the entire ash layer has a very high water holding capacity and herbicide-nutrient holding capacity. The risk of herbicide moving through undisturbed forest soils into the ground water is low in most places.

There are two basic categories of vegetation types associated with the project areas: Riparian areas and upland areas. There are only a few sites occupying riparian areas. The floodplains associated with these riparian sites are nearly level to gently sloping. High water tables are common near stream channels. As one moves away from the stream channels the chance of encountering a high water table diminishes.

Most of the sites are located in upland areas. These areas do not have the hydrologic regimes and resulting moisture to support the vegetation associated with riparian areas. While most of the proposed sites are located in upland areas, the locations of these sites are commonly along roads or trails, often leading to or draining into riparian areas.

Water Quality

The Priest Lake Ranger District is located within the larger Priest River drainage. The Priest River is a sixth order drainage flowing into the Pend Oreille River. The Priest River has its headwaters in British Columbia, flowing south across the Canadian-United States border into Idaho to its confluence with the Pend Oreille River, a length of 94 miles. Two lakes, Upper Priest Lake and Priest Lake, make up 22 miles of the river's course. Portions of the Priest River watershed are included in both the states of Idaho and Washington.

Special Designations:

The Priest River and associated tributaries have received special recognition from both the federal and state governments. The Idaho Department of Health and Welfare Rules and Regulations Title 1, Chapter 2 "Water Quality Standards and Waste Water Treatment Requirements" and Washington Administrative Code 173-201A identify the beneficial uses for rivers. The beneficial uses of Priest River include: domestic water supplies, agricultural water supply, cold water biota, and recreation.

The State of Idaho has listed portions of the Priest River and the following tributaries as Water Quality Limited Segments (WQLS): Binarch Creek, Kalispell Creek, Lamb Creek, Lower West Branch of the Priest River and Tango Creek. Site-specific BMPs have been developed, but do not deal with herbicide application. There are no similar stream listings for those streams on the Priest Lake Ranger District within the State of Washington.

Upper Priest River: The water quality of the Upper Priest River is excellent. The stream temperature is characteristically cold, stream-dissolved oxygen content is high, sediment and turbidity are very low. Limited access and low recreation use help to maintain the high quality water conditions in the upper reaches of the Priest River.

In 1987, the Idaho Panhandle National Forests recommended that the Federal Government designate the mainstem of the upper 18.5 miles of the river as a Wild and Scenic River. With this recommendation, the Forest Service adopted specific managerial prescriptions which would protect the outstanding resource values of the river corridor. The final designation of this water body as a Wild and Scenic River is unresolved. In addition to the Wild and Scenic River Designation, the Forest Service has also identified the Upper Priest River as critical habitat for bull trout, as such the entire drainage is a focal watershed.

Upper Priest Lake: Upper Priest Lake is an oligotrophic (nutrient poor) lake that is a little over 3.0 miles long and about 1 mile wide (1,350 surface acres). The lake is not accessible by road but is very popular for boaters and hikers. The current condition of the water quality within the lake is excellent. Upper Priest Lake is connected to the larger Priest Lake by a 2.7 mile long "river" called the Thorofare. The Thorofare flows both directions depending upon the season and thus it is more of a connective waterway than it is a river.

Priest Lake: The main Priest Lake is an oligotrophic (nutrient poor) lake that has very high water quality. Most of the lands surrounding Priest Lake are managed by the federal government or the State of Idaho. A relatively small portion of the watershed is owned by private interests. Priest Lake is an extremely popular recreation lake and is growing in popularity.

Hughes Fork: The Hughes Fork is the major tributary to Upper Priest River. The stream provides critical habitat for the bull trout. The watershed for Hughes Fork includes approximately 12,200 acres. Within Hughes Meadow, the stream was ditched for about 1.5 miles. The ditching efforts were completed during World War II, when the US Army Corp of Engineers created an emergency landing strip in the meadow. Since that time, the stream has attempted to reclaim the meadow; however, because of the depth of the ditch, the recovery of the stream has been quite slow. Plans are underway to accelerate the recovery of Hughes Fork within the meadow.

Granite Creek: Granite Creek is a fifth order drainage that includes approximately 63,000 acres and 172 miles of stream. The primary beneficial use in the drainage is fisheries, although in the lower reaches, there are domestic water rights associated with the private land holdings. The underlying geology is a mix of glaciated belts, glaciated granitics and glacial outwash. Granite Creek is a major tributary to Priest Lake. In summary, Granite Creek is a fairly stable stream that does have some problems with elevated sediment deposition and lack of incorporated large organic debris within the live stream channel.

Kalispell Creek: The Kalispell Creek drainage includes approximately, 25,000 acres; 21,000 acres are managed by USFS. The watershed is dominated by glaciated granitics and glacial outwash. Within the drainage, there are approximately 63 miles of stream. The primary beneficial use in the watershed is the fisheries. Within the mainstem of Kalispell Creek, there appears to be an abundance of sands moving through the system.

The State of Idaho, as well as private citizens, has recently shown an interest in the aquifer underlying the Kalispell Basin. Preliminary results from field reviews conducted by the USFS volunteers suggest that there are numerous recharge areas throughout the Kalispell Basin. The most obvious recharge areas are associated with the Diamond Creek/Nuisance Creek areas. Within these areas, the streams tend to flow subsurface and will resurface in fens, potholes and in short reaches of year-round streams.

Studies by the State of Idaho and the University of Idaho suggest that the aquifer underlying Kalispell Basin most likely extends far beyond the watershed boundaries. In fact, preliminary data suggests that as much as 200 feet of unconsolidated material underlies the basin and that the aquifer is one of the major water sources for Priest Lake. A university researcher (Kevin Freeman, 1994) states that the aquifer for Kalispell was very deep and very steep so that movement from the aquifer into the lake was rather rapid compared to a neighboring aquifer like Granite Creek.

Reeder Creek: Reeder Creek is a tributary to Priest Lake and is listed in the Forest Plan as an unscheduled drainage. It is listed by the State of Idaho as a Water Quality Limited Segment (WQLS). Because of these listings, extra caution is necessary when planning activities that could adversely impact the current conditions of Reeder Creek.

The total watershed area is approximately 9,200 acres. The foremost activities in the drainage are timber harvesting, followed by roading, grazing and home construction. The beneficial uses within the watershed include fisheries (primarily brook trout), cattle grazing, domestic water uses, agriculture and recreation. Reports from the 1980's suggest that cutthroat trout may exist in the headwaters, but no quantitative data exists to support this statement.

Binarch Creek: Binarch Creek is listed in the IPNF Forest Plan as an unscheduled drainage. It is listed as a WQLS by the United States Environmental Protection Agency and the Idaho Department of Environmental Quality. (Appendix C of the 1994 303 (D) list for the State of Idaho, Oct. 7, 1994, EPA, Region 10).

Binarch Creek is a second order stream draining approximately 7,000 acres. The stream flows through a glaciated valley with a relatively low gradient profile. Field reviews of the stream have documented that beaver dams are abundant throughout the watershed. The underlying geology of the Binarch drainage is granitics in the headwaters and belt rocks in the remainder of the drainage. Binarch Creek flows subsurface in the lower-middle reaches except during periods of heavy runoff associated with the annual spring runoff. According to field reviews of the stream, there are some reaches that are quite stable while others show elevated levels of sand deposition. The elevated sand deposition is attributed to past road construction, and failed beaver dams. Within the Binarch Creek drainage, beaver dams play a vital role in controlling/maintaining streamflows and sediment transport. The key beneficial use in this drainage is fisheries. There are no domestic water sources within this drainage.

Lamb Creek: This stream is listed as a WQLS by the EPA and is listed in the IPNF Forest Plan as an unscheduled drainage. The Lamb Creek drainage encompasses approximately 13,345 acres and discharges directly into the "outlet" for Priest Lake. The lower reaches of Lamb Creek are transporting a considerable amount of fines. These reaches have been impacted by home construction, road runoff, removal of large organic debris, and agriculture.

Upper West Branch: The Upper West Branch of the Priest River is a scheduled watershed in the IPNF Forest Plan. The Upper West Branch is a fifth order drainage, covering an estimated 44,000 acres. The underlying geology is predominantly granitics, although belt rocks are found in the lower elevations. Field reviews of this stream have documented that this stream is transporting a high level of sediment. Past road construction, timber harvesting, wildfires and cattle grazing have impacted the stream. The key beneficial uses within this drainage are fisheries, recreation, agriculture and domestic water use.

Lower West Branch: The Lower West Branch includes approximately 16,000 acres with a mixture of ownerships. Ranching and timber harvesting are the primary landuse activities in the basin. The lower reaches of the Lower West Branch have been significantly impacted by historical timber splash dam logging as well as roading and cattle grazing. The higher reaches of the watershed appear to be more stable than the lower reaches.

Lower Priest River: The Lower Priest River begins at the Outlet Dam on Priest Lake. Major streams flowing directly into the Lower Priest River include Binarch Creek, Upper West Branch, Murray Creek, Cottonwood Creek, East River, Benton Creek, Quartz Creek, Big Creek, Lower West Branch, Sanborn Creek and Saddler Creek. Prior to 1955, this river was used extensively to "drive" logs down to the timber mills in Priest River. The river appears to be lacking the large organic debris that is critical to meet channel morphology needs and fish habitat requirements. Overall, the river is in fair to poor shape from a physical habitat standpoint.

Beaver Creek: The Beaver Creek drainage includes approximately 6,560 acres and is almost exclusively public lands. Near the confluence of the creek with Priest Lake, there is a relatively small parcel of privately owned lands. The headwaters of the watershed are comprised of glaciated belt rocks with a overlayer of glacial till. Lower in the watershed, the underlying geology is weakly weathered granitics overlain by a glacial till which is a mix of both belt and granitic rocks. There is no recent stream data available for Beaver Creek.

Quartz Creek: The Quartz Creek basin includes approximately 7300 acres, including 1327 of private lands. The streams, within the watershed, flow through a complex transition zone of granitics, belt rocks and lacustrine deposits. The headwaters of Quartz Creek are composed primarily of moderately well to well weathered granitics.

At approximately the 2600 foot elevation, the channel begins flowing through ancient lake beds, also known as lacustrine plains. Streams in these lacustrine deposits are characterized by "shallow incised draws in wide valley bottoms" (IPNF Soil Rating Guide, updated 8/27/92). The stream substrate in the lacustrine deposits contain very little gravel or cobbles; instead they are dominated by silts and sands. The majority of the sands were produced by weathering of granite in upper parts of the watershed. The sands are underlain by the lacustrine deposits which are a fine-silty and coarse-silty matrix. These sediments are underlain by outwash or till.

The tributaries flowing into Quartz Creek below the 2550 elevation originate in hard weakly-weathered, metasedimentary, or belt rocks. At this point in time, it appears that the streams are attempting to transport elevated levels of sediment. The mainstem of Quartz Creek will not be stable until the roads adjacent to the creek are stabilized or removed.

Lakeface Drainages: Around the perimeter of the westside of Priest Lake, a number of small first and second order drainages feed into the lake. For the most part, these small streams are unnamed. The geology of the Priest Lake shoreline is primarily composed of ancient stream terraces and outwash plains underlain by metasedimentary or granitic rocks.

Pend Oreille River: Originating in Lake Pend Oreille, this river is a major tributary to the Columbia River. According to the USGS gauging stations, approximately 97 percent of the inflow to the Pend Oreille River and Lake upstream from Albeni Dam comes from the Clark Fork, Lightning Creek, Pack River, Rapid Lightening, Sand Creek and Priest River. The total drainage area of the Pend Oreille River (upstream of Albeni Dam) is approximately 15.5 million acres.

Domestic Water

Within the Priest Lake Basin, the majority of residences are clustered within one to two miles of the Lower Priest Lake. On the westside of Priest Lake the highest population densities are found in Outlet Bay, Luby Bay, Kalispell Bay, Reeder Bay, Granite Creek, Beaver Creek and Sandpiper Shores. Residents use a variety of sources for domestic water including lake water, groundwater and surface water.

Domestic water in the Granite/Reeder Bay Area, is currently supplied by individual domestic supply wells. In the Kalispell drainage, most water supply comes from individual wells and a few community wells service several homes. The domestic water for the Luby Bay area is obtained from individual domestic wells. The domestic water within the Osprey area is supplied by individual wells. For the residents of the Outlet Bay area, there are a few wells that supply smaller developments as well as some homes with individual wells. In the Beaver Creek/Sandpiper Shores area, there are two wells that service the Beaver Creek Camp Association and a USFS campground. Homes within Sandpiper Shores have individual wells.

Groundwater

Continental glaciation left extensive fluvial, lacustrine and morainal deposits overlying bedrock in the Priest Lake Basin. The deposits include mixes of gravels, sands, silts and clays. During glacial retreat, the lake covered a much larger area and deposited thick layers of fine grain material.

The depth and quality of the groundwater within the Priest Lake Basin is a function of the historical geology of the site. Daniel McHale studied the area for his 1995 Masters Thesis titled "Assessment of Shoreline Hydrogeology as Related to Water Disposal and Land Use Practices at Priest Lake, Bonner County, Idaho". In this report McHale identified specific "subareas" or study areas to focus his efforts on determining the vulnerability of aquifers to contamination. (Maps displaying the vulnerability of specific aquifers are located within the project file.)

General conclusions about the groundwater within the Priest Lake basin are:

1) Groundwater flows toward the lake in all areas except possibly at the southern end of the lake.
2) Residents rely on relatively shallow unconfined aquifers made up of coarse grained sediments for

water supply. These shallow aquifers are easily developed but highly vulnerable to impacts from land use practices.

3) The aquifers that are most vulnerable to contamination are in areas where the depth to water is from 0 to 25 feet below land surface.

Geology

The entire Priest River Basin lies within the Northern Rocky Mountain Geomorphic Province. Faulting is the major structural factor affecting the geology and drainage patterns. During the Pleistocene Era, a series of glaciers scoured the area after which time the glaciers receded and the river downcut in places through the glacial debris. The U-shaped valley, lakes and deposited materials along the valley bottom are remnant of this glacial action. Elevations range from 2,070 feet at the confluence with the Pend Oreille River to over 6,000 feet in various locations around the periphery of the drainage.

Fisheries

Species Management

USDA Forest Service Region One has identified two sensitive species that may be present on the Priest Lake Ranger District (USDA 1994). These fish are also considered Species of Special Concern by the State of Idaho. These species are:

- Bull Char, (*Salvelinus confluentus*)
- Westslope Cutthroat Trout, (*Oncorhynchus clarki lewisi*)

Bull Char - The bull trout is considered a Category C1 species under the Endangered Species Act (1973). The U.S. Fish and Wildlife Service decided on June 8, 1994 that the bull char was warranted but precluded from listing. On February 6, 1995 the USFWS changed the bull char status to warranted. This means significant threats exist to the continued existence of the species and the USFWS is in the process of drafting regulations.

Bull trout are found in cold water streams, rivers, and lakes. They spawn in late summer through fall (August to November), often in areas of ground water infiltration (USDA 1989). Fry hatch at the end of January and emerge in early spring (April). Juveniles remain near the stream bottom or in low velocity habitat (pools and pocketwater) for the first two years of their life. Unembedded substrate and dispersed woody debris are commonly used forms of cover. Most juveniles migrate at the beginning of the third growing season into larger lakes or rivers. Bull char usually mature at age 5 to 6. Adult migration begins in early spring (March or April) and may extend through the entire summer. Most fish are in spawning streams by August. Some adults will spawn more than once during their lifetime, but they may not spawn each year (Pratt 1992).

Existing Habitat Conditions - Bull trout are present in several of the drainages proposed for noxious weed control. Table III-1 lists those drainages where bull trout are present. Fluvial bull trout from Priest River and Priest Lake have been found in Binarch Creek (Pratt and Houston 1993). It is not known whether bull trout populations in the remaining streams are from resident or fluvial populations. The status of bull trout in the Priest River watershed is thought to be at a high risk of extinction (personal communication, Dave Cross, IPNF Fisheries Biologist, 1995)

Westslope Cutthroat Trout - Westslope cutthroat trout occur in clear, cool streams usually with water temperatures less than 17 degrees Celsius. Cutthroat habitat contains rocky, silt-free riffles, for spawning and slow, deep pools with well vegetated stream banks for feeding and resting (USDA 1989). They tend to occupy headwater areas especially when other salmonid species are present in the same stream (Hickman and Raleigh 1982). Cutthroat trout usually reach sexual maturity at age 3 to 4. They spawn in the spring, usually in April or May. Fry and juveniles occur in stream sections that are shallow with slow velocity flows.

As fish grow larger and mature, they seek out deep water habitat types such as pools and deep runs (Hickman and Raleigh 1982; Baltz et al. 1991). During winter, cutthroat trout typically seek deeper water associated with large woody debris (Moore and Gregory 1988). Strong populations of this species exist in only 36% of its original range in Idaho (Rieman and Apperman, 1989).

Existing Habitat Conditions - Westslope cutthroat trout are present in most drainages of the Priest River watershed. Table III-1 lists those drainages where westslope cutthroat are present and noxious weed control is proposed. In drainages where introduced rainbow and brook trout occur, long term viability of westslope cutthroat may be in question (personal communications Dave Cross, IPNF Fisheries Biologist, 1995). In many cases this may not be due to solely introduced species. Instead, cumulative effects from fishing pressure, introduced species, and a depressed cutthroat population from managed disturbances have all played a part to tip the balance against cutthroat.

Other Species - In addition to the bull trout and westslope cutthroat trout, tributaries of Priest Lake and Priest River support sculpins (*Cottus*), slimy sculpins (*Cottus cognatus*), longnose dace (*Rhinichthys cataractae*), pygmy whitefish (*Prosopium coulteri*), mountain whitefish (*Prosopium williamsoni*), kokanee salmon (*Oncorhynchus nerka*), rainbow trout (*Oncorhynchus mykiss*), Northern squawfish (*Ptychocheilus oregonensis*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), yellow perch (*Perca flavescens*), crappie (*Pomoxis*), lake trout (*Salvelinus namaycush*), brown trout (*Salvelinus trutta*) and brook trout (*Salvelinus fontinalis*).

Table III-1 Fish Occupancy by Drainage

Drainage	Westslope cutthroat trout	Bull trout
Athol Creek	Yes	No
Bath Creek	Yes	No
Beaver Creek	Yes	No
Binarch Creek	Yes	No
Blacktail Creek	Yes	Yes
Boulder Creek	Yes	Yes
Cache Creek	Yes	Yes
Chute Creek	Yes	No
Colza Creek	Yes	No
Consalus Creek	Yes	No
Fedar Creek	Yes	No
Gold Creek	Yes	Yes
Granite Creek	Yes	Yes
Hughes Creek	Yes	Yes
Jackson Creek	Yes	Yes
Jost Creek	Yes	No
Kalispell Creek	Yes	No
Lime Creek	Yes	Yes
Muskegon Creek	Yes	Yes
N. Fork Granite Creek	Yes	Yes
Packer Creek	Yes	Yes
Priest Lake	Yes	Yes
Rapids Creek	Yes	No
Reeder Creek	Yes	No
Ruby Creek	Yes	Yes
Sema Creek	Yes	No
S. Fork Gold Creek	Yes	Yes
S. Fork Granite Creek	Yes	Yes
Tango Creek	Yes	No
Upper Priest River	Yes	Yes

Table III-2 Drainages Not Occupied

Drainage	Westslope cutthroat trout	Bull trout
Bearpaw Creek	No	No
Blanc Creek	No	No
Continental Creek	No	No
Dusty Creek	No	No
Flat Creek	No	No
Goose Creek	No	No
Hemlock Creek	No	No
Hickman Creek	No	No
Kavanaugh Creek	No	No
Moores Creek	No	No
Mush Creek	No	No
N. Fork Goose Creek	No	No
Pine Creek	No	No
Puzzle Creek	No	No
Quartz Creek	No	No
Reynolds Creek	No	No
Rogers Creek	No	No
Snow Creek	No	No
Solo Creek	No	No
Steep Creek	No	No
Tola Creek	No	No
Tunnel Creek	No	No
Upper W. Branch	No	No
W. Fork Moores Creek	No	No
W. Fork Packer Creek	No	No
Willow Creek	No	No

Table III-3 Drainages with Unknown Occupancy Status

Drainage	Westslope cutthroat trout	Bull trout
Bottle Creek	Unknown	Unknown
Cottonwood Creek	Unknown	Unknown
Deerhorn Creek	Unknown	Unknown
Diamond Creek	Unknown	Unknown
Dubius Creek	Unknown	Unknown
Guinn Creek	Unknown	Unknown
Hazard Creek	Unknown	Unknown
Hammond Creek	Unknown	Unknown
Indian Creek	Unknown	Unknown
Lamb Creek	Unknown	Unknown
Lamb Creek	Unknown	Unknown
Lunar Creek	Unknown	Unknown
Murray Creek	Unknown	Unknown
Nuisance Creek	Unknown	Unknown
Paqua Creek	Unknown	Unknown
Pee Wee Creek	Unknown	Unknown
Sockwa Creek	Unknown	Unknown
Tee Pee Creek	Unknown	Unknown

Information provided in these tables was compiled from North Zone fisheries surveys conducted between 1982 and 1995.

Wildlife

Several threatened and endangered animal species may occur or have suitable habitat in the project areas. These are the grizzly bear, the woodland caribou, the northern rocky mountain wolf and the bald eagle. Further information on these species can be found in the Biological Assessment.

Treatment areas include the recovery zones for the Selkirk Mountain Grizzly Bear and Woodland Caribou. The entire district is identified as occupied gray wolf habitat. No areas have been identified as recovery habitat for gray wolves. The entire district is within the generalized recovery zone for bald eagle. Areas in the Upper Priest River drainage and lower Priest River are extremely important for nesting.

There are many other species of wildlife that are designated as sensitive by the Northern Region Regional Forester. Nine species are known to be present or their habitat occurs near treatment areas. They are as follows: common loon, harlequin duck, boreal owl, flammulated owl, black-backed woodpecker, lynx, fisher, wolverine and northern bog lemming. Further information on these species is present in the Biological Assessment.

The Priest Lake Ranger District has four species that are used as management indicator species. These are the pileated woodpecker, northern goshawk, pine marten and white-tailed deer. These species vary in abundance from uncommon (northern goshawk) to more common white-tailed deer.

Pileated woodpecker, goshawk and pine marten prefer older timbered stands and white-tailed deer prefer a mixture of timbered stands with some openings.

Other species of concern include a diverse group commonly referred to as neotropical migrant birds. These birds typically are small songbirds that migrate from northern breeding grounds to the neotropics for the winter, but as a management group also includes resident birds as chickadees. Many of these birds are insectivorous, but some are granivorous. Their habitat requirements vary from almost rocky slopes (rock wrens), to meadows and lower seral stages (chipping sparrows), to densely timbered old growth stands (winter wrens). Around 150 species occur within the elevational gradient within the treatment areas.

Human Resources and Human Health

The impact of noxious weeds on human resources and human health is addressed by both tangible and intangible effects. Some of these impacts are perceptions of individuals and some are impacts that pose a real threat to individuals or their livelihood.

For the most part the existence of noxious weeds does not pose significant health threats to a large portion of the population. However, many individuals are affected by allergies and minor skin irritations from the weeds. For example, leafy spurge contains a latex-bearing sap which seriously irritates human skin and can cause blindness in humans upon contact with the eye (Callihan et al, 1991). Some species of weeds, such as the thistles, cause minor scrapes and irritations.

The spread of noxious weeds has intensified in recent years in the Northwest and many people have needed to conduct some sort of control method. The hand pulling of weeds can cause minor skin irritations and potential minor injuries from tripping. The exposure to any herbicide treatments that might be used also may result in a reaction from some people. The potential of an illness or accident occurring from the exposure to a weed control treatment is low, but the possibility exists. This potential for an effect varies from person to person.

Economic Setting

Employment

Employment in Pend Oreille County, Washington; and Bonner and Boundary Counties in Idaho revolves heavily on logging and lumber manufacturing, tourism, and agriculture industries. The three counties have experienced high rates of unemployment throughout most of the last two decades. In the 1970's, unemployment remained relatively high due to the large number of people moving into the area. People were attracted by its scenic beauty, recreational opportunities, and quality of life (personal communication, Tacke). In the early 1980's, the main industry, lumber and wood products, experienced many difficulties, pushing the unemployment rate upward.

Since 1990, the unemployment rate has risen for several reasons. There have been layoffs or closures at lumber mills and other manufacturing companies. Also, the renewal of rapid population growth has outpaced employment growth (ibid). Characteristically, the unemployment rate is higher than state and national figures. In 1995, the unemployment rate was between 8 and 9 percent for the three counties while the national average was 5.6 percent (ibid). Jobs that are being added tend to be lower-paying retail and service jobs, rather than in manufacturing and other higher-paying sectors.

Timber Industry

The timber industry historically has been a mainstay of the three-county area. Analysis conducted for the Forest Plan indicates employment and income are directly related to the supply of timber ultimately available to local mills. The communities of Priest River and Newport largely have been timber-dependent communities in the past with a high majority of residents employed in logging or sawmill operations. A large percentage of the harvested timber was removed historically from Forest Service lands on the Priest Lake Ranger District. However, there has been a declining volume of timber sales offered on federal lands the past few years.

Areas disturbed by logging operations such as new roads, landings, and skidtrails provide ideal conditions for the spread of noxious weeds from existing populations. Currently, dollars are collected under the Knutson-Vandenburg Act (KV) for post-sale treatment of noxious weeds and revegetation of disturbed sites with grasses or native vegetation.

Agriculture and Grazing Industries

Livestock grazing also is an important segment of the economy of the Priest Lake Basin. Seven National Forest cattle-grazing provide 1416 animal unit months. These allotments are scattered on the southern portion of the district. Additionally, there are a number of private lands located through the lower half of the District that are used for livestock-grazing and hay production.

Noxious weeds have spread from road systems into these pasture areas and fields or were introduced from other areas through weed-infested hay or by animals and birds. The presence of species such as spotted knapweed, orange hawkweed, meadow hawkweed, and tansy has been increasing on range lands over the past decade, resulting in reduced range productivity. Hay and seed producers deal with reduced desirable yields because of noxious weeds, and risk losing their valued weed-free status. Some species of noxious weeds, such as houndstongue, contain toxic elements which cause liver cells to stop reproducing in horses, cattle, and, to a lesser extent, sheep (Whitson, et al., 1992). Several private landowners have treated their lands for noxious weeds with herbicide, biological, manual, and cultural control methods.

The presence of noxious weeds can reduce the real estate value of agricultural lands. As an example, in North Dakota, mortgage companies will not lend on agricultural property infested with leafy spurge (King, p.12). In Idaho or Washington, this currently is not the case. However, the value of agricultural lands is affected by the intensity of noxious weed infestations.

Tourism Industry

The tourism industry has grown with the expanding population in the area and increased development of facilities and access. Northern Idaho and northeastern Washington in general, and Priest Lake in specific, have been recognized regionally, and nationally, for their special qualities. These areas are valued for their scenic beauty, the major lakes of the region, and an array of recreational opportunities.

The spread of noxious weeds has affected the tourism industry indirectly by changing the scenic character of the landscape. Over the past 20 to 30 years, noxious weeds have spread through the Priest Lake Ranger District along Highway 57 and most of the road systems on the ranger district. Recreationists have been responsible for spreading noxious weeds along trail systems, in campgrounds, at dispersed campsites along the shores of Priest Lake and the islands. This has happened as seeds are transported on vehicles, motorbikes or mountain bikes, boats, feed for packstock, and on clothing. This spread of noxious weeds has resulted in a gradual change of the visual landscape as the invader weeds have replaced native revegetation at these locations. However, there has been limited economic loss to tourism industry directly attributable to noxious weeds.

Social Setting

Lifestyles

A 1995 survey collected data on the recreation and tourism use of the Priest Lake Basin. This study, conducted by the University of Idaho Department of Resource Recreation and Tourism, was supported by various local organizations, residents, state and federal agencies including the Forest Service. The survey screened all traffic entering the Priest Lake Basin on Highway 57 from June 1 through September 9, 1995. The survey provided valuable data on travelers, including recreationists and tourists, in the basin.

Three broad categories of people use the Priest Lake Basin: 1) permanent residents, 2) seasonal residents, and 3) non-resident recreationists. In the draft report of the 1995 survey, 16 percent of the travelers identified that they were permanent residents of the Priest Lake area; 84 percent were non-residents. Of the non-resident overnight travelers, 17 percent stayed at their second homes, 12 percent on their cabin leased from the State, and 5 percent at cabins on land leased from the Forest Service. The remaining two-thirds of non-resident travelers were mostly recreationists and visitors.

Permanent residents include those individuals and families living yearlong within the Priest Lake Basin north of the community of Priest River. The population of permanent residents living within the basin is estimated to be several hundred with approximately 500-600 living on private lands within the boundaries of the project area. Local residents pursue a wide variety of lifestyles, but many share a common orientation to the outdoors and natural resources. This is reflected in both vocational and recreational pursuits. Employment within the Priest Lake Basin includes logging and milling operations; outfitter/guide services; service industries including marinas, resorts, and restaurants; government agencies; ranching; and retail establishments.

The local permanent residents and Priest River/Newport residents use National Forest lands on the Priest Lake Ranger District for firewood-gathering; hunting; fishing; picking huckleberries, mushrooms, and other forest products; boating; hiking; horseback riding; snowmobiling; and other activities.

During the summer months, the population of the Priest Lake Basin at least doubles or triples with the influx of seasonal residents, who own or rent second homes, or are seasonally employed. The majority of these seasonal residents are from Spokane with other areas of eastern Washington also well-represented. Housing is located on both private and on state-leased or federal-leased land. On the Priest Lake Ranger District, there are 121 recreation residences. Many of the seasonal residents are retired, and spend the summer months at Priest Lake returning to their permanent homes or to warmer climates in the colder months.

For the seasonal residents, the focus of activity is primarily Priest Lake for water-based recreation. Activities such as pleasure-driving, wood gathering, huckleberry-picking or mushroom-gathering are all common activities. Community facilities such as Priest Lake golf course and museum are also popular.

The greatest number of non-resident recreationists using the Priest Lake area are from Spokane County, Washington. The 1995 survey indicated that 43 percent of all travelers were Spokane County residents with another 7 percent from adjacent Kootenai County, Idaho (Coeur d'Alene). Three percent of the respondents were from King County, Washington (Seattle).

For recreationists, the overwhelming attraction to the area is Priest Lake including its islands. The survey indicated that 36 percent of the use by interviewed recreationists was lake-based with an additional 27 percent island-based. Motor-boating was the most often-mentioned activity for all recreationists. The remaining summer recreation use was road-based (26 percent) which included such activities as scenic driving, huckleberry-picking, and camping and backcountry/stream-based accounting for 11 percent of users. Viewing natural scenery was the most highly rated opportunity of recreation experiences in the interview.

Recreation use has been growing during the fall and winter (from September 15 to Memorial Day). Between 50-60 percent of the interviewed recreationists used the Priest Lake Basin during these months. Hunting was mentioned by 23 percent of the interviews. During the winter months, snowmobiling (34 percent) and cross-country skiing (21 percent) were the major activities.

Total recreation visitor days was estimated to be 1,629,000. Highest use was concentrated in the southern portion of Priest Lake. Only 4 percent identified that they would be recreating in the largely unroaded northern portion of the Priest Lake District.

Recreation use has been one of the primary sources for the spread of noxious weeds. Because of their rapid ability to spread by seed, noxious weeds have been introduced into previously weed-free environments by motor vehicles, trailbikes, or mountainbikes and by people; seeds are attached to the equipment or an individual's clothing. Animals, such as horses or packstock and dogs, also transport noxious weed seed. There are patches of noxious weeds lining several of the trail systems on the District, including those trails in the Salmo-Priest Wilderness. Boaters have introduced weeds to the islands and Upper Priest Lake. The heaviest infestations of weeds are associated with the most heavily-used recreation areas such as developed campgrounds, trailheads, dispersed recreation areas, and along the major system roads which receive the heaviest recreation use.

Land-Use Patterns

There are 196,000 acres within the Priest Lake Ranger District within the boundaries of Bonner County including 165,000 acres of National Forest lands and 31,000 of private lands; 39,000 acres in Boundary County with 39,000 acres of National Forest lands and 100 acres of private lands; and 125,000 acres of Pend Oreille County with 119,000 acres of National Forest lands and 6000 acres of private lands.

The primary residential areas adjacent to Priest Lake Ranger District include the lands surrounding Bismark Meadows, lower Granite Creek, the Lamb Creek area, Quartz Creek, along the Gleason-McAbee Falls Road, and the Lower and Upper West Branch drainages. Some of these lands are also managed for livestock-grazing and hay production.

Noxious weeds have invaded private lands within the boundaries of the Priest Lake Ranger District. This spread largely has occurred from existing road systems or was introduced by equipment, animals or humans, or by weed-infested hay. Several private landowners individually have treated their lands through a variety of methods; the landowners who raise livestock or hay especially have been active in reducing noxious weeds on their properties. Control of these weeds is costly and much valuable time may be spent by individuals to stay ahead of the encroaching weeds. Requests have been made to the Forest Service from some landowners that noxious weeds be controlled on National Forest lands in the vicinity of their private lands.

On National Forest lands, there are a large number of special uses, rights-of-way, or easements which have been granted to state and county agencies, utilities, or private landowners. Easements have been granted to the State of Idaho and Bonner County respectively for State Highway 57 and various county roads. Rights-of-way have been issued for powerline, telephone line, and other utility corridors. There are also a number of Special Use Permits including road permits to private landowners, water transmission lines, pasture permits, and other appropriate uses. There also are approximately 100 recreation residence permits on National Forest lands along the lakeshore and several commercial leases. Because of the ground-disturbing activities associated with road rights-of-way or easements, utility corridors, and other Special Use Permits, these areas have high infestations of noxious weeds.

Attitudes, Beliefs, and Values

The effects of management activities have the potential to ripple throughout a wide cross-section of the local communities. Timber, tourism, and agricultural industries are the mainstays of north Idaho and northeastern Washington. Economic analysis of these areas reveals a heavy dependence on natural resources. Despite a common concern for the dependence on natural resources, social attitudes differ sharply with respect to resource management activities of the Forest Service. Residents and forest users offer a broad spectrum of perspective on Forest Service land management ranging from preservation to maximum development and utilization of natural resources. With the influx of new residents from other areas of the country, concern over social amenity values on National Forest lands has grown in regards to water quality, protection of wildlife and fishery values, and maintenance of high scenic quality. Regionally and nationally, there also is increased awareness and concern over amenity values.

As stated above noxious weeds have rapidly spread throughout North America. The spread can primarily be attributed to human caused dispersal such as vehicles and roads, contaminated livestock feed, contaminated seed, and poor revegetation practices of disturbed lands. This spread is a human resource issue as past management practices of individuals and government agencies have exacerbated the spread of noxious weeds. For many resident and non-resident recreationists, the presence of noxious weeds is evidence of negative human impact and negligence in stewardship of natural resources. These people have a strong emotional response to the prospect of noxious weeds in the National Forest and the possibility of increased spread affecting their enjoyment of the forest resources.

Noxious weeds have an impact to others besides those that are affected economically. Forest visitors can have the aesthetic quality of their experience detracted from due to large expanses of unsightly noxious weed populations. Several comments in response to the scoping notice dealt with people noticing noxious weeds spreading on the District during the past several years and this was detracting from their perception of beauty of the area. There is also a concern of losing wildlife habitat to invading noxious weeds which may reduce the intrinsic value of an area for some people. Some species of weeds such as the thistles cause minor scrapes and irritations when people must walk through them during their recreational experience.

Visitors and users of the Forest have commented on how fast some species of weeds are spreading in areas that they use. Over the past 20-30 years, noxious weeds have become established in scattered locations across the Priest Lake Ranger District from the Salmo-Priest Wilderness on the north to the southern boundary. Because of this spread, many individuals have now learned to understand the effects and to identify the various species where a few years ago they were unknown. However, there remains varying levels of knowledge and perceptions about noxious weeds and their effects. Attracted by their flowers, some recreationists have picked bouquets of hawkweed and unknowningly spread them to other locations or planted them in their yards. In an article appearing in the *New York Times* in 1995 concerning Priest Lake, the author commented on the beautiful expanse of the purple knapweed flowers lining Highway 57.

As time has progressed and the complexity of the weed issue has expanded and intensified, many individuals and government agencies have realized that there is a need to better respond to the noxious weed issue. A review of the 1988 IPNF Weed Pest Management Final EIS Summary of public comments (Appendix P) shows a large proportion of the commenters being against the use of chemical control. There were also several comments made that described how the commenter did not feel that there was a noxious weed problem.

A review of public comments for the Bonners Ferry Ranger District 1995 Final EIS for Noxious Weed Management Projects and a review of letters and comments received during scoping for the Priest Lake Ranger District Noxious Weed EIS show a different attitude. There seems to be more recognition of the noxious weed problem and more realization that the weeds do need to be dealt with in the most effective manner.

This change in attitude and greater awareness of the noxious weed problem has been demonstrated in the local area (Grussling pers. comm., 1996). A front-page article appeared in the Spokesman-Review on June 20, 1996, concerning the noxious weed problem in north Idaho. Vallentine (1988) explains that some of the worst noxious plant problems currently and projected for the future are caused by weed species such as leafy spurge, Canada thistle, the knapweeds, and Dalmation toadflax. All of these species are found on the Priest Lake Ranger District and have been expanding rapidly over the last several years.

CHAPTER IV
Environmental Consequences

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Introduction

This chapter discloses the potential environmental consequences of the proposed action and alternatives which were fully analyzed. Under sections identified as Alternative A, it describes the predicted effects of taking no action to control or reduce noxious weeds on the Priest Lake Ranger District. The discussions of Alternative B outline potential effects of using manual, cultural, and biological control agents. Alternative C shows the potential outcomes of treating noxious weeds with herbicides in addition to manual, cultural, and biological controls. Alternative A provides a base line for comparing the effects predicted under implementation of Alternatives B and C.

The effects analysis discussion follows the same general outline as Chapter III, Affected Environment. It first analyzes the effects of the various alternatives on control of existing noxious weed infestations and the methods employed in this program. State and County Activities are then discussed. The following section outlines the effects on the Vegetation Community Diversity, including sensitive plant populations. Because ecosystems are complex, and the resources do not function independently, some features have been combined to make it easier to understand the potential effects on the environment. Due to their close ties in the ecosystem; soils, water resources, and fisheries are discussed together in the next section titled "Soil and Aquatic Resources". This is followed by the predicted effects on Wildlife, and finally, Human Health and Human Resources.

To aid in the full disclosure of potential environmental consequences, this chapter concludes with discussion of the following items as required under NEPA:

- unavoidable effects,
- possible conflicts with other jurisdictions,
- relationship between short-term uses and long-term productivity,
- irreversible and irretrievable commitment of resources.

EXISTING WEED INFESTATIONS AND CONTROL METHODS

Alternative A: No Action

Noxious weeds would be controlled as outlined in the Idaho Panhandle National Forests Noxious Weed Management Environmental Impact Statement (USFS, 1987). Manual control of noxious weeds would be conducted within past timber sale areas, using KV dollars generated from timber sale receipts. Manual treatments would focus on the small infestations where control and success is most likely.

Large infestations of hawkweed would not be treated because of the excessive cost and the unlikely prospect of success. These large populations would continue to spread throughout the district along road corridors. They would continue to serve as a significant source of noxious weed seed infestations into the surrounding landscape.

Available biological control agents would be introduced into the large infestations of knapweed and St. Johnswort in an attempt to reduce the productivity of these populations in accordance with the Noxious Weed Management EIS. This would lessen the rate of spread within these areas but would not be likely to result in complete control.

This alternative would be very minimally effective in controlling existing and new populations. Use of herbicides would be limited to new noxious weed invaders, but this use would be limited. The IPNF Weed Management EIS directs that the total Forest-wide use of herbicide control on new invaders will not exceed five acres per year. It would be expected that Priest Lake's portion of that five acres would be considerably less than the actual amount of new populations.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests. The Forest Plan dictates that noxious weed control would include the current practices of inventory, monitoring, some hand-pulling, and some biological control. The No Action Alternative would continue such efforts.

Alternative B: Manual, Cultural and Biological Treatment

This alternative would utilize a variety of techniques to control noxious weeds.

Large infestations of knapweed and St. Johnswort would be treated by a combination of biological agents such as gall fly, root weevil and Klamath weed beetle. Mowing would be used along right-of-ways associated with Idaho Highway 57 to control noxious weeds, especially knapweed and St. Johnswort. This treatment also would be used in areas of common tansy. This would reduce the seed production of these species, and therefore, the spread.

Within some locations, manual and cultural control would eliminate noxious weed species such as knapweed, houndstongue, and goatweed. These species can be eliminated if a sufficient portion of the taproot and lateral roots are removed. However, these plants are prolific seed producers and seed reserves in the soil can remain viable for more than ten years. The disturbed ground around pulled plants would provide a very good seedbed for the later germination of noxious weed seeds. Therefore, hand-pulling would have to continue over many years to be highly effective. Re-vegetation of these disturbed areas as discussed in Features Common to All Alternatives would contribute in the control of these species.

Manual techniques would be used in attempts to control infestations of yellow and orange hawkweed and toadflax. As discussed in Chapter III, these species may not be effectively controlled under this alternative. Hand-pulling may stimulate growth and spread by preparing a disturbed seed bed, and fragmenting rhizomes. Biocontrol agents are currently not available for the hawkweeds.

Canada thistle is another species where manual control is typically unsuccessful. This species has an extensive root system and sends out new shoots from numerous buds on lateral roots. Three or more pulling sessions per year may reduce the competitive advantage of Canada thistle. However, Canada thistle could not be totally eliminated from these sites with manual or cultural treatment. The infestation would continue to fill in through vegetative reproduction in spite of a rigorous hand-pulling program. The greatest risk with manual and cultural treatment of Canada thistle is that the infestations would continue to spread vegetatively.

Alternative B would have the effect of controlling, but not eradicating, populations. Because of the extent of the existing infestations at some locations, noxious weed populations would not be eliminated under this alternative, even if complete funding became available. As discussed in Chapter III, monitoring of past manual and biological methods have not been successful in eliminating populations. Cultural treatments also would control, but not eliminate, populations. Estimations, based on the extent of each infestation and the species of noxious weeds present, indicate that infestations would not be eradicated on approximately 64 sites totalling 1,880 acres (72 percent of the project area). This alternative would be effective in eliminating or greatly reducing populations on about 28 percent of the project area.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

This alternative would utilize a variety of techniques, including the use of herbicides. Heavy infestations of hawkweeds would be treated using a combination of herbicide and manual control. No biological control methods are yet available for hawkweeds. Heavy infestations of knapweed, toadflax and St. Johnswort would be treated using either herbicides, biological control or both.

The use of herbicides and manual, cultural and biological methods would not result in the total elimination of noxious weeds from the project area. However, this alternative would significantly eliminate several populations and also reduce noxious weed populations within a large portion of the proposed treatment sites. Follow-up treatments and monitoring of treated infestations, along with cultural activities such as seeding of desired plant species, would reduce the likelihood of reinfestation.

Estimations based on the extent of each infestation and the species of noxious weeds present indicate that the infestation would not be eliminated on approximately 6 sites totalling 130 acres within the project area. This represents 94 percent of the project area. However, the populations of noxious weeds at these locations would be controlled and reduced, and their chance of spreading would be greatly lessened.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

STATE AND COUNTY ACTIVITIES

Alternative A: No Action

Noxious weed infestations would not be treated along approximately 32 miles of Idaho Highway 57 right-of-way, about 55 miles of county road right-of-way in both Bonner and Pend Oreille Counties, and roughly 130 miles of powerline corridor right-of-way within the project area. There would not be any opportunities for cooperation or the development of mutual agreements for the control of noxious weeds.

The Priest Lake Ranger District therefore would not comply with local and state laws governing noxious weed control as weeds on National Forest lands would be left untreated.

Consistency with the Forest Plan

This alternative would not be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests. For noxious weed control, the Plan states that weed control will be conducted in cooperation with counties, other agencies, and private landowners.

Alternative B: Manual, Cultural and Biological Treatment

There would be opportunities for cooperation and development of mutual agreement for the control of noxious weed along Idaho Highway 57 and county roads within the project area.

Noxious weed control along the Highway 57 right-of-way would be treated by manual and cultural control methods. Mowing would likely be the chosen method. This control is estimated to cost approximately $15,000 over the three-year period. Because mowing would not eliminate the noxious weeds, control is likely to be ongoing with additional and increasing costs.

Cooperation with the counties for control of noxious weeds along county roads within the project area would use a combination of manual, cultural and biological methods. Estimations for noxious weed control within these areas for 55 miles of county roads are $35,500 over the three-year period.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

There would be opportunities for cooperation and development of mutual agreement for the control of noxious weeds along Idaho Highway 57 and county roads within the project area.

Noxious weed control along the Highway 57 right-of-way would use herbicides. This control is estimated to cost approximately $12,000 over the three-year period.

Cooperation with the counties for control of noxious weeds along county roads within the project area would also use herbicides. Estimations for noxious weed control for 55 miles of county roads totals $4,000 for the three-year period.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

VEGETATIONAL COMMUNITY DIVERSITY

Alternative A: No Action

This alternative would have no direct effects on the vegetative community within the project area. Existing noxious weed populations are expected to grow, and new infestations would spread throughout the district. Spread of weeds would be likely as animals, people and other methods disperse seed or plant parts into new locations.

As noxious weeds spread, the negative indirect impact on the native vegetation by noxious weeds would become increasingly apparent. Man-made corridors, such as trails and roadsides, would become increasingly infested with noxious weed populations. Naturally occurring habitats, such as dry sites and riparian areas, which are vulnerable to weed infestations, would likely become overspread by noxious weeds.

Planty-Tacbacchi et al (1996) found that despite the number of plant species found with riparian habitats, these areas are very sensitive to weed invasions, This results from the various hydrological and geomorphological zones along these types of systems.

Several researchers have demonstrated that the number of native species, not just their total biomass, would decrease within locations infested by noxious weeds. Belcher and Wilson (1989) found 7 to 11 species within locations not infested by leafy spurge, but only 4 species within areas infested by leafy spruge. Tyser and Key (1988) reported significant reductions in species richness and diversity in knapweed infested fescue grasslands surveyed within Glacier National Park.

Potential Effects on Sensitive Plants

There would be no direct effect to sensitive plants.

Sensitive plant species which are associated with low-level disturbance would have the indirect effect of facing increased competition for these sites from the more aggressive noxious weeds. Such plants include fringecup (Tellima grandiflora), dwarf red blackberry (Rubus pubescens) and deerfern (Blechnum spicant). The sensitive species would most likely be outcompeted on sites where noxious weeds are present.

Yellow and orange hawkweeds have been observed invading moist forest habitats, and existing populations would most likely continue to spread into these areas. Existing populations of thistles and hawkweeds would most likely continue to invade riparian and wetland habitats also, as these areas act as natural travel and linkage corridors. The majority of sensitive plants known to occur on the Priest Lake Ranger District are associated with these habitats. Therefore, if noxious weed populations continue to grow and spread, the long-term cumulative reduction in potential sensitive plant habitat would be significant. Such loss is expected to have a detrimental effect on existing sensitive plant populations, and may eventually reduce viability of vulnerable populations.

Consistency with the Forest Plan

This alternative would not be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests. The Forest Plan dictates that the habitat of species listed in the Regional Sensitive Species list will be managed to prevent further declines in populations which could lead to federal listing under the Endangered Species Act.

Alternative B: Manual, Cultural and Biological Treatment

Native species could be effectively restored on many of the infested sites with a diligent program of manual and cultural control of the noxious weeds. In addition, control of these species on these sites would have the indirect effect of eliminating their spread to other areas.

The composition of native species would continue to be affected because the majority of noxious weed populations would not be eliminated, although the populations would be controlled. Manual treatment would also greatly reduce or eliminate seed production of noxious weeds.

Potential Effects on Sensitive Plants

Manual and cultural weed control may result in the inadvertent direct loss of sensitive plant individuals, particularly outliers and strays from larger established populations. However, weed treatment criteria outlined in this document would protect known populations, and also require screening of unsurveyed treatment sites. A short-term loss of isolated individuals, primarily from marginal habitats, may be necessary to protect the integrity of weed-free habitats and core populations of sensitive plants.

Biological control of knapweed, thistles, and yellow and Dalmation toadflax is not expected to affect any known sensitive plants directly or indirectly. The bio-control agents have been tested for host specificity, and have a very narrow selection range. There are no sensitive plant species closely related to these target weeds.

Biocontrol agents for goatweed however, are more general defoliating beetles, first introduced in the 1940's.

The beetles have been observed feeding on both native and exotic Hypericum species. Although the beetles prefer the weed species, small populations of the sensitive plant Canadian St. Johnswort (*Hypericum majus*), could be defoliated and significantly reduced, by the bio-control agents (Moritz, 1996). Therefore, no releases of the beetles would occur in or near known Canadian St. Johsnwort populations, or where a contiguous weed infestation would allow the beetles to travel to a population.

Cumulatively, the effect to sensitive plants would maintain sensitive plant populations and habitat if Alternative B is fully implemented.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

An integrated approach to noxious weed treatment would to be most effective method. Therefore, this alternative, combined with an aggressive prevention program, would provide the greatest long-term protection to sensitive plant populations and their habitat as well as other native vegetation.

As discussed under Alternative A, the failure to control noxious weeds on these sites would increase the probability that noxious weeds would spread to new sites. Likewise, the probability of weed spread would increase across the sites on which weeds are only partially controlled; for example, through manual treatment of hawkweed as described in Alternative B. The probability of further spread is compounded as weeds spread to new sites because these weeds then would contribute to the probability of additional spread. Weed populations would increase rapidly through compounded spread in Alternative A, and, to a lesser extent, in Alternative B. This, in large part, accounts for the explosive increase in certain weed populations in northern Idaho.

By contrast, the impacts of herbicides on vegetative biodiversity tend to be much more easily confined to the site of application. Although herbicides would directly affect some plant species on the site of application, the overall impact would be positive by preventing the spread of weeds. Impacts on vegetative diversity would be purely additive across the relatively few acres that would be sprayed.

The effects of manual, cultural and biological treatments would be the same as discussed under Alternative B. Therefore, they are not repeated here. Although herbicides are the only treatment described here, keep in mind that this alternative would also use the non-chemical methods of weed control.

Herbicides such as picloram and 2,4-D are often perceived as greatly reducing the diversity of plant species on a spray site. For example, picloram is thought to create a grass culture at the expense of broadleaf species. This generally is some what overstated. Two studies have been conducted in western Montana to measure the impact of herbicide application on native species. Willard et al. (1988) measured the impact of picloram on native grasses and broadleaf species. With the control of noxious weeds, the grass species generally showed marked increases. Some broadleaf species such as arnica and yarrow were greatly reduced. Generally, members of the asteraceae (composite family), fabaceae (legume), polygonaceae (buckwheat), and apiaceae (parsley family) were affected by picloram. In contrast, members of the brassicaceae (mustard family), liaceae (lily family), and scrophulariaceae (figwort family) were less affected by the spray.

In a more extensive study, Rice et al (1992) compared the impacts of the herbicides 2,4-D, picloram, and clopyralid to the impact of knapweed invasion on species number and diversity. The knapweed sites were in the initial stages of infestation, thus the diversity on these sites had not suffered as noted in the studies cited above by Tyser and Key (1988). Although the untreated knapweed plots in Rice's study started with slightly higher numbers of species and diversity, within two years the species number and diversity were virtually identical on all plots. Initially the impact to species was greater on sites sprayed with picloram than on sites sprayed with clopyralid.

Clopyralid affects members of only three plant families -- the composites, the legumes, and the buckwheats. Thus this herbicide can be sprayed near tree, shrub, and forb species that might be affected by picloram.

Aside from the on-site impacts to vegetation that might occur from herbicide application, these treatments would have the benefit of protecting sites that are currently uninfested by reducing the sources of further infestation. As discussed in the section on the impacts of Alternative A, the spread of these aggressive exotic species would significantly impact the vegetative diversity on sensitive sites in the Selkirk Mountains. Although herbicide application would have small and transitory impacts on the vegetation on treated sites, it would prevent much more serious, long-term effects on many susceptible acres within the ecosystem.

Potential Effects on Sensitive Plants

Herbicide treatment of noxious weeds may result in the direct loss of sensitive plant individuals, particularly outliers or strays from established populations. However, as with manual and cultural control, treatment criteria are designed to protect the viability of known sensitive plant populations. Herbicide spot-spraying, under conditions outlined in the treatment criteria, would allow effective weed control with little or no impacts to sensitive plant populations.

All District sensitive plant populations are mapped, and would be identified on the ground prior to or during any herbicide treatment. Recommended buffers and treatment criteria for riparian and aquatic sites would greatly reduce any indirect effects to sensitive plants or habitat in these areas. In addition, unsurveyed treatment sites would be screened for potential habitat, and surveyed if necessary.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Soils and Aquatic Resources

Treatments to control noxious weeds would have negligible effects on the soils on the Priest Lake Ranger District. However, the characteristics of the soil in a given area can have some influence on the treatment method chosen for a particular site. The soil can also lead to indirect effects on other resources, such as the water retention or percolation capacity at a particular site. Because this can influence the hydrology and consequently the fishery in a drainage, these resources are discussed together.

The following analysis focuses on the toxic characteristic of each herbicide proposed for use, the concentration of herbicides to which aquatic biota (fish and invertebrates) are exposed and the impacts to water quality from the alternatives. Differences in treatment were used to contrast effects on habitat between alternatives and determine the potential impacts to fish, macroinvertebrates and water quality. The effects analysis was based upon field reviews, watershed conditions, riparian zone conditions, professional consultation, literature reviews and the professional judgements of both the project Hydrologist and Fish Biologist.

Alternative A: No Action

As discussed in greater detail in the section on "Vegetative Community Diversity", without treatment it becomes increasingly likely that noxious weeds will become more widely established across the Priest Lake Ranger

District. An indirect effect of noxious weed invasion could be an increased water runoff and sediment yield from infested sites. Lacey et al. (1989) have shown an almost three-fold increase in sediment yield from knapweed sites compared to a non-infested bunch grass site. Runoff increased by about 50 percent from the knapweed site.

At the present time, most infested sites are along road clearings. Noxious weeds are probably having little effect on sediment yield in comparison to other road related activities (road use, maintenance, etc). Impacts from future spread of the weeds would depend on the slope, soil characteristics, precipitation patterns, and distance to water from the infested sites. However, even under the worst case noxious weed infestation scenario, it is unlikely that increase in sediment yield to streams would be sufficient to affect fisheries or water quality. Nevertheless there are some weed species that act allelopathically and actually prevent more desirable species (i.e. natives) from becoming established.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural and Biological Control

Manual treatment would result in localized soil disturbance. An increase in sediment to streams from the manual treatment along road cuts and fills and within the riparian areas is possible, but the increase would likely be undetectable for several reasons. First, disturbed areas would be replanted with grass seed after treatment, reducing erosion as roots became established. Second, not all sediment reaching ditchlines would be transported directly to streams. Many ditchlines are intercepted by relief culverts which drain onto the forest floor. Finally, soil disturbance would be minimal and localized in comparison to the entire watershed.

Cultural treatments (seeding, transplanting and fertilizing) would not affect fisheries or water quality. Fertilizers would be applied according to Forest Service and manufacture guidelines. Runoff nutrient concentrations therefore would not be large enough to enrich streams. Seeding and transplanting would involve limited soils disturbance.

Release of biocontrol agents would have no direct effect on fisheries or surface water quality. The biocontrol agents would not compete with aquatic insect species since their food base is very specific, nor would they provide more than incidental food source for fish. There are no cumulative effects with this alternative.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Control

Effects from manual, cultural and biological treatments are similar in Alternatives B and C.

The herbicides proposed for use on these site are all characterized by relatively low aquatic toxicity. The 96-hour LC_{50} for the seven herbicides is provided in Table IV-1. The 96-hour LC_{50} refers to the concentration that is lethal to 50 percent of the fish exposed at that level for 96 hours. The lower the LC_{50} the more toxic the compound.

Table IV-1 Toxic Levels of Herbicides to Fish

Herbicide (test species)	96 hour LC50 (milligram/liter)	LC50 divided by 10	NOEL (milligram/liter)
Picloram	3.5	0.35	0.29
2,4-D acid Would not be used (cutthroat trout)	24	2.4	not available
2,4-D amine (rainbow trout)	420	42	not available
Glyphosate (rainbow trout)	140	14.0	not available
Dicamba (rainbow trout	28	2.8	not available
Clopyralid (rainbow trout)	103	10.3	not available
Triclopyr (rainbow trout)	117	11.7	not available
Metsulfuron Methyl (rainbow trout)	150	15.0	not available
Notes: 2,4-D, dicamba, and picloram values are taken from Mayer and Ellersieck 1986 and Woodward 1976 and 1979. Clopyralid value is from Dow Chemical Company 1986. Triclopyr and metsulfuron methyl values from USDA 1992. Glyphosate values from USDA 1983. 2,4-D acid is the parent compound which is formulated in a variety of forms, including the amine which would be used under the 2,4-D alternative.			

Although the LC_{50} is frequently used as a toxicity standard, fifty percent fish mortality is generally not acceptable. Because we often do not have long-term test results that provide safe concentrations or no-observed-effect levels (NOEL), the EPA has recommended that the 96-hour LC_{50} be divided by 10 to set a standard for concentrations to protect aquatic species (U.S. EPA 1986). Table IV-1 provides these concentrations, which are used as a benchmark to judge the significance of possible impacts. Note that the NOEL for picloram developed from long-term laboratory studies corresponds fairly closely to the LC_{50} divided by 10.

In order to predict the potential water quality impacts of herbicide applications on the sites under consideration, it is important to distinguish between infiltration-dominated sites and runoff-dominated sites. In all but the most severe conditions, rainfall percolates into the soil on an infiltration-dominated site. On a runoff-dominated site, rainfall is more likely to produce overland flow. These two classes of sites are differentiated on the basis of vegetative cover, soil type, degree of disturbance and compaction, and slope.

The majority of the proposed treatment sites are on road prisms, road cuts and road fills which are all runoff-dominated. Treatment areas that are not runoff-dominated would be any site not associated with a road (i.e. meadows). Roads enhance runoff by concentrating flows on compacted road surfaces and ditches, intersecting groundwater flow from cut slopes, and using coarse material with low organic matter to create the fill slope. Since some of the sites are undisturbed forest/grassland soils, they were determined to be infiltration-dominated.

The amount of herbicide that could possibly reach a stream was estimated based upon whether a site was runoff- or infiltration-dominated. A study by Rice in 1990, reviewed numerous studies of picloram runoff to streams. It was determined that a maximum of 10 percent of the herbicide applied on a runoff-dominated site could be lost to the stream in a six-hour period. However, only 1 percent of herbicide applied on an infiltration-dominated site could be lost to the stream in a six-hour period.

Because of its relatively long environmental persistence and relatively low soil adsorption (high mobility), picloram represents the worst case scenario of a highly mobile herbicide. A report by Scott et al. (1976), of the Fish and Wildlife Service, concluded that a concentration of 0.6 ppm picloram decreased cutthroat fry growth by 25 percent. No adverse effects were observed when concentrations were below 0.3 ppm. Woodward (1979) concluded that picloram increased the mortality of fry in concentration above 1.3 ppm and reduced their growth in concentrations above 0.61 ppm when exposure exceeded 20 days.

On this basis, the worst-case concentrations of herbicide can be calculated for drainages in the vicinity of the proposed treatment sites. For the purpose of this analysis, the entire herbicide application was calculated per drainage as if weeds were sprayed continuously along each road in just one day instead of a matter of one or two months. Furthermore, it was assumed that a severe thunderstorm could wash 10 percent of the active ingredient into the stream on runoff-dominated sites over a six hour period. Continuing with the worst case scenario, the lowest streamflow was calculated for all affected waters and used to determine maximum concentration with the streams.

The lowest stream flows generally occur in the beginning of October, just prior to the fall rains. Though the October flows would be the lowest, all spraying would occur between May and August when the flows are higher. The streamflow data was collected from actual field data (DEQ and USFS) of gauged streams as well as calculated using Embry's water yield formula (1986).

Streams that had gauged data include Upper Priest River, Granite Creek, Reeder Creek and Kalispell Creek. All other streams had their low flows estimated using Embry's water yield formula. Embry's equation was used to calculate the average cubic feet per second (cfs) water yield for a seven-day, two-year low flow (September and October). In addition to calculating the concentrations for named streams, the estimated concentrations were calculated for those streams and springs with flows of 0.25, 0.5 and 1.0 cubic feet per second (cfs). The flow information was used to calculate concentration levels of the herbicides within the water bodies. See Table IV-2 for results.

Again it should be emphasized that these calculations represent the worst case scenario and the probability that these concentrations would be reached is very low. Application of site-specific Best Management Practices (BMP's) would make it unlikely that any herbicide would be detected in streams (see Chapter 2, Features Common to All Alternatives).

The initial concentration calculations show that in some instances, the concentrations exceeded the NOEL levels for specific biota. The highest concentrations of herbicides were in the smallest streams and springs. In terms of named drainages, the Kalispell Creek drainage showed the highest concentration of all herbicides proposed for use (Table IV-3). This is because of the amount of acreage proposed for treatment. However, these concentrations are for the worst case scenario are well below the estimated NOEL. Worst case scenario concentrations calculated in Table IV-2 are well below these documented effect levels or the 0.35 mg/L concentration listed in Table IV-1.

With the average low water cubic feet per second (cfs) water yield of these drainages, this analysis shows that 100 percent of the application amount scheduled for each drainage could be washed into the creek over a period of 6 hours and the concentration would still be less than NOEL.

Concentrations for 2,4-D, glyphosate, dicamba, clopyralid, triclopyr, and metsulfuron methyl entering streams under a worst case scenario are also low, see Table IV-2. The highest concentrations of these chemicals are 0.452618 mg/L, 0.238259 mg/L, 0.476412 mg/L, 0.233437 mg/L, 0.952824 mg/L, and 0.059434 mg/L respectively. These are far below the LC_{50} divided by 10 value reported in Table IV-1.

Table IV-2 Herbicide Concentrations mg/L (ug/L) Worst Case Scenario

Drainage	Picloram	2,4-D	Glyphosate	Dicamba	Clopyralid	Triclopyr	Metsulfuron Methyl
Upper Priest	0.000454	0.001725	0.000908	0.001816	0.000890	0.003631	0.000227
Hughes Fork	0.035599	0.135314	0.071229	0.142427	0.069788	0.284855	0.017768
Granite Creek	0.001872	0.007116	0.003746	0.007490	0.003670	0.014980	0.000934
Kalispell Cr	0.119077	0.452618	0.238259	0.476412	0.233437	0.952824	0.059434
Reeder Creek	0.034295	0.130357	0.068620	0.137210	0.067231	0.274420	0.017117
Binarch	0.030994	0.117809	0.062015	0.124003	0.060760	0.248005	0.015470
Lamb Creek	0.021449	0.081531	0.042918	0.085817	0.042049	0.171634	0.010706
U.West Branch	0.004640	0.017637	0.009284	0.018565	0.009096	0.037129	0.002316
L.West Branch	0.046670	0.177394	0.093380	0.186720	0.091491	0.373439	0.023294
Beaver Creek	0.011334	0.043079	0.022677	0.045344	0.022218	0.090688	0.005657
Quartz Creek	0.061164	0.232488	0.122382	0.244710	0.119905	0.489419	0.030528
Lower Priest	0.000003	0.000012	0.000006	0.000012	0.000006	0.000024	0.000002

Herbicide concentrations in streams smaller than those identified above are not expected to reach NOEL levels because application rates would follow INFISH Standard and Guideline RA-1, and existing IPNF Weed EIS and the State of Idaho Best Management Practices (BMPs) guidelines and the State of Washington BMPs if scheduled within RHCAs.

When herbicides are applied, there is often concern that they will bioconcentrate in organisms through uptake and retention by tissue or gills. For this to occur, retention of a pollutant must exhibit a high resistance to breakdown or excretion by an organism to allow a sufficient uptake period for an elevated concentration. A high concentration must also be applied for an extended period of time. In terms of the amount and timing of this project's application of herbicides, there is a low risk of bioconcentrating.

Again it should be emphasized that the calculations for stream concentrations presented earlier represent a worst case scenario and the probability that these concentrations would be reached is very low. It is unlikely that any herbicide would be detected in stream water as a result of these spray operations because of the low level of herbicide use spread over a period of two months or more compared to the higher water yields in these drainages over the same period of time.

Other Sensitive Aquatic Biota

Concern has been expressed over the possible cumulative or synergistic effects of mixtures of chemicals on sensitive resources. Synergism is a special type of interaction where the combined effect of a certain herbicide with other chemicals in the environment is greater than the effect of any one chemical alone. This issue is discussed in greater detail in the section on Human Health Impacts. As noted there, EPA currently supports an additive model in predicting such interactions. Even with the assumption that the chemicals are present simultaneously, their additive concentrations are still well below the NOEL thresholds.

Furthermore, where more than one herbicide is applied, the dosage would be reduced (personal communication, Bob Klarich, Bonners Ferry District Planner, May 1996). From the small doses expected from this project, synergistic effects are not expected.

Herbicides can also indirectly influence fish populations by affecting the populations of other organisms upon which fish are dependent. Table IV-3 provides toxicity data for other aquatic organisms (eg. macro-invertebrates). As indicated in Table IV-3, these herbicides are generally less toxic to lower orders of aquatic organisms than to fish species. Although the species listed in Table IV-3 are not the only aquatic organisms found in these waters, they are used by the U.S. Fish and Wildlife Service and the EPA as indicators of a wide range of aquatic organisms. Again, the worst-case concentrations of the herbicides in water are well below levels that would affect these organisms.

Table IV-3. Levels of herbicides toxic to aquatic organisms other than fish

Herbicide	Test Species	Test Results
Picloram	*Daphnia magna*	48 hr LC50 is 76 mg/L
Picloram	Scuds (*Gammarus fasciatus*)	96 hr LC50 is 27 mg/L
Picloram	Scuds (*Gammarus pseudolimnaeus*)	96 hr LC50 is 16.5 mg/L
Picloram	Stonefly (*Pteronarcys californica*)	96 hr LC50 is 4.8 mg/L
2,4-D amine	*Daphnia magna*	48 hr LC50 is greater than 100 mg/L
2,4-D amine	Seed shrimp (*Cypridopsis vidua*)	48 hr LC50 is 8 mg/L
2,4-D amine	Scuds (*Gammarus fasciatus*)	96 hr LC50 is greater than 100 mg/L
2,4-D amine	Midges (*Chironomus plumosus*)	48 hr LC50 is greater than 100 mg/L
Glyphosate	Scuds (*Gammarus fasciatus*)	96 hr LC50 is greater than 43 mg/L
Dicamba	*Daphnia magna*	96 hr LC50 is greater than 100 mg/L
Dicamba	Sow bugs (*Asellus brevicaudus*)	96 hr LC50 is greater than 100 mg/L
Dicamba	Scuds (*Gammarus fasciatus*)	96 hr LC50 is greater than 100 mg/L
Dicamba	Shrimp (*Palaemonetes kadiasis*)	96 hr LC50 is 28 mg/L
Clopyralid	Daphnids (*Daphnia* sp.)	48 hr LC50 is 225 mg/L
Clopyralid	Ram's horn snail (*Helisoma trivolvis*)	No mortality after 48 hours in a solution containing 1 mg/L
Clopyralid	Green Algae (*Selenastrum capricornutum*)	96 hr LC50 is 61 mg/L
Clopyralid	Duck weed (*Lemna minor*)	No growth reduction at 2 mg/L after 21 days

Table IV-3. Levels of herbicides toxic to aquatic organisms other than fish (continued)

Herbicide	Test Species	Test Results
Triclopyr	*Daphnia magna*	48 hr LC50 is 1,170 mg/L
Metsulfuron Methyl	*Daphnia magna*	48 hr LC50 is greater than 150 mg/L
Values provided on this table are taken from Mayer and Ellersieck 1986 (2,4-D, dicamba, and picloram), Dow Chemical Company 1986 and undated (clopyralid), USDA 1992 (triclopyr, metsulfuron methyl), USDA 1983 (glyphosate).		

Although the Forest Service would be the responsible party for ensuring that the weed eradication is completed in the most environmentally sensitive manner, the agency relies upon the EPA for determining the possible aquatic and other environmental impacts of these herbicides under their registered use patterns. If unacceptable impacts are suspected, the EPA must require additional testing and monitoring under the pesticide registration process.

During the registration or reregistration of the compounds proposed for use, the EPA did not identify impacts to aquatic organisms as a major concern. In fact, the EPA continues to allow the application of some formulations of 2,4-D directly to water. The major surface water concern identified for picloram is the possible contamination of irrigation water and effects downstream on sensitive crops. Picloram, used as a herbicide, is not in itself dangerous to humans. Other less mobile herbicides may be more threatening to humans, but they are less mobile in the soil and therefore they are not listed as being as likely to contaminate people.

Forest chemicals have great potential for indirectly altering aquatic communities and fish habitat. Herbicides can modify the natural patterns of terrestrial plant succession that determine the structure and function of stream ecosystems. In assessing the potential indirect effects of herbicides on riparian vegetation and fish habitat, land managers must consider the influence of protective measures.

The protective measures for riparian wetland habitat are designed to eliminate overspray and non-selective treatment that would have an impact on riparian vegetation. The selective treatment of noxious weeds in these areas is expected to not result in indirect effects to riparian vegetation, and therefore, aquatic communities and fish habitat.

Compliance with "INFISH" Strategy

INFISH standards and guidelines (S&G) that would apply were needed to promote the long-term integrity of inland native fish populations and aquatic habitat, and contribute to attainment of "Riparian Habitat Objectives" (pages E-6 through E-13 FONSI, USDA 1995). Spraying would follow INFISH S&G RA-1 and existing IPNF Weed EIS guidelines if scheduled within RHCAs.

Forest Plan Consistency

Alternatives A, B and C would be consistent with the Forest Plan management objectives of maintaining and improving fish populations and their habitat, protecting soil productivity, and maintaining water quality. The Forest Plan Goals (p. II-1 and II-2) that would be met include Goals 4, 7, 9, 11, 12, 13, 17, 18, and 19. The Forest Plan Standards that would be met include Standards for Sensitive Species (Standard 9, p. II-28) to manage the habitat of sensitive species to prevent further declines in population, and the Standards for Water (Standards 1, 2, 3, 5, 6 and 7, p. II-33) which insure that management activities will not adversely impact water quality.

Wildlife

Alternative A, No Action

The No Action Alternative would have no direct impact in the short-term on either threatened and endangered species or on wildlife species in general. The spread of noxious weeds would not likely affect the habitat for many wildlife species in the short-term. However; in the long-term as more native habitat is replaced or the quality is reduced by increasing populations of noxious weeds, wildlife habitats would be diminished. The federally listed species which would be most affected would be the herbivorous species such as the grizzly bear or species which prey on herbivorous species such as the gray wolf. Of particular concern is the impact on grazing animals such as deer.

As noted in the previous section on vegetative community, noxious weeds can effectively replace native vegetation on infested sites. Although there are reports of deer and elk foraging on knapweed (Willard et al 1988), it is not a preferred forage species. A Forest Service assessment of spotted knapweed infestation on winter range in the Lolo National forest predicted a loss of 220 elk annually by 1998. This would reduce the ability of the area to support gray wolves as well, and if infestation were to become extreme it could affect the wolf populations.

Grizzly bear habitat could have a reduction in succulent vegetative forage if sites were overrun by noxious weeds. It has been noted by Jonkel (Cook, 1981) that the knapweeds drive out the native plants that produce roots, fruits and other vegetation the grizzly bears depend on for gaining 85 percent of their hibernation weight. This would mean that the same amount of land might not support as many bears.

Woodland caribou and bald eagle would not be affected by the spread of noxious weeds. Caribou are ungulates, but their diet is very different from elk and deer, and would be unlikely to be directly or indirectly affected by the spread of noxious weeds.

Sensitive wildlife that depend on habitat features that are not immediately affected by noxious weed contamination would be likely to be directly affected. Such species as black-backed woodpecker, flammulated owl and boreal owl depend more on snags than on ground vegetation. Species associated with water such as common loon, Coeur d'Alene salamander and harlequin duck would not be affected because of the precautions noted for water quality. These species are not dependent on the vegetation affected by noxious weed spread. Northern bog lemming, which are associated with bogs but also occur in old growth moist forests, would be unlikely to be directly affected for the same reasons.

Carnivores such as wolverine, fisher and lynx could be indirectly affected by noxious weed spread in much the same way as the wolf. The herbivore prey that they depend on could be reduced in number and kind by noxious weed spread. Of these species, the fisher would be least affected because they are most dependent on older forests with dead and down woody material rather than on a vegetation understory.

The Townsend's big-eared bat is limited within the project area by the lack of suitable habitat such as caves or suitable mine adits. Neither the No Action Alternative or the action alternatives would have any direct, indirect or cumulative effect on habitat for this species.

Management indicator species would be affected in the same types of ways as the threatened or endangered species. The white-tailed deer would be most directly affected by the No action alternative's allowance of the spread of noxious weeds. This would be a result of the available forage base being altered. The pileated woodpecker and the pine marten would be least affected by the spread of noxious weeds. Their habitat is primarily large timbered stands that are not favored by any noxious weeds currently under consideration. Northern goshawk are avian predators which prey on a variety of species, some of which are herbivores and could be adversely affected by the spread of noxious weeds.

Other groups of fauna, such as neotropical migrant birds, would be affected in different ways depending on their habitat needs. In general, the herbivorous or granivorous species would be most affected by the spread of noxious weeds in the same way as the species discussed earlier. The least affected species would be those dependent on large timber or water-related habitats, or those whose habitat did not overlap those sites prone to infestation by noxious weeds.

Overall, for these wildlife species, the greatest effect of Alternative A would be the change in diversity of native plant species upon which the native fauna depends. This is a serious concern that probably would affect some species in a more impactive way than other species and not necessarily in a predictable way.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural and Biological Treatment

Implementation of this alternative would not have any direct effects on wildlife or important wildlife habitats. It is likely that because of the expense associated with full implementation of this alternative, that this alternative would not be fully implemented.

If this alternative allowed the spread of noxious seeds, it could have the same indirect effects as the No Action Alternative.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

The discussion of effects of implementation of this alterative is limited to the effect of herbicide treatment. The effects of treatment types such as manual, cultural and biological would be the same as Alternative B.

Indirect effects to wildlife for chemical treatment would be primarily for disturbance for the spray and survey crews. This effect would be most noticeable on grizzly bears, wolverine and goshawk. Administrative use guidelines for any motorized use behind gates would be implemented, so the effects of disturbance would be controlled to acceptable levels with regard to grizzly bears. Disturbance to the other species would be no greater than that of other forest level activities.

None of the herbicides proposed for use bioaccumulate (bioconcentrate) in wildlife in concentrations greater than their general environmental concentrations. By contrast, concentrations of some organochlorine pesticides, such as DDT, in some wildlife species could be as much as 100,000 times higher than the concentrations in the general environment because these chemicals bioaccumulate.

Inferences of possible effect can be made by comparing the exposure levels wildlife would experience with the concentrations that elicit responses in wildlife. As discussed in the risk assessment referenced in the section on Human Health, immediately following an application of 1 pound of herbicide per acre the herbicide concentration on grasses and small forbs would be about 125 parts per million (125 ppm). Within 90 days, the concentration of picloram on vegetation would be about 25 parts per million (Watson et al. 1989). The concentrations of 2,4-D amine, dicamba, and clopyralid would likely be less than that of picloram because of their faster breakdown rates.

The avian toxicity of these herbicides is extremely low (USDA Forest Service 1984). The picloram LC50 for mallard ducks and quail is in excess of 10,000 parts per million, which was the highest dose tested. Comparable values for the highest dose tested of clopyralid are 4,640 ppm; for dicamba in excess of 10,000 ppm; and for 2,4-D amine in excess of 5,000 ppm.

Feeding studies on grazing animals confirm the low toxicity of these herbicides. Deer that were fed foliage treated with 2,4-D at up to four times the rate proposed for this project showed no ill effects (Cambell et al, 1981). Cattle fed picloram-treated hay with concentrations 20 times and greater than those expected on the proposed sites suffered no lethal effects (Monnig, 1988). Heifers given dicamba at 20,000 ppm in feed showed no ill effects (Edison and Sanderson, 1965). Clopyralid feeding studies with grazing animals are not available but would likely be similar to picloram, which is close to picloram's chemical analogue.

Comparisons of the expected environmental concentrations with the toxicity levels of these herbicides indicates that negative effects on birds, rodents, and grazing animals are not expected. In addition, the evidence reviewed in the Human Health Risk Assessment indicates that these herbicides are quickly excreted by exposed animals. Thus, effects on predators such as wolves or on raptors such as eagles or falcons are not reasonably expected. Because these herbicides do not bioaccumulate, the cumulative impacts of spraying sites inside and outside of the National Forest would be insignificant.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Human Resources and Human Health

Alternative A: No Action

The spread of noxious weeds within the National Forest is likely to have little impact on human health and safety. Noxious weeds can have deleterious health impacts on humans, attested to by the fact that certain noxious weeds are placed on county and state noxious weed lists due to their effects on human health. Human reactions range from allergic reaction to skin irritation and as in the case of leafy spurge, the possibility of blindness (Callihan et al, 1991). It should also be noted that while the potential does exist for severe reactions, the probability of these occurring is very low.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural and Biological Treatment

Manual Treatment

The direct impacts to human health and safety from manual treatment are likely to be minor. Possible effects include a variety of sprains, cuts, and skin irritation to the individuals performing the work. Skin irritations may result from a reaction to the sap of various noxious weeds such as knapweed or to the physical parts of the plant itself such as spines in the thistles. Gloves, long-sleeved shirts, and boots would be required for manual controls. Due to the nature of the worksites, other minor injuries such as sprains or strains from repeated bending or uneven ground surfaces would result.

Indirect impacts may include a high turnover in the workforce.

The cumulative effects to human health would be attributed primarily to the increased exposure to these potential risks.

Cultural Treatment

The treatment of noxious weeds using cultural methods such as mowing, clipping, and burning possibly would have some direct impacts. The potential effects are similar to those listed for manual treatment: sprains, cuts, burns, and skin irritation to the individuals performing the work.

Indirect impacts would include the potential for increased allergies from the mowing and burning operations.

The cumulative effects to human health would be attributed primarily to the increased exposure to the potential risks listed above and reduced impact of potential effects by noxious weeds.

Biological Treatment

The release of biological control agents for different species of noxious weeds would pose no threat to human health or safety.

The cumulative effects would be attributed primarily to the reduced risk of further noxious weed spread, which would reduce the potential for allergies and the other treatment's direct impacts.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

The effects on human health for manual, cultural, and biological control would be the same as disclosed under Alternative B.

Treatment with Herbicides

There is a wide variety of opinions within the general population on the value and safety of pesticides, including the herbicides proposed here. Many people, particularly in rural and agricultural settings, view pesticides as a necessary part of business and, if used properly, a relatively safe tool. However, the risks of pesticide use are being questioned for many reasons. Many of these questions stem from perceptions of problems and many questions stem from actual concerns.

The Northern Region of the Forest Service (Region 1) has analyzed the risk of the use of clopyralid, 2,4-D, dicamba, glyphosate, metsulfuron methyl, picloram, and triclopyr to control noxious weeds. This analysis is presented in two documents: Risk Assessment for Herbicide Use in Forest Service Regions 1, 2, 3, 4, and 10 on Bonneville Power Administration Sites (USDA Forest Service 1992), and Human Health Risk Assessment for Herbicide Application to Control Noxious Weeds and Poisonous Plants in the Northern Region (Monnig 1988).

The analysis of the human health risk from pesticide use follows the same basic format as outlined under the section for aquatics. The toxicity information is reviewed for the herbicides of interest in order to determine the levels of these chemicals that would be harmful to human health. Exposures and doses that might occur as a result of these projects are then estimated for workers and members of the general public. In the final step, the toxic effect levels established in the first step are compared to dose levels to determine the possibility of health impacts.

A considerable body of data from tests on laboratory animals is available for these herbicides. Most of these tests have been conducted as a requirement for EPA registration of these compounds for use in the United States. It should be noted that none of these compounds have completed all tests required for final registration. Current federal regulations allow for conditional registration pending the completion of all tests as long as no unreasonable adverse effects are found in the interim. This allowance for continued use before all testing is completed concerns some members of the public and has led to charges that "untested" pesticides are allowed on the market. All of the herbicides proposed for use within this document are EPA approved for use according to their labeled instructions, are conditionally registered, and have been assigned EPA registration numbers.

All of the herbicides analyzed here have been subjected to long-term feeding studies that test for general systemic effects such as kidney and liver damage. In addition, tests of the effects on reproductive systems, mutagenicity (birth defects), and carcinogenicty (cancer) have been conducted. No-observed-effect levels (NOEL) are available for most types of tests. A NOEL is the highest dose in a particular test that did not result in adverse health impacts to the test organism.

Extrapolating a NOEL from an animal study to humans is an uncertain process. The EPA compensates for this uncertainty by dividing NOELs from animal tests by a safety factor (typically 100) when deciding how much pesticide will be allowed on various foods. This adjusted dose level is referred to as the Acceptable Daily Intake (ADI) and is presumed by the EPA to be a dose that is safe even if received every day for a lifetime. This value is usually expressed as milligrams of herbicide allowed per kilogram of body weight (mg/kg).

In order to evaluate the effects of herbicide treatment on human health the risks were looked at in three ways. Direct effects are those effects directly related to the applicators. Indirect effects are those effects related to people who could be affected by the results of the herbicide treatment such as people re-entering a treated site or affected by run-off of the herbicide. Cumulative effects are those effects which would accumulate and have an increased effect over time, such as continued exposure to the herbicides or herbicide treatment.

Table IV-4. Acceptable Daily Intake (ADI) mg/kg/day

Herbicide	ADI EPA	ADI WHO*
Picloram	0.07	
2,4-D	0.01	0.3
Glyphosate	0.1	
Dicamba	0.03	
Clopyralid	0.5	
Triclopyr	0.025	

Table IV-4. Acceptable Daily Intake (ADI) mg/kg/day (continued)

Herbicide	ADI EPA	ADI WHO*
Metsulfuron Methyl	0.25	

Notes: Values for ADI taken from USDA Forest Service (1992). The values are established by the EPA and are listed for all of the chemicals of concern. For 2,4-D the *World Health Organization has established an ADI of 0.3.

Worker doses vary depending on several factors. The conditions under which the herbicide is applied will affect the level of exposure. Higher winds create more drift, especially when a high pressure nozzle is used which increases the chance of volatilization. Using appropriate personal protective equipment (PPE), as required, can lower the exposure for workers by as much as 68% (USDA Forest Service, 1992). The using of PPE is critical as most application exposure to herbicides is dermal, not respiratory (Monnig 1988). Finally, the attention and care given by a worker mixing, loading, or applying herbicides greatly influences the risk of exposure. Proper training and certification for the mixing, loading, and application of herbicides is essential to reduce the risks.

The one day dose for workers applying 2,4-D with a backpack sprayer could exceed the EPA's recommended daily dose. However, the risks would be very small because the spraying would only take place a few weeks per year and the ADI assumes a lifetime of doses.

There is the possibility of idiosyncratic responses such as hypersensitivity in a small percentage of the population. These persons are generally aware of their sensitivities since they are typically triggered by a variety of natural and synthetic compounds. Such persons would not be permitted to work on the spray crews.

Indirect effects would be those effects to people entering a previously treated area and being exposed to herbicide residues. Concerns are raised about the possibility of consuming wild foods such as berries or fungal foods after herbicide treatment has occurred. The potential for an individual to consume wild foods that have been treated is low. Most spraying would occur along roadsides in the road right of way where the occurrence of wild foods is low. Occasionally a spray swath may overlap with huckleberries and the berries may be sprayed. Within a few days of the treatment the huckleberry plants would turn brown and lose their fruit. The berries that were sprayed would not be picked. However the period of time between the herbicide application and the loss of fruit has the potential to have berries picked and consumed.

To determine the dose for consumption of huckleberries that were accidentally sprayed with herbicide, the USDA Forest Service Risk Assessment's (1992) methodology was used. Oral consumption of 2,4-D was used to analyze the concentration in the berries and the dose received by a person consuming sprayed berries. The analysis used 2,4-D because it would have the highest concentration based on its application rate.

Based on this methodology, a 150-pound person would have to consume 280 pounds of directly-sprayed huckleberries each day for a lifetime in order to reach the EPA's acceptable daily intake (ADI) for 2,4-D. The likelihood of this happening is extremely low for several reasons. First, the probability of a large amount of huckleberries being sprayed in a road right of way is low. Second, the chance of a person picking huckleberries in a road right of way where weeds are occurring is low. Third, the probability of a person picking and consuming 280 pounds of sprayed huckleberries in one day is extremely low. Lastly, the probability of a person consuming such a large amount of huckleberries for a lifetime is extremely low.

Similarly, the doses to people hiking through a recently sprayed area would be low (USDA Forest Service 1992 and Monnig 1988). The main route of ingestion of herbicide would be through the skin. If a hiker did walk through an area just sprayed with 2,4-D, the dose received would be over 1000 times lower than the ADI established by the EPA.

There are other methods of possible exposure to the herbicides, but the doses received would be extremely low and well within the safe limits that the EPA recommends. Based on the criteria used for herbicide application on the District and the legal requirements regarding herbicide handling and application, the risks would be minimal.

Cumulative effects would apply to both workers and the public who are exposed to herbicides. There is an increased concern about the continued exposure to herbicides and the risks associated with them. The ADI is based on the level of herbicide that would be acceptable each day for a lifetime. Over time a person may be exposed to quantities of herbicide, but since spraying would occur only a few weeks each year the daily intake over a lifetime would not even come close to the EPA's standard.

The issue of delayed effects of low levels of chemical exposure is raised by some people. Principal among these effects is cancer. All of these herbicides have undergone testing for cancer. The evidence for cancer initiation or promotion from 2,4-D and picloram has been widely debated. Current evidence is mixed, and these compounds seem at most weakly carcinogenic. Appendix C contains a letter from Dr. John Graham of the Harvard University School of Public Health that summarizes the current evidence on 2,4-D. As noted in the letter, the weight of evidence that 2,4-D is a carcinogen is not strong, and even if it is ultimately shown to be an animal carcinogen, it is unlikely to be a very potent one.

Nonetheless, the Risk Assessments cited above assume that the two herbicides are carcinogens. These analyses also assume that any dose of a carcinogen could cause cancer and that the probability of cancer increases with increasing doses. Estimations of the probability of developing cancer from exposure to these compounds are based on a conservative extrapolation from cancer rates in animals subjected to the chemical over a lifetime.

The risks are relatively low compared to other commonly encountered risks. For example, there is an increased risk of cancer accumulated from living in Denver, Colorado, at a high elevation for 1.5 months compared to living at sea level, because of cosmic rays. Smoking two cigarettes increases the risk of cancer by one in a million. The projected cancer rates are highest for workers since their doses are highest. Cancer probabilities of workers would increase by about one in a million after spraying 2,4-D for 193 days or spraying picloram for about 17,000 days. (Ref. Monnig 1988). These numbers were derived using a worst case scenario of a high dose of herbicide with a low amount of worker protection. The cumulative impact from spraying at the rates proposed would not be significant.

Concerns are occasionally raised about the cumulative and synergistic interactions of the pesticides and other chemicals in the environment. Synergism is a special type of interaction in which the cumulative impact of two or more chemicals is greater than the impact predicted by adding their individual effects. The Risk Assessments referenced above addresses the possibility of a variety of such interactions. These include the interaction of the active ingredients in a pesticide formulation with its inert ingredients; the interactions of these chemicals with other chemicals in the environment; and the cumulative impacts of spraying proposed here and other herbicide spraying the public might be exposed to.

Basically, we cannot absolutely guarantee the absence of a synergistic interaction between the pesticides examined here and other chemicals to which workers or the public might be exposed. It is possible, for example, that exposure to benzene, a known carcinogen that comprises one to five percent of automobile fuel exhaust, followed by exposure to any of these herbicides could result in unexpected biochemical interactions. Testing the virtual infinite number of chemical combinations would be impossible.

There are a number of reasons to expect that synergistic or other unusual cumulative interactions would be very rare. Mullison (1985), Monnig (1988), and USDA Forest Service Risk Assessment (1992) refer to low teratogenic, mutagenic, and carcinogenic properties of herbicides compared to naturally occurring chemicals in foods. The low, short-lived doses that would result from spraying these herbicides are very small compared to many other chemicals in the environment. For these relatively small doses a synergistic effect is not really expected as stated by the EPA in a discussion entitled *Guidelines for the Health Risk Assessment of Chemicals (Federal Register September 24, 1986)*. They suggest in their discussion of interactions (synergistic or antagonistic effects) that "there seems to be consensus that for public health concerns regarding causative (toxic) agents, the additive model is more appropriate (than any multiplicative model)."

In summary, although ironclad guarantees cannot be given, we would reasonably expect that the human health impacts from herbicide applications on the proposed sites would be insignificantly small.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Economic Setting

Employment

Alternative A: No Action

The No-Action Alternative would not generate any local employment in the treatment of noxious weeds.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural, and Biological Treatment

Alternative B would require the largest workforce and would be the most costly to implement as shown in Appendix E. To complete the estimated 315 acres of manual control, a workforce of 35 persons would be needed for 90 days for the first year. For the second and third years, a crew of 31 people would be needed. This level of employment would reduce the existing county unemployment. The jobs would be unskilled labor, and the wage level would be low. Turnover would be expected to be high because of the monotony and hard physical labor associated with the job of manually pulling weeds. The work would be completed with a combination of contracting and Forest Service employees.

This alternative, as well as Alternative C, would include an opportunity to cooperate with state and local governments and local citizens or groups in the control of noxious weeds. Portions of the work could be accomplished in this manner.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

Alternative C would not require a large workforce as included in Alternative B. This alternative would include 15 acres of manual treatment during the first year of implementation, and would need 2 persons for 75 days to complete. During the second and third years, 50 days by one worker would be needed. This work would be accomplished by existing Forest Service employees, and, therefore, would have no effect on local unemployment. Besides manual control, there would be biological and herbicide control; the majority of this work also would be accomplished by the Forest Service workforce. A portion of the herbicide treatment could also be contracted.

This alternative also would build cooperative efforts with state and local governments as well as partnerships with other groups or individuals to accomplish portions of the work.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Timber Industry

Alternative A: No Action

Under the No Action Alternative, noxious weeds from existing populations would spread in areas of ground disturbance including logging sites and new road construction and would affect other resource values. However, as with the action alternatives, disturbed areas would continue to be vegetated with grasses and other vegetation by the timber sale purchaser, and KV dollars would continue to be collected for noxious weed control to ensure that noxious weed spread would be limited. These control actions have reduced the spread of noxious weeds, but invasion from surrounding untreated infestations would continue to occur following post-sale KV activities.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural, and Biological Treatment and Alternative C: Manual, Cultural, Biological and Chemical Treatment

The action alternatives would have a minimal effect on the timber industry. Pre-work clean-up would be required for equipment in logging areas, and other ground-disturbing operations in areas that have been treated for noxious weeds. This practice has been implemented in other areas, and has proven effective in reducing the spread of noxious weeds. Control actions of existing infestations in conjunction with post-sale noxious weed prevention would be effective in eliminating noxious weeds over the district.

There would be an indirect benefit of reducing noxious weed competition with seedlings in areas planted with trees. This would ensure better regeneration of reforested areas and reduce costs of interplanting or future weed control.

Consistency with the Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Agriculture and Grazing Industry

Alternative A: No Action

There would be no treatment of noxious weeds on the grazing allotments on National Forest lands and therefore no direct effect. The indirect effect would be that forage quantity and quality would be reduced in the long-term on these allotments as existing weed populations continue to increase. Cumulatively, there would be a reduction in numbers of permitted animals on allotments due to decreased forage capabilities and therefore a loss of income to grazing permittees.

Noxious weeds would continue to spread from National Forest lands to privately owned agricultural lands. This would cause continued costs to individual landowners for reducing noxious weeds on their properties and would reduce forage capabilities.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural, and Biological Treatment

There would be a short-term direct effect on grazing allotments on National Forest lands. Grazing animals would be temporarily moved to allow manual and cultural treatments to occur. The permittees would be notified of the dates of implementation. There would be minimal effect to neighboring landowners as no treatment would occur on private lands. The number of workers performing manual treatments would cause short-term disturbance to grazing animals on private lands because of noise levels.

Alternative B would reduce noxious weeds, and therefore, the economic effect of noxious weeds on the agriculture industry. There would be increased productiveness of forage on treated National Forest lands and allotments. Indirectly forage on private lands would increase because of reduced encroachment of weeds from National Forest lands. There would be reduced treatment costs for adjacent landowners because weeds would be controlled on federal lands.

Cumulatively, there would be no reduction in permitted animals or a loss of income because of reduced forage resulting from noxious weed infestations.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

Noxious weeds would be reduced. This reduction would improve forage quantity and quality on agricultural lands. Cumulatively, there would be no reduction in permitted animals on allotment or loss of income for ranchers because of noxious weeds.

Allotment permittees would be notified prior to any herbicide application on their allotments and would be advised of any restrictions regarding livestock use, movement, management, etc. found on the herbicide label.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Tourism Industry

Alternative A: No Action

Noxious weeds would continue to spread and alter the visual character of the landscape. Perception of the Priest Lake Basin would change as the landscape changes, though there may not be any change in numbers of tourists to the basin.

Alternative B: Manual, Cultural, and Biological Treatment and Alternative C: Manual, Cultural, Biological and Chemical Treatment

The action alternatives would not have any direct effect to the tourism industry and employment. Both alternatives would have an indirect and cumulative effect of maintaining a "more natural" scenic quality of the area by restoring weed-infested sites with native vegetation. However, this effect would be minimal in terms of economic gain or employment.

Consistency with the Forest Plan

These alternatives would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Lifestyles

Alternative A: No Action

The No Action Alternative would not cause any direct effects in terms of lifestyles. Permanent and seasonal residents and recreationists would continue to enjoy a variety of recreational pursuits on National Forest lands.

Alternative A would have the indirect effect of spreading existing weed populations into new areas on visitor's clothing, recreational equipment, packstock, and vehicles. Noxious weeds would become established on sites that currently have no populations.

Alternative B: Manual, Cultural, and Biological Treatment

This alternative would prevent the negative direct and indirect impacts of exotic species on recreation opportunities. Native vegetation including wildflowers, grasses, trees, and berry-producing plants would not be out-competed by noxious weeds. The indirect effects of noxious weeds to wildlife, watershed, and other resources would be prevented. A more "natural-appearing" landscape would be maintained. By eliminating existing populations, forest users would not continue to spread noxious weeds into new areas.

Implementation of Alternative B would have a direct effect on forest users. A complete program of manual and cultural treatments would require the labor of 35 individuals over a 90-day period as shown in Appendix E. A workforce of this size would affect the solitude of recreationists; especially in such areas as the wilderness, along trailsides, along the lakeshore, and other remote settings. This effect would be short-term and only during the implementation of the project. Residents and recreationists, however, would continue to have the opportunity to enjoy a variety of recreational activities.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

As with Alternative B, the direct and indirect effects of noxious weeds would be avoided. Permanent and seasonal residents, recreationists and visitors to the Priest Lake country would continue to use National Forest lands for a variety of activities.

Noxious weeds are most prevalent along disturbed areas immediately adjacent to roads on cut and fill slopes as well as ditches. These areas do not normally have huckleberry bushes, mushrooms, or other berries because of their disturbed condition or competition with noxious weeds. Berry-pickers or mushroom-pickers typically do not harvest forest products adjacent to roads because of the lack of bushes or mushrooms and also the more dusty conditions. Therefore, there would be little direct effect to these activities if Alternative C is implemented. The herbicides which are specified in the description of Alternative C also would not cause a loss of huckleberry bushes, mushrooms, or other native vegetation.

However, there would be an indirect effect to such activities. Individuals may choose to shift to other areas during the time of implementation because of a perceived health risk. As stated in the description of Alternative C, guidelines in the application of herbicides would include restrictions concerning windspeed, distance from water, etc. to prevent any health risk. The areas of treatment would also be publicized.

There would be a direct effect of closing campgrounds or dispersed campsites during the time of herbicide application. These closures would be short-term and would follow the guidelines as specified in Alternative C concerning human health risk. This would result in a short-term shift to other recreational areas during the period of operations.

There would be no direct or indirect effect for other activities such as snowmobiling, cross-country skiing, hunting, or firewood gathering because these activities would occur outside the time-period of application.

As with Alternative B, there would be disturbance associated with implementation of the alternative. Compared to Alternative B, this disturbance would be short-term and would not require as large a workforce. The duration of disturbance therefore would be reduced.

Cumulatively, there would be short-term effects to the lifestyles of residents and recreationists. Because the treatment sites are scattered throughout the Priest Lake Ranger District, there would continue to be the broad spectrum of existing recreational activities across the District.

Consistency with the Forest Plan

These alternatives would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Land-Use Patterns

Alternative A: No Action

The No Action Alternative would have no opportunity for cooperative weed programs with local, state, or other agencies, private landowners or groups. The Priest Lake Ranger District would not comply with local and state laws governing noxious weed control as weeds on National Forest lands would be left untreated.

No change in management area designations would occur as a result of the selection of the No Action Alternative. However, the resource values for various management areas would be altered through time. Weeds would increase in all Management Areas (MAs) including those MAs dedicated to Wild and Scenic Rivers, Resource Natural Areas, Natural History Areas, Wilderness, etc. The infestation of noxious weeds would continue to be heaviest in those Management Areas which include timber harvesting and where human presence is the greatest, such as developed recreation sites.

Noxious weeds would continue to spread unto private lands from infestations on adjacent National Forest lands. Those private landowners who continue to treat noxious weeds on their lands would continue to incur expenses from invading weeds on adjacent federal lands.

There would be no opportunity to treat those lands under easement or other special use designation. Rights-of-way such as utility corridors and state and county road corridors would continue to be major areas of weed infestation.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural, and Biological Treatment
and Alternative C: Manual, Cultural, Biological and Chemical Treatment

There would be similar effects for both alternatives on land uses. Both alternatives would be consistent with local and state regulations to control noxious weeds. Cooperative efforts would be initiated with the three counties and two state(s) on projects as well as permittees or other private groups and individuals.

There would be no direct effect to land-use allocations on National Forest lands for either alternative. However, resource values for various management areas would be maintained in either alternative. The duration of noxious weed control would be different between the action alternatives; Alternative C would accomplish noxious weed control on the proposed sites within 3 years. Past monitoring has shown that manual control requires repeated treatment over a longer period.

Consistency with the Forest Plan

These alternatives would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Attitudes, Beliefs, and Values

Alternative A: No Action

There would be no change from existing conflicting attitudes, beliefs, and values. Several segments of forest users and private landowners would continue to feel strongly concerning the need for control of noxious weeds. These individuals would view the presence of noxious weeds as evidence of negative human impact and negligence in the stewardship of natural resources. If the No Action Alternative were chosen, the Forest Service would not be in compliance with those state and local laws governing noxious weed control. Others would believe that exotic noxious weeds are a part of the landscape.

There would be no financial cost associated with Alternative A. In the future, the costs of treatment would be higher because of the continued rapid spread of noxious weeds. As these weeds spread, there would be increased awareness of the negative effects of noxious weeds on other resources.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative B: Manual, Cultural, and Biological Treatment

This alternative would be supported by individuals who do not support the use of herbicides on federal lands. Some recreationists such as berry-pickers and mushroom-pickers would prefer this alternative because of concern over the effect of herbicides. Some landowners adjacent to federal lands also would support Alternative B because there would be no effect on their land because of herbicides.

This alternative would be in compliance with state and local laws regarding noxious weed control.

The high cost of Alternative B as shown in Appendix E would result in negative opinions concerning its implementation. Because of reduced federal budgets, there would be concern that dollars would not be available to implement Alternative B. Without full funding of Alternative B, noxious weeds would continue to spread on the Priest Lake Ranger District.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Alternative C: Manual, Cultural, Biological and Chemical Treatment

Alternative C would also be in compliance with state and local laws concerning noxious weeds. This alternative would be supported by individuals wanting a comprehensive treatment of noxious weeds including herbicide, biological, manual and cultural treatments. Those individuals who are directly affected by noxious weeds, such as ranchers and some private landowners, also would support this alternative. Some adjacent landowners would prefer this alternative because of its comprehensive treatment.

The treatment cost would be considerably lower than Alternative B because of greatly reduced payroll costs. This lower treatment cost would be important to individuals concerned about high costs of federal programs.

Consistency with Forest Plan

This alternative would be consistent with the Land and Resource Management Plan (Forest Plan) for the Idaho Panhandle National Forests.

Probable Environmental Effects that Cannot be Avoided

The application of herbicides brings with it the likelihood of some environmental impacts that cannot be avoided. These have been discussed above and would primarily involve non-target plants. Although alternative design criteria would probably prevent environmentally significant concentrations of herbicide from reaching surface water or groundwater, it is possible that minute amounts of herbicide will migrate from the site. Under reasonably foreseeable circumstances this would not have a significant environmental impact.

The adoption of the no-action alternative or any of the non-chemical alternatives would not immediately result in unavoidable environmental impacts. However, it is clear that alternatives which allow the continued spread of noxious weeds would eventually result in unavoidable environmental effects. Although the infestations are containable now and could theoretically be eliminated at any time in the future, after infestations reach a "critical mass" they are uncontrollable in any practical sense. This situation is well-illustrated by the knapweed infestations in many areas of northern Idaho. At the "point of no return," the adverse environmental impacts outlined above for the no-action alternative would be unavoidable.

Possible Conflicts with Planning and Policies of Other Jurisdictions

The Idaho and Washington noxious weed laws direct the county control authorities to make all reasonable efforts to develop and implement a noxious weed program.

The lack of weed control under the no-action alternative would conflict with these state and county weed control plans and policies. The other alternatives would indicate that the Forest Service is serious about doing something about the "weed problem."

None of the alternatives would conflict with state and federal water or air quality regulations or with U.S. Fish and Wildlife Service recovery plans for threatened and endangered species. A biological assessment of the possible impacts of the preferred alternatives on threatened and endangered species will be completed for the FEIS.

The Relationship Between Short-term Uses and Long-term Productivity

None of the alternatives would involve the short-term use of commodity-type resources. Some might argue, however, that the impact of herbicide spraying on non-target plant species constitutes a short-term use of the resource.

As discussed above, the more effective an alternative is at controlling the spread of noxious weeds, the better that alternative is at protecting the natural resources of this area despite the possible short-term impacts on the environment.

Irreversible and Irretrievable Commitment of Resources

All of the alternatives that involve active control measures would involve an irretrievable commitment of labor, fossil fuels, and economic resources. The no-action alternative would not involve such commitments, but it could result in the unavoidable deterioration of the natural condition of the area. The no-action alternative would likely irretrievably change the existing plant community diversity.

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CHAPTER V
Preparers/Literature Cited/Mailing List

CHAPTER V
Preparers/Literature Cited/Mailing List

The following individuals are members of the interdisciplinary team for the Noxious Weed Control Project Enviromental Impact Statement. Areas of responsibility are listed for each team member.

DAVID ASLESON — Planning Team Leader
Education: B.S. History, Moorhead State University
M.A. Geography, University of Wyoming
M.A. Forestry, University of Idaho
Responsibility: Team Leader for all NEPA compliance on district. Conducted the social analysis and prepared the documentation for this resource.

MATTHEW BUTLER — Wildlife Technician
Education: B.S. Wildlife Biology, Colorado State University
Licensed Limited Applicator in ID and Licensed Public Operator in WA for pesticide application.
Responsibility: Compiled information on noxious weed infestation and past treatment programs. Conducted effects analysis for Human Health. Provided technical assistance to other team members concerning herbicide characteristics and noxious weed control.

ALAN DOHMEN — Fisheries Biologist
Education: B.S. Wildlife Science, Oregon State University
Responsibility: Completed analysis of effects on the fisheries resource, and prepared the documentation for fisheries.

JILL COBB — Hydrologist
Education: M.S. Watershed Management, Humboldt State University
Responsibility: Conducted analysis of effects on the watershed resource, and prepared the documentation for the water resources.

TIM LAYSER — Wildlife Biologist
Education: B.S. Wildlife Biology, Washington State University
M.S. Environmental Science, Biological Sciences, Washington State University
Responsibility: Conducted analysis of effects on wildlife habitat including threatened, endangered and sensitive species; plants, management indicator species, cavity-nesting habitat, noxious weeds and range. Prepared the documentation for these resources.

MARIDEL MERRITT — Writer/Editor
Education: B.S. Agriculture/Animal Industries, University of Idaho
Responsibility: NEPA compliance, final editing and writing; document layout and preparation for printing.

DIANE PENNY — Botanist

Education: B.S. Environmental Studies, College of Environmental Science and Forestry

Responsibility: Analyzed the effects on sensitive plants and prepared the documentation for this resource.

ROGER STEERMAN — Fuel Managment Officer

Responsibility: EIS Team Leader

JUDY YORK — Information Assistant

Education: B.S. Wildlife Ecology, M.S. Natural Resources Communication; University of Idaho

Responsibility: EIS Team Leader, Public Involvement planning and coordination

The following individuals provided technical or other support to the analysis:

NAME	AREA OF EXPERTISE	AREA OF CONTRIBUTION
Suzanne Audet	Wildlife Habitat	T&E Habitat Management
Debbie Butler	Recreation	Visual Resources
Camilla Cary	Clerical	Preparation for Printing
Christine Cary	English/Communications	Content Analysis
Barry Dumaw	Weed Surveying	Noxious Weed Inventory
Cindy Friers	Weed Surveying	Noxious Weed Inventory
Dean Geiser	Vegetation Management	Herbicide Advice
Tory Grussling	Vegetation Management	Noxious Weed Control
Betsy Hammet	Botany	Sensitive Plants
Molly Hansen	Transportation Planning	Road Mapping
Paul Harrington	Wildlife Habitat	Wildlife Habitat
Glenn Heitz	Weed Surveying	Noxious Weed Inventory
Virginia Heyl	Weed Surveying	Noxious Weed Inventory
Sandy Jacobson	Wildlife Habitat	Wildlife Habitat
Bob Klarich	Vegetation Management	Noxious Weed Control
Larry Lair	Vegetation Management	Noxious Weed Control
Richard Metz	Vegetation Management	Noxious Weed Control
Brad Mingay	GIS	Mapping
Ed Monnig	Environmental Chemistry	Human Health and Herbicides
Glen Palfrey	Weed Surveying	Noxious Weed Inventory
Carrie Poquette	Weed Surveying	Noxious Weed Inventory
Sharon Sorbey	Vegetation Management	Noxious Weed Control
Debbie Wilkins	Recreation	Social Analysis Input
Mike Wolever	Northern Lights	Vegetation Management

Callihan, R.H., J.P. McCaffrey, and V.J. Parker-Clark, 1991. Leafy Spurge Biology and Management. Current Information Series No. 877. University of Idaho College of Agriculture Cooperative Extension System. Moscow, Idaho.

Cook, Kevin J. 1991 Wildlife and Weeds. Colorado Outdoors. May/June 1991. pages 10-14.

Grussling, Tory. 1996. Personal communication between Matthew Butler and Tory Grussling, Acting Bonner County Weed Supervisor, Sandpoint, Idaho.

Monnig, E. 1988. Human Health Risk Assessment for Herbicide Applications to Control Noxious Weeds and Poisonous Plants in the Northern Region. FPM Report 88-9. USDA Forest Service. Missoula, Montana.

Mullison, W.R., 1985. A Toxicological and Environmental Review of Picloram *in* 38th Annual Meeting of the Western Society of Weed Science, Phoenix Arizona.

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Sorbey, Sharon. 1996. Personal communication between Matthew Butler and Sharon Sorbey, Pend Oreille County Noxious Weed Control Board Coordinator, Newport, Washington.

USDA Forest Service, 1992. Risk Assessment for Herbicide Use in Forest Service Regions 1, 2, 3, 4, and 10 and on Bonneville Power Administration Sites. FS 53-3187-9-30.

Vallentine, J.F. 1989. Range Development and Improvements. Academic Press Inc., San Diego, California. 524 p.

Whitson, T.D., (Ed.), 1992. Weeds of the West. The Western Society of Weed Science, Newark, California. 630 p.

The following agencies, organizations and individuals have been sent a copy of the Draft Environmental Impact Statement:

Government Agencies

Environmental Protection Agency
Washington D.C.
Environmental Protection Agency
Seattle
Environmental Coordination
Chief , 1950)
USDA-National Agricultural
Library
Office of Environmental Affairs
Depart of the Interior
USDA Forest Service, Planning Staff
Idaho Panhandle National Forests
Idaho Dept of Fish & Game
Charles Corsi, Regional Office
Washington State Department of Ecology
Division of Environmental Quality
Glen Rothrock
U.S. Fish and Wildlife Service
Bonner County Commissioners
Wayne Newcomb
Noxious Weed Control Pend Oreille
Sharon Sorby

Public Interest Groups, Organizations, Businesses and Individiuals

Alliance for the Wild Rockies
Jennifer Fernstein
City of Priest River Library
Coeur d'Alene Tribal Headquarters
Chuck Finan
Ecology Center
Jeff Juel
Forest Watch Program
Barry Rosenberg
Idaho Native Plant Society
Inland Empire Public Lands Council
John Osborn, M.D.
Inland Empire Public Lands Council
Liz Sedler
Kalispell Tribal Office
Glen Nenema
Kootenai Tribe of Idaho
Velma Bahe
Newport Library
Northern Lights
Mike Wolover
Panhandle Backcountry Horsemen
Dr. Gregg Parsons
Priest Lake Library
Sandpoint Library
Spokane Spray Service Inc.
Larry Lair
Washaho Ranch
Bill Egolf
Welch, Comer & Assoc.
Steve Cordes

News Media

Mike Brown, KPND/KSPT Radio News
Roy Broun, Coolin Newsletter

Individuals

Dohmen, Alan
Geddie, John
Gindraux, Juels
Hirabayashi, Joanne
Lowe, Ethel M.
McInerney, Dick
Raine, Austin
Richardson, Don
Sivas, Debbie
Soumas, Rob
Tibbetts, Sharon
White, Mike and Mary

APPENDIX A

SPILL PLAN

The following equipment will be available with vehicles or pack animals used to transport pesticides and in the immediate vicinity of all spray operations.

1. A shovel
2. A broom (except backcountry operations)
3. 10 pounds of absorbent material or the equivalent in absorbent pillows.
4. A box of large plastic garbage bags.
5. Rubber gloves
6. Safety goggles
7. Protective overalls
8. Rubber boots

The appropriate Material Safety Data Sheets will be reviewed with all personnel involved in the handling of pesticides.

The following material from the U.S. EPA document entitled *Applying Pesticides Correctly: A Guide for Private and Commercial Applicators* will be reviewed with all personnel involved in handling pesticides.

CLEAN UP OF PESTICIDE SPILLS

Minor Spills

Keep people away from spilled chemicals. Rope off the area and flag it to warn people. Do not leave unless someone is there to confine the spill and warn of the danger. If the pesticide was spilled on anyone, wash it off immediately.

Confine the spill. If it starts to spread, dike it up with sand or soil. Use absorbent material such as soil, sawdust, or an absorbent clay to soak up the spill. Shovel all contaminated material into a leakproof container for disposal. Dispose of it as you would excess pesticides. Do not hose down the area, because this spreads the chemical. Always work carefully and do not hurry.

Do not let anyone enter the area until the spill is completely cleaned up.

Major Spills

The cleanup of a major spill may be too difficult for you to handle, or you may not be sure of what to do. In either case, keep people away, give first aid if needed, and confine the spill. Then call Chemtrec, the local fire department, and State pesticide authorities for help.

Chemtrec stands for Chemical Transportation Emergency Center, a public service of the Manufacturing Chemicals Association. Its offices are located in Washington, D.C. Chemtrec provides immediate advice for those at the scene of emergencies.

Chemtrec operates 24 hours a day, seven days a week, to receive calls for emergency assistance. For help in chemical emergencies involving spills, leaks, fire, or explosions, call toll-free 800-424-9300 day or night. This number is for emergencies only.

If a major pesticide spill occurs on a highway, have someone call the highway patrol or the sheriff for help. (Carry these phone numbers with you.) Do not leave until responsible help arrives.

In addition the section from the *Northern Region Emergency and Disaster Plan* entitled "Hazardous Materials Releases and Oil Spills" will be reviewed with all appropriate personnel (see following pages). Notification and reporting requirements as outlined in this section will be followed in the unlikely event of a serious spill.

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS

(Excerpted from the *Northern Region Emergency and Disaster Plan*)

AUTHORITY: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and Superfund Amendments and Reauthorization Act of 1986 (SARA). Other statutes that may apply include Resource Conservation and Recovery Act (RCRA); Hazardous and Solid Waste Amendments (HSWA); Toxic Substances Control Act (TSCA); Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Clean Water Act (CWA); and Clean Air Act (CAA).

DEFINITION: A hazardous materials emergency or oil spill is defined as any release or threat of release of a hazardous substance or petroleum product that presents an imminent and substantial risk of injury to health or the environment.

A release is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.

Releases that do not constitute an immediate threat, occur entirely within the work place, are federally permitted, or are a routine pesticide application, are not considered to be an emergency and are not covered by this direction.

RESPONSIBILITY:The first person who knows of a release and is capable of appreciating the significance of that release has the responsibility to report the release.

Only emergency release response and reporting is covered by this direction. Non-emergency reporting will be accomplished by appropriate RO staff specialists who should be notified directly of all non-emergency releases.

An emergency release of a hazardous substance or petroleum product may be from a Forest Service operation or facility; from an operation on National Forest land by a permit holder, contractor, or other third party; or from a transportation related vehicle, boat, pipeline, aircraft, etc., crossing over, on, or under Forest lands. Response and/or reporting by Forest Service employees will differ in each situation:

1. If the release is from a Forest Service facility or operation, the Forest Service and its employee(s) is clearly the "person in charge," and is fully responsible for all reporting. Immediate response action is limited to that outlined in emergency plans and only to the extent that personal safety is not threatened.

2. If the release is from a third party operation, the Forest Service will only respond and/or report the emergency if the third party fails to take appropriate action.

3. If the release is from a transportation related incident, the Forest Service will only respond and/or report the emergency if the driver or other responsible party is unable or fails to take appropriate action.

RESPONSE ACTION GUIDE: THE PRIMARY RESPONSIBILITY OF ANY FOREST EMPLOYEE(S) ENCOUNTERING A HAZARDOUS MATERIALS EMERGENCY OR OIL SPILL IS COMPLETE AND ACCURATE REPORTING TO APPROPRIATE AUTHORITIES IN A TIMELY MANNER.

Forest Service employee(s) will not assume an incident command role for any hazardous materials emergency or oil spill, but may provide support services as directed by an authorized Federal On-Scene Coordinator (OSC) or other State or local authorized authority.

Within the limits of personal safety, common sense, and recognition of the dangers associated with any hazardous materials emergency or oil spill, Forest Service employee(s) may provide necessary and immediate response actions until an authorized OSC or other authority can take charge. These actions may include:

- Public warning and crowd control.
- Retrieval of appropriate information for reporting purposes.

Additionally, and only after verification of the type of hazardous material involved and its associated hazards, a Forest Service employee(s) may also take actions including:

- Rescue of persons in imminent danger.
- Limited action to mitigate the consequences of the emergency.

Under no condition shall a Forest Service employee(s):

- Place themselves or others in imminent danger.
- Perform or direct actions that will incur liability for the Forest Service.

IF THERE IS ANY QUESTION THAT THE EMERGENCY MAY CONSTITUTE A THREAT TO PERSONAL SAFETY, LIMIT YOUR RESPONSE TO PUBLIC WARNING AND REPORTING OF THE INCIDENT.

PRECAUTIONS: When approaching the scene of an accident involving any cargo, or other known or suspected hazardous materials emergency including oil spills:

Approach incident from an upwind direction, if possible.

Move and keep people away from the incident scene.

Do not walk into or touch any spilled material.

Avoid inhaling fumes, smoke, and vapors even if no hazardous materials are involved.

Do not assume that gases or vapors are harmless because of lack of smell.

Do not smoke, and remove all ignition sources.

ORGANIZATIONS FOR EMERGENCY AND TECHNICAL ASSISTANCE:

CHEMTREC - Chemical Transportation Emergency Center - 800-424-9300 (24 hour) (For assistance in any transportation emergency involving chemicals.)

Rocky Mountain Poison Control Center - 800-525-5042 (24 hour)
303-629-1123 (24 hour)

National Agricultural Chemicals Association - 202-296-1585
(For pesticide technical assistance and information referral.)

Bureau of Explosives - 202-293-4048
(For explosives technical assistance.)

Centers for Disease Control - 404-633-5313
(For technical assistance regarding etiologic agents.)

EPA Region 8 (MT, ND, SD)
Emergency Response Branch - 303-293-1723; FTS 564-1723

EPA Region 10 (Idaho)
Superfund Removal and Invest Section - 206-442-1196; FTS 399-1196

Montana Department of Health and Environmental Sciences (24 Hour) 406-444-6911
Water Quality Bureau - 406-444-2406
Solid Waste Management Bureau - 406-444-2821

North Dakota State Health Department
Environmental Engineering - 701-224-2348
Hazardous Waste Division - 701-224-2366
Radiological Hazardous Substances - 701-224-2348

South Dakota Division of Environmental Quality
Office of Water Quality - 605-773-3296
Office of Solid Waste Management - 605-773-5047

Idaho Department of Health and Welfare
Water Quality Bureau - 208-334-5867
Solid Waste Bureau - 208-334-5879

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- CONTACT LIST AND IMMEDIATE ACTION GUIDE

INDIVIDUAL

Actions	Contacts
Do not expose yourself or others to any unknown material. a. Do not attempt rescue or mitigation until material has been identified and hazards and precautions noted. b. Warn others and keep people away. c. Approach only from upwind. d. Do not walk in or touch material. e. Avoid inhaling fumes and vapors. f. Do not smoke, and remove ignition sources.	District Dispatcher or Ranger
Report the incident. Complete "Reporting Action Guide" within reasonable limits of exposure and timeliness, and report information to District/Forest Dispatcher.	
If there is any question that incident is a threat to personal safety, limit response to public warnings and reporting.	

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- **CONTACT LIST AND IMMEDIATE ACTION GUIDE**

DISTRICT

Actions	Contacts
Insure reporting individual is aware of hazards associated with incident.	Forest Dispatcher
Obtain as much information as possible, complete a copy of the "Reporting Action Guide," and relay all information to Forest Dispatcher.	
For fixed facilities, verify if possible, whether or not an emergency guide, Spill Prevention Control and Countermeasure Plan, or similar response plan is available for the specific emergency. If so, implement the response actions as indicated.	
Dispatch additional help, communications systems, etc., to incident scene if incident is on National Forest land or is caused by Forest Service activity or facility. Otherwise support as requested by official in charge.	
If there is any question that incident is a threat to personal safety, limit response to public warning and reporting.	

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- CONTACT LIST AND IMMEDIATE ACTION GUIDE

FOREST

Actions	Contacts
Immediately contact the Forest Hazardous Materials Incident Coordinator who will take the following actions: a. Determine if incident is true emergency. b. Determine who is responsible party for incident, and whether appropriate actions and reporting have been accomplished. c. From available information, determine hazards and precautions, if possible, and relay further instructions to reporting individual through the District. d. Initiate appropriate local reporting actions, and coordinate responses with District. e. Arrange Forest support for on-scene coordinator and/or local emergency response officials as requested.	Forest Hazardous Materials Incident Coordinator who will determine extent of emergency. If incident is determined reportable, contact: a. National Response Center (X9). b. EPA Hazmat emergency response (X3). c. Regional Incident Dispatcher (1). d. County sheriff and/or county disaster and emergency services coordinator. e. State Emergency and Disaster organizations (X12, X15, X17, X21) f. North Dakota State Fire Marshal for oil spills in North Dakota only (X19). g. Internal Forest contacts.
Make appropriate local emergency contacts as directed by Forest Hazardous Materials Incident Coordinator.	
Relay information from Forest Hazardous Materials Incident Coordinator back to District and up to Regional Office as appropriate.	

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- CONTACT LIST AND IMMEDIATE ACTION GUIDE

REGIONAL INCIDENT DISPATCHER

Actions	Contacts
Immediately contact the Regional Hazardous Materials Incident Coordinator who will take the following actions: a. Personally work with Forest Hazardous Materials Incident Coordinator to determine extent of the emergency. If incident is reportable, implement the following actions: (1) By Data General (DG) mailing list notify: Regional Forester, Deputy Regional Foresters, Staff Directors, Attorney-In-Charge (OGC). (2) Contact other RO specialists, other Agency personnel, etc., as necessary to determine scope of problem and appropriate actions. RO specialist contacts include: (a) Regional Watershed Coordinator (if incident involves streams, lakes, rivers, etc.) (2) (b) Regional Reclamation Officer (if incident involves mining) (12) (c) Regional Safety and Health Program Manager (6) (d) Regional Cooperative Forestry and Pest Management (if pesticide related) (13) (3) Arrange Regional support for on-scene coordinator and/or local emergency response officials as requested. (4) Arrange a Regional investigation/followup team if determined to be necessary. (5) Keep Regional Forester, Staff Directors, and OGC advised of situation via routine DG updates.	Regional Hazardous Materials Incident Coordinator (11)
	Regional Emergency Coordinator (4)
	If incident is determined to be reportable, verify that National Response Center and appropriate Federal, State, and local contacts have been made.
	WO Engineering (Environmental Health) (W3)
	WO Personnel Management (Safety and Health) (W4)

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- CHECKLIST

HAZARDOUS MATERIALS AND OIL SPILLS REPORTING ACTION GUIDE

Although reporting requirements vary depending on the type of incident, the responsibility of the employee(s) in the field is limited to collecting appropriate information and relaying it to the proper level of the organization in a timely manner. Following is a list of the information that should be collected, if possible; however, **it is more important to maintain personal safety and report in a timely manner than to collect all information.**

1. Date:

Time of release:
Time discovered:
Time reported:
Duration of release:

2. Location:(Include State, county, route, milepost, etc.)

3. Chemical name:

Chemical identification number:
Other chemical data:

NOTE: For transportation related incidents, this information may be available from the driver, placards on the vehicle, and/or shipping papers.

4. Known health risks:

5. Appropriate precautions if known:

6. Source and cause of release:

7. Estimate of quantity released:____________________________gallons
Quantity reaching water:________________________________gallons
Name of affected watercourse:

8. Number and type of injuries:

9. Potential future threat to health or environment:

10. Your name:
Phone number for duration of emergency:
Permanent phone number: FTS____________ Commercial____________________

For transportation related incidents, also report:

11. Name and address of carrier:

12. Railcar or truck number:

If there is any doubt whether an incident is a true emergency, or whether reportable quantities of hazardous materials or petroleum products are involved, or whether a responsible party has already reported the incident, always report the incident.

PROCEDURES FOR MIXING, LOADING, AND DISPOSAL OF PESTICIDES

The following measures will apply to all pesticide applications.

1. All mixing of pesticides will occur at least 100 feet from surface waters or well heads.

2. Dilution water will be added to the spray container prior to addition of the spray concentrate.

3. All hoses used to add dilution water to spray containers will be equipped with a device to prevent back-siphoning.

4. Applicators will mix only those quantities of pesticides that can be reasonably used in a day.

5. During mixing, mixers will wear a hard hat, goggles or face shield, rubber gloves, rubber boots, and protective overalls.

6. All empty containers will be triple rinsed and rinsate disposed of by spraying near the application site at rates that do not exceed those on the spray site.

7. All unused pesticide will be stored in a locked building in accord with pesticide storage regulations contained in Forest Service Handbook 2109.13.

8. All empty and rinsed pesticide containers will be punctured and either burned or disposed of in a sanitary landfill.

APPENDIX B

[illegible] FOR [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

NOXIOUS WEED TREATMENT

APPLICATION GUIDELINES

GENERAL APPLICATION

Applied when wind speeds less than 6 miles per hour
Generally herbicide would not be applied if precipitation is expected with 4 to 6 hours.
Herbicide would be applied by or application would be supervised by state licensed applicator.
The treatment areas which are of special concern such as campgrounds, important huckleberry picking areas, would be posted prior to treatment and immediately following treatment with herbicide.
Within areas with coarse sandy soils, the herbicide Picloram would not be used.

RIPARIAN AND WETLAND HABITATS

Areas within 150 feet of surface water.
Method of control would hand spray using power equipment
Glyphosate, or 2,4-D would be preferred herbicides used, depends on site conditions. Picloram or clopyralid would not be used.
Winds speeds less than 5 miles per nour.
No herbicide would be applied within 10 feet of live water.

FLOODPLAINS

Areas within 50 feet of live water.
Preferred method of control is manual or hand spray.
Wind speeds less than 8 miles per hour.
No herbicides would be applied within 10 feet of live water.
Glyphosate and 2,4-D would be preferred herbicide used, depends on site conditions. Picloram or clopyralid would not be used.

UNIQUE VEGETATION (Sensitive Plants)

No vehicle based application would occur within 50 from known sensitive plant locations.
Within 50 feet of known location of sensitive plants the preferred method of noxious weed control will be manual or hand spray.
Hand spray would not occur with wind speeds greater than 5 miles per hour.
Preferred herbicides used would be Clopyralid, Clopyraild/2,4-D or Glyphosate. Picloram or 24-D(alone) would be used.

PLANTATIONS (Conifer)

Preferred method of control would be manual, hand spray or hand spray with power equipment.
No power boom equipment would be used.
Preferred herbicides would be Clopyralid and Clopyralid/2,4-D. No Picloram would be used.
Wind speeds would be less than 5 miles per hour.

APPENDIX C

HARVARD UNIVERSITY
SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF HEALTH POLICY AND MANAGEMENT
(617) 732-1090

677 Huntington Avenue
Boston, Massachusetts 02115

February 1, 1990

Dr. Richard E. Stuckey
Director
The National Association
of Wheat Growers Foundation
415 Second Street, N.E.
Suite 300
Washington, DC 20002

Dear Dr. Stuckey:

In response to your request for an independent review of the evidence on 2,4-D and cancer, I have the pleasure of transmitting to you the final report of the workshop held October 17-19, 1989. The report considers both the toxicological (animal) and epidemiological (human) evidence.

The toxicology data by itself provides little reason to expect that 2,4-D causes cancer in people. Experimental studies have shown an excess of brain tumors in male rats at the highest levels of exposure but not in female rats or mice of either gender. Further research is necessary to generate reliable data on the effects of high doses ingested by male rats. If 2,4-D is ultimately shown to be an animal carcinogen, it is unlikely to be a very potent one.

Weighing the epidemiological evidence, the workshop concluded that a cause-and-effect relationship between 2,4-D and cancer is far from being established. The results of two studies conducted by the same research team suggest an association between the occupational use of 2,4-D and non-Hodgkin's lymphoma. However, the workshop participants felt this association needs to be interpreted cautiously, first, because other studies have not shown the same results and second, because some factor other that 2,4-D might be involved. Additional epidemiological studies already underway in the United States, Canada, New Zealand and Sweden will address this question.

Based on all available evidence, the panelists were asked to assess how likely it is that exposure to 2,4-D is capable of causing cancer in people. None of the panelists felt that the evidence was strong enough to conclude that 2,4-D is either a known or probable cause of cancer. Of the 13 panelists, 11 felt it is possible that exposure to 2,4-D can cause cancer in humans, though not all of them felt the possibility was equally likely: one thought the possibility was relatively strong, leaning toward probable; and five thought the possibility was relatively remote, leaning toward unlikely. A minority of two participants felt it was unlikely that 2,4-D can cause cancer in people. Several members felt that the evidence was barely adequate to support any conclusion. (The panel stressed that it used the terms "probable" and "possible" in their ordinary sense and not as reference to specific carcinogen classification categories used by any regulatory agency.)

As a means of resolving these issues, workshop participants stressed the need for future studies to develop more reliable and precise estimates of 2,4-D exposure and to distinguish more clearly between 2,4-D and other agents in the collection and analysis of data and the reporting of results.

In closing, I would like to recognize the distinguished panel of workshop participants and project staff for their thorough, expert evaluation of the complex body of scientific literature on this widely-used product.

Yours sincerely,

John D. Graham

John D. Graham, Ph.D.
Director
Program on Risk Analysis and Environmental Health

APPENDIX D

Administrative Use Guidelines

RECOMMENDATIONS FOR EVALUATING DISTURBANCE FACTORS
FOR ASSESSING CUMULATIVE EFFECTS ON GRIZZLY BEAR
2/93 REVISION

IDAHO PANHANDLE NATIONAL FORESTS - 2/93

After one season's application of the 5/92 recommendations for evaluating disturbance factors, a review of the recommendations was conducted on February 3, 1993. As a result of this review of the application of the recommendations over the past year, some clarification and modification appears necessary to better meet the needs of the bear while accommodating human activities as much as possible. As with the original recommendations, guidelines are intended to provide guidance in completing biological assessments/evaluations, but must be tempered with professional judgement that will best meet the security needs of the bear.

There are two primary concerns with disturbance of grizzly bears. First is the displacement of bears from otherwise useable habitat resulting in reduced carrying capacity. Second, the habituation of bears to humans and human disturbance, thus leading to increased poaching or accidental shooting, or to the removal of bears that become "problem" bears.

As a guide for the IPNF the following security reduction calculations are recommended for biological evaluations and assessments:

1. LOW LEVEL "ADMINISTRATIVE" USE. 14 days of activity per road per bear year is considered acceptable disturbance. This can be compressed into 14 consecutive days, or 1 day/ week. The type of access/disturbance associated with this recommendation includes administrative use and other low level activities that do not include motorized equipment (ie chainsaws, etc). Once the 14 days of use has occurred, no more use of any kind is permitted for the year.

This would also apply to motorized use of trails. Motorized use includes ALL motorized (vehicle) use, including "administrative use," research, enforcement activities and the like. Considerations for Use Permits will be included in calculations for security reductions. Once a closed road is considered a disturbance, every effort should be made to regain the security, even though for calculations purposes it is considered open.

2. HIGH LEVEL EQUIPMENT USE. Up to 15 days use/year permitted at any level of disturbance for each bear unit. This will be limited to a maximum of a 3-week period, and can occur once/year in each bear management unit.

3. TRAIL USE. Deductions for heavy use trails should be taken on a case by case basis as appropriate. The Cumulative Effects Model uses a guideline of heavy use as greater than 20 parties/week of non-motorized use should result in a security deduction of approximately 1/5 mile wide linear corridor along trails. A party is considered a group of 4 or less and separated by 4 hours (ROIE handbook). livestock (horses, llamas) should be considered in calculating party size. 14 days of consecutive use in excess of 20 parties/week would be permitted one time annually for each bear unit. Until we are able to better monitor trail use numbers, districts will need to apply some level of judgement as to heavy use trails. Special use permits should also be included in security calculations.

4. CONCENTRATED RECREATION SITES. Greater than 20 parties/week at non-motorized recreational concentration areas should have a security deduction of 1/4 mile. The 14-day consecutive or compressed disturbance would be permitted.

5. SECURITY RECOVERY. In calculating disturbance or security deductions for grizzly bear, there is usually a residual disturbance effect. In other words, if a bear is displaced from an area for a period of time due to major disturbances over a long term (3 or more years) recolonizianton or use of an area is delayed. For activities that extend for over three years, an additional year of security deduction should be made. For activities that extend over seven years, the security deduction should continue for an additional three years.

APPENDIX D
Grizzly Bear Road Closure Effectiveness Monitoring

DISTRICT: Priest Lake Ranger District

PROJECT NAME: Grizzly Bear Road Closure Monitoring

SITE LOCATION: District Wide

MONITORING OBJECTIVE: To determine effectiveness of road closures (gates, barriers, earthen barriers and obliteration) in providing security habitat for grizzly bears.

PRIORITY: High, Essential

PARAMETERS: Unscheduled and unauthorized entries behind closure points.

METHODOLOGY:

Each road closure point will be visited no less than once every two weeks to check for closure condition and utility. Closure points such as gates, and guardrail barriers will be visited. Electronic road counters will be installed on a portion of the closures to determine the effectiveness of each closure type.

FREQUENCY/DURATION: One a week each year from March 15 to November 15.
(depending upon snow conditions)

DATA STORAGE District.

REPORT: Each year following monitoring period.

PROJECTED COSTS: $3,000 each monitoring period.

PERSONNEL NEEDED: Wildlife Biologist, (2) Wildlife Technicians

RESPONSIBLE INDIVIDUAL: District Wildlife Biologist

PREPARED BY: Tim Layser, District Wildlife Biologist

DATE: May 11, 1995

APPENDIX E

APPENDIX E

COST ESTIMATES BY ALTERNATIVES

Alternative B, First Year

Manual Control
314.95 acres of treatment
(0.1 acres of control per person per day)
$120 per day (includes vehicle costs)
315 acre x 0.1 acres of treatment per day per person x $120 per day

= $378,000
= 3,150 days work
35 persons (90 days)

Biological Control
63 acres of treatment
Insects St. Johnswort = $3,000
Insects Knapweed = $1,980

Cultural Control
17.04 acres of treatment
201 acres of treatment
mowing at rate of 1 acre per hour at a rate of $25 per hour
201 acres x $25 = $5,025

Total First Year = $388,005.

Alternative B, Second Year

Manual Control
284 acres of treatment
(0.1 acres of control per person per day)
$120 per day (includes vehicle costs)
4% annual increase
284 acres x 0.1 acres of treatment per day per person x $120 per day x 4%
= $354,432
= 2,840 days work
= 31 persons (90 days)

Biological Control
63 acres of treatment
Insects St. Johnswort = $3,000

Insects Knapweed = $1,980

Cultural Control
17.04 acres of treatment
201 acres of treatment
mowing at rate of 1 acre per hour at a rate of $25 per hour
201 acres x $25 = $5,025

Total Second Year = $364,437

Alternative B, Third Year

Manual Control
284 acres of treatment
(0.1 acres of control per person per day)
$120 per day (includes vehicle costs)
4% annual increase
284 acres x 0.1 acres of treatment per day per person x $120 per day x 4% x 4%
= $368,064
2,840 days work
31 persons (90 days)

Biological Control
63 acres of treatment
Insects St. Johnswort = $3,000
Insects Knapweed = $1,980

Cultural Control
17.04 acres of treatment
201 acres of treatment
mowing at rate of 1 acre per hour at a rate of $25 per hour
201 acres x $25 = $5025

Total Third Year = $378,069

Alternative C

314 acres treated

Force Account

120 acres picloram + 2,4-D	$3,300
60 acres clopyralid	$2,400
12 acres Dicamba	$ 30
12 acres Glyphosate	$ 300
36 acres Dicamba/2,4-D	$ 300

labor	$8,000
SUB TOTAL	*$14,330*
contract 100 acres of treatment	
100 acres at $164.00 acre =	$16,400
contract administration	$ 4,000
Biological Control	
34 acres of treatment	
Insects St. Johnswort	$ 2,500
Insects Knapweed	$ 1,800
SUB TOTAL	*$24,300*
Hand Control	
15 acres	
15 acres x 0.1 acres per day x $120 per day =	*$18,000*
TOTAL FIRST YEAR	**$57,030**

Alternative C, Second Year

90 acres treated

Force Account	
120 acres picloram + 2,4-D	$ 1,650
60 acres clopyralid	$ 600
12 acres Dicamba	$ 10
12 acres Glyphosate	$ 75
36 acres Dicamba/2,4-D	$ 75
labor	$ 5,000
SUB TOTAL	*$ 7,410*
Biological Control	
34 acres of treatment	
Insects St. Johnswort	$ 2,500
Insects Knapweed	$ 1,800
SUB TOTAL	*$ 4,300*
Hand Control	
5 acres	
5 acres x 0.1 acres per day x $120 per day =	*$ 6,000*
TOTAL SECOND YEAR	**$17,710**

Alternative C, Third Year

90 acres treated

Force Account	
120 acres picloram + 2,4-D	$ 825
60 acres clopyralid	$ 300
labor	$ 2,500
SUB TOTAL	*$ 3,625*
Biological Control	
34 acres of treatment	
Insects St. Johnswort	$ 1,250
Insects Knapweed	$ 900
SUB TOTAL	*$ 2,150*
Hand Control	
5 acres	
5 acres x 0.1 acres per day x $120 per day =	*$ 6,000*
TOTAL THIRD YEAR	**$11,775**