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APR 2 9 2005

Larry J. Dawson
Forest Supervisor
Clearwater National Forest
12730 Highway 12
Orofino, Idaho 83544

Subject: North Fork Noxious Weed Treatment Project, North Fork Clearwater River Basin, Idaho, Clearwater, and Shoshone Counties, Idaho--Biological Opinion
File #104.1000 OALS #1-4-05-F-360

Dear Mr. Dawson: Larry

This letter transmits the Fish and Wildlife Service's (Service) Biological Opinion (Opinion) on the effects to listed species from the proposed treatment of noxious weeds in the Orofino and North Fork Clearwater River drainages, Clearwater National Forest (Forest), Idaho. In a letter dated February 16, 2005 and received by the Service on February 18, 2005, the Forest requested formal consultation on the determination under section 7 of the Endangered Species Act (Act) of 1973, as amended, that the proposed action is likely to adversely affect bull trout (*Salvelinus confluentus*). We have concluded that the proposed weed treatment will not jeopardize the continued existence of bull trout.

The Forest determined that the Project will have no effect on the Canada lynx (*Lynx canadensis*) and the bald eagle (*Haliaeetus leucocephalus*), and is not likely to jeopardize the continued existence of the gray wolf (*Canis lupus*). The Service acknowledges these determinations.

The enclosed Opinion is based primarily on our review of the proposed action as described in your February 26, 2005 Biological Assessment (Assessment) regarding the effects of the proposed action on the bull trout and was prepared in accordance with section 7 of the Act. A complete administrative record of this consultation is on file at this office.

Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Clay Fletcher at (208) 378-5256 if you have questions concerning this Opinion.

Sincerely,

for Jeffery L. Foss, Field Supervisor
Snake River Fish and Wildlife Office

Enclosure

cc: FWS, Portland (Salata)
IDFG, Region II, Lewiston (Hennekey)
NOAA Fisheries, Grangeville (Brege)
NPT, Lapwai (Jones)

BIOLOGICAL OPINION
FOR THE
NORTH FORK CLEARWATER RIVER BASIN
NOXIOUS WEED TREATMENT PROJECT
CLEARWATER NATIONAL FOREST
1-4-05-F-360

APRIL 2005
FISH AND WILDLIFE SERVICE
SNAKE RIVER FISH AND WILDLIFE OFFICE
BOISE, IDAHO

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INTRODUCTION

The Fish and Wildlife Service (Service) has prepared the following Biological Opinion (Opinion) in response to the Clearwater National Forest's (Forest) request for formal consultation on the effects to bull trout (*Salvelinus confluentus*) from the North Fork Noxious Weed Treatment Project (Project). The Forest determined that the proposed action is likely to adversely affect bull trout. Based on the analysis presented in the Biological Assessment (Assessment) for this action, the Service concludes that the survival and recovery of bull trout populations will not be jeopardized by the proposed action.

CONSULTATION HISTORY

The Forest and the Service have had the following meetings and correspondence concerning the proposed Project.

February 4, 2004	The Service received electronic mail notification that the Forest was preparing an Environmental Impact Statement on the Project.
March 17, 2004	The Service and other Consultation Streamlining Level 1 Team members and Project biologist discussed the Project at the March Level 1 meeting.
June 28, 2004	The Service participated in a conference call to discuss herbicide treatment analysis information received on June 18 and 24, 2004.
December 30, 2004	The Service received a draft version of the Assessment from the Forest.
January 12, 2005	The Service received electronic mail notification from the Forest addressing proposed changes to the draft Assessment.
January 27, 2005	The Service participated in a conference call with Level 1 Team members to discuss the draft Assessment.
February 8, 2005	The Service discussed the Project with other Level 1 Team members at the February Level 1 meeting. The Level 1 Team reached agreement on determinations for listed fish.
February 18, 2005	The Service received the final Assessment and request for formal consultation.
February 22, 2005	The Service requested by electronic mail additional supporting rationale on the no effect determinations for listed wildlife after noting inaccurate occurrence information in final Assessment.
February 28, 2005	The Service received a revised version of the Assessment with additional information added to the wildlife and proposed action sections.

BIOLOGICAL OPINION

I. DESCRIPTION OF PROPOSED ACTION

A. Action Area

The action area, located within the North Fork Ranger District, Clearwater National Forest, includes the Upper and Lower North Fork Clearwater subbasins that flow into Dworshak reservoir, and the Orofino Creek watershed that flows into the Clearwater River at Orofino, Idaho (Table 1).

Table 1. Watersheds and HUC numbers in the Project action area.

Subbasin	Watershed Number	Watershed Name
Clearwater 17060306	170603060502	Lower Orofino
	170603060501	Upper Orofino
Lower North Fork Clearwater 17060308	170603080601	Alder Creek
	17060308030101	Bear Creek
	170603080101	Beaver Creek
	170603080103	Isabella Creek
	170603080102	NF Clearwater to Beaver
	17060308030102	Minnesaka Creek
Upper North Fork Clearwater 17060307	1706030703	Cayuse Creek
	170603070502	Fourth of July Creek
	170603070105	Lake Creek
	170603070103	Long Creek
	170603070203	Lower Kelly Creek
	1706030704	Moose Creek
	1706030707	Orogrande Creek
	170603070902	Quartz Creek
	170603071001	Skull Creek
	170603070201	Upper Kelly Creek
	170603070101	NF Clearwater to Headwaters
	170603070501	NF Clearwater to Kelly
	170603070104	NF Clearwater to Long
	170603070801	NF Clearwater to Washington
	170603070802	Washington Creek
	1706030706	Weitas Creek

B. Proposed Action

The Forest proposes to treat 500 – 3000 acres of noxious weed infestations annually during the next 10 years; 794 acres have been identified for treatment in 2005. The Forest will use an Integrated Pest Management Approach. Annually, mechanical treatments (e.g., hand-pulling) will be used on approximately 100 acres, biological control on 50 acres, and chemical control on between 500 and 3000 acres. Cultural control (e.g., fertilizing and seeding) methods will be used in conjunction with the other methods. Twenty-eight weed species will be targeted for treatments, including: yellow starthistle (*Centaurea solstitialis*), spotted knapweed (*Centuarea maculosa*), Russian knapweed (*Acroptilon repens*), rush skeletonweed (*Chondrilla juncea*) and orange hawkweed (*Hieracium aurantiacum*). For herbicide treatments, only ground based application methods will be used (i.e., back-pack sprayers, hand pump sprayers, and vehicle/ATV mounted sprayers). No aerial spraying is proposed. The Forest proposes to use clopyralid, dicamba, glyphosate, methsulfuron methyl, picloram, triclopyr, and 2,4-D amine. Where appropriate, herbicides will be combined with each other and with adjuvants (i.e., surfactants, anti-foaming agents, spray dyes, and drift retardants) to increase efficacy.

Best Management Practices (attached as Appendix A) will be used to minimize effects to aquatic resources. For example, within riparian habitat conservation areas (RHCAs) methods of application, herbicide selection, and maximum windspeed will be more restrictive the closer the treatment is to water.

Weed treatment proposals for the upcoming year will be submitted by February 15 of each year for review by the Forest Fish Biologist or Hydrologist. The Forest will conduct post-treatment evaluations of weed treatments completed during the year. The evaluations will be summarized in annual reports to be completed by December 31 of each year. The summary reports will contain monitoring results, treated area by watershed, environmental effects, and compliance evaluations.

II. STATUS OF THE SPECIES

A. Species Description

Bull trout *(Salvelinus confluentus)*, member of the family Salmonidae, are char native to the Pacific Northwest and western Canada. The bull trout and the closely related Dolly Varden (*Salvelinus malma*) were not officially recognized as separate species until 1980 (Robins et al. 1980). Bull trout historically occurred in major river drainages in the Pacific Northwest from the southern limits in the McCloud River in northern California and the Jarbidge River in Nevada to the headwaters of the Yukon River in the Northwest Territories, Canada (Cavender 1978; Bond 1992). To the west, bull trout range includes Puget Sound, coastal rivers of British Columbia, Canada, and southeast Alaska (Bond 1992). Bull trout are wide-spread throughout the Columbia River basin, including its headwaters in Montana and Canada and also occur in the Klamath River basin of south central Oregon. East of the Continental Divide, bull trout are found in the headwaters of the Saskatchewan River in Alberta and the MacKenzie River system in Alberta and British Columbia (Cavender 1978; Brewin and Brewin 1997).

On June 10, 1998, the Service issued a final rule listing the Columbia River and Klamath River populations of bull trout as threatened (63 FR 31647) under the authority of the Act. With the listing as threatened of the Jarbidge River population (64 FR 17110, November 1, 1999) and the Coastal-Puget Sound and St. Mary-Belly River populations (64 FR 58910, November 1, 1999), all bull trout in the coterminous United States received full protection under the Act. These five populations listed in the final rule were identified as Distinct Population Segments (DPS).

B. Life History

Bull trout exhibit resident and migratory life-history strategies through much of the current range (Rieman and McIntyre 1993). Resident bull trout complete their entire life cycle in the streams where they spawn and rear. Migratory bull trout spawn and rear in streams for one to four years before migrating to either a lake (adfluvial), river (fluvial), or in certain coastal areas, to saltwater (anadromous), where they reach maturity (Fraley and Shepard 1989; Goetz 1989). Resident and migratory forms often occur together and it is suspected that individual bull trout may give rise to offspring exhibiting both resident and migratory behavior (Rieman and McIntyre 1993).

Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Watson and Hillman (1997) concluded that watersheds must have specific physical characteristics to provide habitat requirements for bull trout to successfully spawn and rear, and that the characteristics are not necessarily ubiquitous throughout these watersheds resulting in patchy distributions even in pristine habitats.

Bull trout are found primarily in colder streams, although individual fish are migratory in larger, warmer river systems throughout the Columbia River basin (Fraley and Shepard 1989; Rieman and McIntyre 1993, 1995; Buchanan and Gregory 1997; Rieman et al. 1997). Water temperature above 15°C (59°F) is believed to limit bull trout distribution, which may partially explain the patchy distribution within a watershed (Fraley and Shepard 1989; Rieman and McIntyre 1995). Spawning areas are often associated with cold-water springs, groundwater infiltration, and the coldest streams in a given watershed (Pratt 1992; Rieman and McIntyre 1993; Rieman et al. 1997). Goetz (1989) suggested optimum water temperatures for rearing of about 7 to 8°C (44 to 46°F) and optimum water temperatures for egg incubation of 2 to 4°C (35 to 39°F).

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Oliver 1979; Fraley and Shepard 1989; Goetz 1989; Hoelscher and Bjornn 1989; Sedell and Everest 1991; Pratt 1992; Thomas 1992; Rich 1996; Sexauer and James 1997; Watson and Hillman 1997). Jakober (1995) observed bull trout overwintering in deep beaver ponds or pools containing large woody debris in the Bitterroot River drainage, Montana, and suggested that suitable winter habitat may be more restrictive than summer habitat. Bull trout prefer relatively stable channel and water flow conditions (Rieman and McIntyre 1993). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997).

The size and age of bull trout at maturity depends upon life-history strategy. Growth of resident fish is generally slower than migratory fish; resident fish tend to be smaller at maturity and less fecund (Fraley and Shepard 1989; Goetz 1989). Bull trout normally reach sexual maturity in 4 to 7 years and live as long as 12 years. Repeat and alternate year spawning has been reported, although repeat spawning frequency and post-spawning mortality are not well known (Leathe and Graham 1982; Fraley and Shepard 1989; Pratt 1992; Rieman and McIntyre 1996).

Bull trout typically spawn from August to November during periods of decreasing water temperatures. Migratory bull trout frequently begin spawning migrations as early as April, and have been known to move upstream as far as 250 kilometers (km) (155 miles (mi)) to spawning grounds (Fraley and Shepard 1989). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992), and after hatching, juveniles remain in the substrate. Time from egg deposition to emergence may exceed 200 days. Fry normally emerge from early April through May depending upon water temperatures and increasing stream flows (Pratt 1992; Ratliff and Howell 1992).

Bull trout are opportunistic feeders with food habits primarily a function of size and life-history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macro-zooplankton and small fish (Boag 1987; Goetz 1989; Donald and Alger 1993). Adult migratory bull trout are primarily piscivores, known to feed on various fish species (Fraley and Shepard 1989; Donald and Alger 1993).

C. Population Dynamics

Although bull trout are widely distributed over a large geographic area, they exhibit a patchy distribution even in pristine habitats (Rieman and McIntyre 1993). Increased habitat fragmentation reduces the amount of available habitat and increases isolation from other populations of the same species (Saunders et al. 1991). Burkey (1998) concluded that when species are isolated by fragmented habitats, low rates of population growth are typical in local populations and their probability of extinction is directly related to the degree of isolation and fragmentation. Without sufficient immigration, growth of local populations may be low and probability of extinction high. Migrations also facilitate gene flow among local populations because individuals from different subpopulations interbreed when some stray and return to non-natal streams. Local populations that are extirpated by catastrophic events may also become reestablished in this manner.

The draft bull trout Recovery Plan (Service 2002) defined core areas as groups of partially isolated local populations of bull trout with some degree of gene flow occurring between them. Based on this definition, core areas can be considered metapopulations. A metapopulation is an interacting network of local populations with varying frequencies of migration and gene flow among them (Meefe and Carroll 1994). In theory, bull trout metapopulations (core areas) can be composed of two or more local populations, but Rieman and Allendorf (2001) suggest that for a bull trout metapopulation to function effectively, at a minimum between five and 10 local populations are required. Bull trout core areas with fewer than five local populations are at increased risk of local extirpation, core areas with between five and 10 local populations are at intermediate risk, and core areas with more than 10 local interconnected local populations are at diminished risk (Service 2002).

Long term persistence of local bull trout populations is dependent upon the presence of adult spawning fish in sufficient numbers to avoid inbreeding. Similarly within a larger metapopulation unit, such as a core area, adult spawning fish are required in sufficient numbers to maintain genetic variation. For bull trout, Rieman and Allendorf (2001) estimate that a minimum of 100 spawning adults per year is needed to minimize potential inbreeding effects in any population. Approximately 1,000 spawning adults are necessary for maintaining genetic variation.

Based on the works of Rieman and McIntyre (1993) and Rieman and Allendorf (2001), the draft bull trout Recovery Plan identified four elements to consider when assessing long-term viability of bull trout populations: 1) number of local populations, 2) adult abundance (defined as the number of spawning fish present in a core area in a given year); 3) productivity, or the reproductive rate of the population; and 4) connectivity (as represented by the migratory life history form).

D. Status and Distribution

Though wide-ranging in parts of Oregon, Washington, Idaho, and Montana, bull trout in the interior Columbia River basin presently occur in only about 45 percent of the historical range (Quigley and Arbelbide 1997; Rieman et al. 1997). Declining trends and associated habitat loss and fragmentation have been documented rangewide (Bond 1992; Schill 1992; Thomas 1992; Ziller 1992; Rieman and McIntyre 1993; Newton and Pribyl 1994; Idaho Department of Fish and Game in litt. 1995). Several local extirpations have been reported, beginning in the 1950s (Rode 1990; Ratliff and Howell 1992; Donald and Alger 1993; Goetz 1994; Newton and Pribyl 1994; Berg and Priest 1995; Light et al. 1996; Buchanan and Gregory 1997; Washington Department of Fish and Wildlife 1997).

The combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest and poaching, entrainment into diversion channels and dams, and introduced nonnative species (e.g., brook trout (*Salvelinus fontinalis*)) have resulted in declines in bull trout distribution and abundance. Land and water management activities such as dams and other diversion structures, forest management practices, livestock grazing, agriculture, road construction and maintenance, mining, and urban and rural development continue to degrade bull trout habitat and depress bull trout populations (Service 2002).

1. Columbia River Distinct Population Segment (DPS)

The Columbia River DPS includes bull trout residing in portions of Oregon, Washington, Idaho, and Montana. Bull trout are estimated to have occupied about 60 percent of the Columbia River Basin, and presently occur in 45 percent of the estimated historical range (Quigley and Arbelbide 1997). The Columbia River DPS has declined in overall range and numbers of fish (63 FR 31647). The population segment is comprised of 22 recovery units (Service 2002) with 141 subpopulations indicating habitat fragmentation, isolation, and barriers that limit bull trout distribution and migration within the basin. Although some strongholds still exist with migratory fish present, bull trout generally occur as isolated local populations in headwater lakes or tributaries where the migratory life history form has been lost. Though still widespread, there have been numerous local extirpations reported throughout the Columbia River basin. In Idaho, for example, bull trout have been extirpated from 119 reaches in 28 streams (Idaho Department of Fish and Game in litt. 1995).

2. Clearwater River Recovery Unit

The draft bull trout Recovery Plan (Service 2002) identified the Clearwater River as a recovery unit (a collection of bull trout populations that share genetic characteristics and management jurisdiction). Recovery units contain core areas comprised of local populations and potential local populations.

Bull trout are distributed throughout most of the large rivers and associated tributary systems within the Clearwater River recovery unit (Clearwater Subbasin Summary 2001) and exhibit adfluvial, fluvial, and resident life history patterns. There are two naturally occurring adfluvial bull trout populations within the Clearwater River recovery unit; one is associated with Fish Lake in the upper North Fork Clearwater River drainage, and the other is associated with Fish Lake in the Lochsa River drainage (CBBTTAT 1998a, CBBTTAT 1998b). The Bull Trout Recovery Team has identified seven core areas and 35 local bull trout populations within the Clearwater recovery unit (Service 2002). The core areas include the North Fork Clearwater River, Fish Lake (NF Clearwater River), Lochsa River, Fish Lake (Lochsa River), Selway River, Lower and Middle Fork Clearwater Rivers, and South Fork Clearwater River.

3. North Fork Clearwater River Core Area

Historically, adult bull trout routinely used the North Fork Clearwater in the winter and early spring prior to ascending the river to spawning tributaries in the summer and fall. Dworshak Dam, constructed in 1971, isolated North Fork bull trout populations from other populations in the Clearwater recovery unit. Adult bull trout are now known to overwinter in Dworshak Reservoir and migrate upstream to spawning areas during the summer (Idaho Department of Fish and Game 2003); a once-fluvial population is now adfluvial. Compared to historic numbers, bull trout populations in the North Fork core area are now considered depressed (Forest Service 2005). Bull trout are currently known to use spawning and rearing habitat in at least 11 streams or stream complexes (i.e., local populations) in the North Fork Clearwater core area. Risks to long-term viability of this core area are considered reduced because of the presence of more than 10 local populations, presence of the migratory life history form, and presence of connectivity between local populations within the core area. However, factors increasing the risk to viability include a potentially low number of adult spawning bull trout, and the presence of a migration barrier created by Dworshak dam.

4. Lower and Middle Fork Clearwater River Core Area

Bull trout use the lower mainstem Clearwater River, Middle Fork Clearwater River and tributaries primarily as foraging, migratory, rearing, and overwintering habitat. Lolo and Clear Creeks potentially provide spawning and rearing habitat (Service 2002). Viability of this core area is at increased risk as there is only one local population present, and there is low productivity and loss of the migratory life history form.

III. ENVIRONMENTAL BASELINE

The environmental baseline is defined as: 1) the current habitat condition including the past and present impacts on bull trout of all Federal, state or private actions and other human activities in the action area; 2) the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation; 3) and the impacts of state or private actions that are contemporaneous with the consultation in process.

A. Status of the Species in the Action Area

Bull trout presently occur throughout the North Fork Clearwater subbasin with both resident and adfluvial fish present. There are 11 local bull trout populations (areas with documented spawning and early rearing) in the North Fork Clearwater core area: Upper North Fork Clearwater River, Kelly Creek, Cayuse Creek, Moose Creek, Fourth of July Creek, Weitas Creek, Quartz Creek, Skull Creek, Isabella Creek, Little North Fork Clearwater River, and Floodwood Creek. Because of the concentrated, extended presence of adults, eggs, and fry in spawning areas, the risk of bull trout exposure to herbicides is considered greatest in bull trout spawning areas (i.e., local populations); therefore, this discussion (and the remainder of the Opinion) will focus on local populations in the action area. In terms of fish density and number of redds observed, Upper North Fork Clearwater River and Little North Fork Clearwater River are the strongest local populations in the action area (Table 2). Redd survey data is lacking for Cayuse and Fourth of July local populations.

By multiplying the number of redds counted during surveys by a factor of two, the number of adult spawning bull trout present in a population can be estimated (Dunham and Reiman 2001, Whitesel et al. 2004). Using redd survey data compiled by Idaho Department of Fish and Game (2004), it appears that the North Fork Clearwater local population is the only population with greater than 50 (but probably less than 500) spawning adults present per year (Table 2). The Little North Fork Clearwater may have approximately 50, while numbers in the remaining local populations range from a low of two in Isabella, Weitas, and Quartz, to 28 in the Kelly Creek local population. Redd survey results were not available for Cayuse and Fourth of July Creeks. Although these are only gross approximations of spawning adult abundance in the local populations, they do provide an indication of the relative risk to local populations from inbreeding depression. Reiman and Allendorf (2001) estimate that between 50 and 100 spawning adults are needed to minimize potential inbreeding effects in local populations. Based on these estimates, Upper North Fork is at reduced risk, Little North Fork is at intermediate risk and the remainder of populations for which data is available is at high risk.

In the Orofino Creek drainage, no bull trout have been documented in the upper watershed above Orofino Falls. Bull trout rearing conditions in lower Orofino Creek are rated as poor due to high water temperatures and overall poor habitat conditions; low numbers of bull trout may use the lower watershed.

B. Factors Affecting the Species in the Action Area

As previously described in the Status of the Species section of this Opinion, bull trout distributions, abundance, and habitat quality have declined rangewide primarily from the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest, poaching, entrainment, and introduced nonnative fish species. Land and water management activities that depress bull trout populations and degrade habitat include dams and other water diversion structures, forest management practices, livestock

Table 2. Local bull trout populations in the North Fork Clearwater River and tributaries with stream names and results of available population and redd surveys, and estimate of number of adult spawners. Blank cells indicate a lack of available data.

Local Population	Spawning Stream	Density (Fish/100 sq.m.) (CBBTTAT)[1]	Average Number of Redds (IDFG)[2]	Effective Population Size Estimate
Upper North Fork	North F. Clearwater	0.3-1.7	1	2
	Graves			
	Chamberlain			
	Bostonian	0.5—4.0	5	10
	Niagara	0.6-0.9	6	12
	Boundary	4.8-6.4	2	4
	Long	1.1-4.1	2.5	5
	Slate			
	Short	1.1		
	Rawhide	1.8		
	Lake		15	30
	Goose		1	2
	Vanderbilt Gulch	0.1-0.5	18	36
Kelly Creek	North F. Kelly	1.3	14	28
	South F. Kelly	0.2		
	Kid Lake Creek			
	Bear Creek			
Cayuse Creek	Cayuse			
	Silver			
	Howard			
	Weasel			
	Mink			
Moose	Upper Moose	0.2	0	
	Little Moose		0	
	Ruby		0	
	Swamp		2	4
	Osier		1	2
Fourth of July Creek				
Weitas Creek			1	2
Quartz Creek		0.2	1	2
Skull Creek		0.1	3	6
Isabella Creek		0.2	1	2
Little North Fork Clearwater			22	44
Floodwood Creek			2˙	4

[1] CBBTTAT 1998
[2] Idaho Department of Fish and Game 2004

grazing, agriculture, road construction and maintenance, mining, and urban and rural development. All of these activities with the exception of agriculture and urban development have occurred and are occurring in the action area with resulting adverse impacts on bull trout and bull trout habitat. Current data indicate that bull trout populations are depressed in the North Fork and tributaries compared with reported historical population numbers.

Construction of Army Corps of Engineer's Dworshak dam on the North Fork Clearwater River near its confluence with the Lower Clearwater River was completed in 1971. As there is no passage for migrating fish, Dworshak dam has eliminated connectivity of bull trout in the North Fork Clearwater River core area with other bull trout populations in the Clearwater recovery unit. The dam has also eliminated the runs of anadromous salmonids that provided an annual cycle of nutrient flow and forage for bull trout. Kokanee salmon (*Onchorhynchus nerka*), introduced into the reservoir, migrate upstream into the riverine system for spawning, and may partially compensate for these losses. However, kokanee in Dworshak reservoir have shown a low annual survival rate and the population has not been stable from year to year. Large numbers of kokanee are lost through entrainment in the reservoir spillway during seasonal water releases and reservoir drawdown (Idaho Department of Water Resources 2000); bull trout may be similarly affected, although as of 2001 entrainment of bull trout had not been documented (Idaho Department of Fish and Game 2003). Summer water drawdowns in the reservoir may interfere with both bull trout and kokanee spawning migrations by creating physical and thermal barriers to tributary streams (Idaho Department of Water Resources 2000).

Another factor directly affecting bull trout within the action area is capturing and handling bull trout for research and restoration projects (using weirs, screw traps, and electrofishing) as well as surveying for bull trout by snorkeling. These activities are regulated by Idaho Department of Fish and Game under an agreement with the Service under section 6 of the Act, and are not expected to result in significant impacts to bull trout population numbers and distribution in the action area.

Road building and land management activities have been extensive in some watersheds containing local populations. Because of the numerous ecological effects of road construction and associated activities such as timber harvest (Jones et al. 2000, Trombulak and Frissell 2000) road density can be used as an indicator of watershed condition where less than one mile of road per square mile of watershed indicates high condition, one to three miles indicates moderate condition, and greater than three miles indicates low condition (National Marine Fisheries Service 1996). There appears to be an inverse relationship between watershed road density and bull trout occurrence in that bull trout typically do not occur where road densities exceed 1.7 miles per square mile (Service 2002). Bull trout population strongholds occur most often in roadless areas (Quigley and Arbelide 1997, Kessler et al. 2001). Of the affected watersheds containing local bull trout populations, all except Lower Quartz are rated as being in high and moderate condition based on road density (Table 3).

Table 3. Road density in bull trout local populations in the North Fork Clearwater basin and associated habitat condition.

Local Population/Affected Streams		Road Density (mi./sq. mi.)	Habitat Condition based on Road Density
Isabella Creek		1.2 (Lower), 0 (Upper)	Moderate and High
Cayuse Creek		0.3	High
Fourth of July Creek		0	High
Upper North Fork Clearwater	Lake Creek	1.6	Moderate
	Long Creek	0.9	High
	Upr NF Clw - Hdwtrs	0.7	High
	Upr NF Clw - Long		
Moose		2.2	Moderate
Quartz		3.1 (Lower), 0.5 (Upper)	Low and High
Skull Creek		2.4	Moderate
Kelly Creek	Upper Kelly Creek	0.1	High
	Lower Kelly Creek	0.6	High
Weitas Creek	Upper Weitas Creek	0	High
	Lower Weitas Creek	0.8	High

Quartz, Isabella, and Moose Creek drainages have been degraded by historic timber harvest (Service 2002). Riparian vegetation has been removed by logging in the Kelly Creek drainage (particularly Moose and Cayuse Creek watersheds), and by fire in Isabella, Skull, and Quartz Creeks.

The Assessment discusses general bull trout habitat conditions in the action area in terms of stream temperature, substrate condition, roads, road crossings, and water quality. Of these factors, high summer water temperatures, fine sediment, and road density (including road crossings) are thought to limit bull trout distribution and production in the action area. With the exception of water temperature and fine sediment, water quality in the North Fork Clearwater River basin is considered to be excellent (and not limiting to bull trout) with no incidences of biological or chemical pollution documented.

In summary, while some local populations such as Quartz, Moose, and Isabella are exposed to degraded habitat conditions, habitat conditions for the majority of populations in the action area are moderate to good. Connectivity exists between local populations but numbers of annual spawning adults appears to be low and the risk of inbreeding depression is high for the majority of local populations.

IV. EFFECTS OF THE ACTION

A. Direct and Indirect Effects

Direct effects are defined as those that result from the proposed action and directly or immediately impact the species or its habitat. Indirect effects are those that are caused by or will result from the proposed action and are later in time but are still reasonably certain to occur (50 CFR §402).

Insignificant effects to bull trout are expected from mechanical, cultural, and biological treatments of weeds. Insignificant effects to bull trout are also expected from ground based herbicide treatments outside of riparian habitat conservation areas (RHCAs) given the distance

Table 4. Local bull trout populations in the North Fork Clearwater River where there are proposed RHCA herbicide treatments, RHCA acres proposed for treatment in 2005, distance of treatment from water, and the herbicides proposed for use. Treatments in subsequent years are expected to be similar both in location and herbicide use, although some treatments may occur in Weitas or Fourth of July Creeks. Blank fields indicate no proposed use of the compound in specified stream.

Local Population/Affected Streams		**Distance From Water in Feet and Acres Treated with Specified Herbicide**		
		0-15 feet	**15-100 feet**	**100+ feet**
		Glyphosate - Rodeo	**Clopyralid unless indicated otherwise)**	**(Clopyralid unless indicated otherwise)**
Isabella Creek			10	7
Cayuse Creek			20 1 (Dicamba) 2 (2,4-D)	7 1 (Picloram) 2 (2,4-D)
Fourth of July Creek				
Upper North Fork Clearwater	Lake Creek		22 1(Dicamba)	3 1(Picloram)
	Long Creek		15	3
	Upr NF Clw - Hdwtrs		5	2
	Upr NF Clw - Long	3	30 1(Dicamba)	10
Moose			60	25
Quartz			14	5
Skull Creek			10	4
Kelly Creek	Upper Kelly Creek		30	2
Weitas Creek				

from bull trout streams and implementation of the best management practices (BMPs, Appendix A). The Service assumes that treatments within RHCAs have greater potential for delivering herbicides to aquatic systems than treatments in upland sites and therefore pose a greater risk to bull trout. Risks to bull trout from herbicide treatments are directly correlated with probability of herbicide exposure and the likelihood of bull trout presence. Therefore, the effects analysis will focus on those streams with treatments within RHCAs of streams with documented bull trout spawning (those streams with the highest probability of bull trout presence and the potential presence of eggs, alevins and fry) as shown in Table 4. Fourth of July and Weitas Creeks have no herbicide treatments proposed for 2005, but may be treated in subsequent years and are therefore included in the analysis. Although no bull trout redds have been documented in Cayuse Creek, spawning is suspected because of the presence of early rearing bull trout. Therefore, Cayuse Creek is included in this analysis.

Herbicides may affect bull trout directly through toxic effects to fish themselves or indirectly through impacts on macroinvertebrate prey species or through effects to habitat components such as streamside vegetation (Norris et al. 1991). Adjuvants, compounds added to herbicide formulations to improve herbicide effectiveness or facilitate application or mixing (e.g., surfactants, wetting agents, or dyes), may also be toxic to bull trout. Because of their toxicity, proposed BMPs prohibit the use of the surfactant R-900, and surfactant R-11 will not be mixed with the herbicides Rodeo, Accord, or Aquamaster.

Bull trout may directly contact an herbicide in the water, sediment, or food. Herbicides may enter the water (and sediment or food) through direct application, volatilization, drift, mobilization in ephemeral streams (including roadside ditches), overland flow, and leaching, with each of these routes resulting in a different exposure magnitude and duration. Herbicides may contact terrestrial salmonid food sources (e.g., insects) which may subsequently enter streams and be consumed by bull trout (Norris et al. 1991). Of these delivery routes, direct application and drift may result in the highest aquatic herbicide concentrations and potential exposure to bull trout (Norris et al. 1991).

Because the proposed action specifies that all herbicide applications within 50 feet of live water will be directed away from surface water and there will be no aerial spraying, direct introduction of herbicides into live water is not expected.

Herbicides volatilize when they enter a gaseous phase and are transported on air currents with potential delivery to bull trout habitat. Volatility is dependent upon the molecular weight of the herbicide and will increase with increasing temperature and soil moisture (Tu et al. 2001). The Assessment identifies dicamba as the only volatile herbicide proposed for use. The use of dicamba is not authorized within 15 feet of surface water thus minimizing but not eliminating the risk of dicamba from reaching bull trout habitat.

The risk of introducing herbicides to live waters by drift will be minimized because no aerial spraying will occur under the proposed action. Only ground-based single nozzle application methods will be used, and application will only occur when wind speeds are below a specified level. However, the drift distance is also dependent upon spray droplet size and height of application with drift being minimized by using the coarsest droplet size and lowest application height (Spray Drift Task Force 1997).

Herbicide delivery to live waters by overland flow and leaching is primarily dependent upon total rainfall occurring within a few days of initial application (Tu et al. 2001). Under the proposed action, herbicide application is not permitted when heavy precipitation is occurring or is imminent. However if unanticipated heavy precipitation does occur within a few days of treatment some herbicide may be introduced into bull trout habitat (Wood 2001).

The amount of herbicide introduced to a stream by runoff or leaching after a precipitation event is dependent upon a number of factors including adsorption characteristics and water solubility of the herbicide as well as the timing of the precipitation event and the soil half-life (an indicator of persistence in soil) of the herbicide. In the Assessment, herbicides were rated on their potential to move towards ground water (this rating would also apply to overland runoff movement) based on soil half-life, sorption coefficient, and water solubility. Of the herbicides proposed for use in RHCAs in the action area, clopyralid, picloram, and dicamba have a very high movement rating; 2,4-D has a moderate rating; and glyphosate which has a high sorption coefficient has a very low movement rating. Under the same application conditions herbicides with a high movement rating are more likely to reach bull trout streams.

An additional proposed protection measure to reduce risk to bull trout is allowing only aquatically approved herbicides within 15 feet of water (i.e., Rodeo formulation of glyphosate with no surfactants). All of the herbicides proposed for use except picloram are classified as being of low aquatic concern (Table 5). The level of aquatic concern for picloram is moderate; use of picloram, a persistent herbicide with reported half-life values of more than three years (Tu et al. 2001) and a high movement rating, will not be authorized for use within 100 feet of surface streams and is only proposed for use on two acres in 2005. Also, picloram will only be used on any given site once every two years. However, there is concern that if picloram is applied to dry streams or roadside ditches, the first post-application rainfall may mobilize the herbicide and deliver it to bull trout habitat.

Direct exposure of bull trout to herbicides may result in lethal and sublethal effects depending upon the toxicity and concentration of the particular herbicide as well as the duration of exposure. Best management practices (Appendix A) are expected to substantially reduce the amount of any herbicide or herbicide/adjuvant mixture from reaching surface waters and potentially affecting bull trout. Also, herbicides, should they be delivered to bull trout streams, are expected to be rapidly diluted downstream of the entry point (Norris et al. 1991). As shown in Table 5, the predicted aquatic herbicide concentrations are far below the No Observed Effect Level (NOEL). Only 794 acres are proposed for herbicide treatments in 2005, but up to 3,000 total acres may be treated annually during the 10 year duration of the Project depending upon available funding. Appendix D of the Assessment shows the calculated maximum number of acres that could be treated with herbicides without lethal effects to bull trout; for example a maximum of 110,686 acres in the Weitas Creek watershed could be treated with clopyralid without lethal effects. Based on these calculations, lethal effects to bull trout are not expected from herbicide treatments on even the proposed annual maximum of 3,000 acres.

Table 5. Herbicides proposed for use within RHCAs showing active ingredient, product name, level of aquatic concern, application rate, toxicity, generalized environmental concentration, and no observed effect level for fish (NOEL).

Active Ingredient	Product Name	Aquatic Concern	Application Rates lb ai/acre Typical	Toxicity 96-hr LC50 (mg/L)	Generalized Environmental Concentration (mg/L (ppm))	NOEL (no-observed effect level) (ppm) Fish
Clopyralid	Transline	Low	0.38	104	0.89	20
2,4-D amine	Amine 4 Weedar 64	Low	1	250	0.002	10
Glyphosate	Accord Rodeo	Low	1	>1000	0.001	1
Dicamba	Banvel	Low	0.75	>100	0.0001-0.0004	50
	Vanquish	Low	0.75	135	0.92	6.75
Picloram	Tordon 22K	Moderate	0.5	13-100	0.0012	0.55

Although no mortality of bull trout is expected from proposed herbicide treatments, sublethal effects may occur. In general, there is a paucity of information available on the sublethal effects of the herbicides proposed for use with this action, although sublethal behavioral effects on fish have been documented for a wide variety of other environmental pollutants including various metals and organic pollutants (see Scott and Sloman 2004 for a review). Herbicide risk assessments completed for the Forest Service were consulted for the information summarized in the Assessment (SERA 1995-2001). A review of the recent literature provided very little additional information. Some limited information is available on the sub-lethal effects of picloram; 2,4-D; clopyralid; and dicamba. Changes in growth, behavior, reproduction, resistance to stress, migration, biochemistry, and physiology are potential responses of bull trout to sublethal herbicide exposure (Norris et al. 1991). Based on available information, glyphosate (Rodeo only) appears to pose the lowest risk of sub-lethal effects to bull trout (Forest Service 2004).

Indirect effects of herbicide treatments on bull trout may include habitat effects and effects to macroinvertebrate prey species. Herbicide treatments may decrease streamside vegetation cover and result in increases in stream temperature. In the action area, RHCA treatments involve a very small area within each watershed and any effects to water temperature from the alteration of streamside vegetation are expected to be insignificant. Herbicide treatments of noxious weeds may also have beneficial effects on bull trout by facilitating the reestablishment of native plant communities that provide shade, habitat complexity, streambank stability, and habitat for invertebrate prey species.

Indirect effects to bull trout may occur through direct effects to aquatic microorganisms. Glyphosate at expected environmental concentrations (EEC) was found to significantly affect carbon uptake in two diatom species (DeLorenzo et al. 2001). Effects to microorganisms can result in effects at higher trophic levels (DeLorenzo et al. 2001), including effects to bull trout, if these impacts lead to reduced density or availability of macroinvertebrates or piscine prey.

Although herbicides may directly affect aquatic microorganisms and thereby affect higher trophic levels, effects are not expected through the process of bioaccumulation. Bioaccumulation of a chemical in an aquatic organism is the sum of the quantity of chemical absorbed from the water (bioconcentration) and the quantity taken in through dietary uptake (biomagnification) (Epaminondas et al. 2002). Because the herbicides proposed for use in the action area are relatively water soluble, bioaccumulation is not expected (Norris et al. 1991).

Herbicide applications applied during peak spring flows would pose the lowest risk to bull trout as any herbicide reaching bull trout streams would be quickly diluted. Herbicide application during low late summer/early fall base flows or in spawning areas would pose the highest risk. Similarly, applications adjacent to mainstem rivers pose a lesser risk to bull trout than applications in smaller tributaries. The timing and exact location of herbicide treatments is not specified in the Assessment therefore the Service assumes that applications may occur in headwaters of bull trout streams during low flows and adfluvial and resident adults, rearing juveniles and redds (eggs, alevins, and fry) may all potentially be affected. The risks to spawning adults and redds will be reduced because no herbicide applications will be permitted in streams with documented bull trout spawning after July 31 (includes all streams in Table 4 except Fourth of July and Cayuse Creeks). Although risks to spawning adults and redds (including eggs, alevins, and fry) may be reduced by this time restriction, staging adults and rearing fry and juveniles will remain vulnerable to herbicide exposure.

In summary, depending on the herbicide and location where it is used, the proposed action may adversely affect all bull trout life stages through sub-lethal effects, alterations of the aquatic food web, toxic chemical effects, and loss of riparian vegetation. However, with the exception of picloram, all herbicides proposed for use are of low aquatic concern. Additionally, the amount of potential bull trout exposure is low from this proposed action. Finally, risks to bull trout will be reduced by implementation of the BMPs. Herbicide treatments may beneficially affect bull trout by enhancing populations of native riparian plant species by reducing noxious weed populations.

B. Effects of Interrelated or Interdependent Actions

The Service did not identify any interrelated or interdependent actions associated with the proposed herbicide treatments.

V. CUMULATIVE EFFECTS

Cumulative effects are the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Illegal and inadvertent harvest of bull trout is also considered a cumulative effect. Harvest can occur through both misidentification and deliberate catch. Schmetterling and Long (1999) found that only 44 percent of the anglers they interviewed in Montana could successfully identify bull trout. Being aggressive piscivores, bull trout readily take lures or bait (Ratliff and Howell 1992).

Spawning bull trout are particularly vulnerable to harvest because the fish are easily observed during autumn low flow conditions. Hooking mortality rates range from 4% for nonanadromous salmonids with the use of artificial lures and flies (Schill and Scarpella 1997) to a 60% worst case scenario for bull trout taken with bait (Idaho Department of Fish and Game 2001b). Thus, even in cases where bull trout are released after being caught some mortality can be expected.

VI. CONCLUSION

The Service has reviewed the current status of bull trout, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects. It is the Service's biological opinion that proposed herbicide treatments within the action area, are not likely to jeopardize the continued existence of the North Fork Clearwater core area, the Clearwater recovery unit, or the Columbia River Distinct Population Segment (DPS) of bull trout.

The Service concludes that direct and indirect effects to bull trout would be limited to sublethal harassment or harm to eggs, alevins, fry, juveniles, and adults. These effects are anticipated to occur only within the action area and should be minimized by the BMPs incorporated into the project proposal. Many streams within the action area have not been thoroughly surveyed for bull trout, but the assumption is, based on available data, that bull trout occur in low densities throughout the action area but bull trout will have the greatest risk of exposure to herbicides in those streams and stream systems identified as local populations. However, the probability of adverse sub-lethal effects to individual bull trout from proposed herbicide treatments, while not insignificant or discountable, is low. By reducing noxious weed populations and enhancing populations of native riparian plants, herbicide treatments may beneficially affect bull trout.

The Service expects that the numbers, distribution, and reproduction of bull trout in the action area or in the Columbia Basin DPS will not be significantly changed as a result of this proposed action. Bull trout reproduction within the action area should not be appreciably altered because research indicates that the predicted environmental concentrations of herbicides should be rapidly diluted downstream from the point of any delivery should it occur. As such, the Service has concluded that the survival and recovery of bull trout populations will not be jeopardized by proposed herbicide treatments.

VII. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Forest has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest (1) fails to assume and implement the terms and conditions the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

A. Amount or Extent of Take

The Service expects that any bull trout in the immediate vicinity of herbicide treatments in RHCAs within the action area adjacent to occupied bull trout habitat may be subject to take in the form of harm and harassment due to the potential sub-lethal effects of herbicide exposure. The Service believes that the risk of take will be minimized considerably through application of the BMPs, to be applied during implementation of the proposed action, which may reduce impacts to bull trout and bull trout habitat. As a result, the Service anticipates the total amount of take will be low during the 10-year implementation period. Because the Forest has not identified all precise treatment locations in advance, the Service cannot predict the exact spatial sites where take may occur. Table 4 of this Opinion shows streams where herbicide treatments may be carried out within RHCAs.

Based on survey data, the Service assumes the presence of bull trout in the action area and anticipates that incidental take will only occur and be permitted during the following time period and in the following forms.

1. Take of bull trout in the form of harm or harassment associated with direct and indirect sub-lethal exposure to herbicides during the 10-year period beginning 2005.

2. Take of bull trout in the form of harm or harassment associated with short-term habitat and food supply effects, and short-term changes in water quality.

Incidental take will be limited to the following locations, life forms, and life stages that are likely to be affected.

1. The location of the expected incidental take is in the immediate vicinity of herbicide treatments in RHCAs of streams in the action area with local bull trout populations (Table 4) and extends downstream for a distance of 50 feet from point of probable herbicide delivery (e.g., closest spray location, culvert outlet etc.). Although the Service assumes that the potential for herbicide delivery to bull trout habitat is associated with all RHCA treatments adjacent to local bull trout populations in the action area, it is expected that actual occurrences of delivery will be limited.

2. The life forms expected to be harmed or harassed include fluvial and resident bull trout.

3. The life stages expected to be harmed or harassed from herbicide treatments include adult and juvenile fish, but may also include alevins, embryos and eggs.

The Service expects no lethal take of bull trout (including eggs, alevins, and fry) and none is authorized. If the incidental take authorized by this document is exceeded herbicide treatments will cease and the Forest will reinitiate consultation.

B. Effect of the Take

The Columbia River DPS comprises 22 recovery units including the Clearwater River unit (Service 2002). The Clearwater recovery unit contains seven core areas with 35 local populations.

As previously discussed, given the low application rate, low and moderate level of aquatic concern for selected herbicides, and the BMPs, effects to bull trout from herbicide treatments outside RHCAs are expected to be insignificant. Herbicide applications in RHCAs of bull trout spawning streams (local populations) pose potential risks to bull trout. Nine local populations may be affected by herbicide treatments in RHCAs within the action area. Take is expected to be confined to individual bull trout in the Upper North Fork Clearwater River, Kelly Creek, Cayuse Creek, Moose Creek, Fourth of July Creek, Weitas Creek, Quartz Creek, Skull Creek, and Isabella Creek local populations. The anticipated take may be reduced because of BMPs designed to avoid and reduce adverse effects are included in the proposal, and, at the watershed scale, the total area treated within 100 feet of affected streams is relatively small. The probability that the proposed action will eliminate local populations of bull trout is insignificant. Local bull trout densities and distribution are not expected to be significantly altered. As only nine out of a total of 35 local populations may be affected by herbicide treatments it is unlikely that the proposed action would impair productivity or population numbers of bull trout in the Clearwater recovery unit or in the Columbia River DPS.

C. Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to further minimize take resulting from the proposed herbicide treatments during the 10 year life of the Project.

1. Minimize the potential for harm or harassment of bull trout and disruption of riparian and aquatic habitat from herbicide treatments.

D. Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the Forest must comply with the following terms and conditions which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1a. Prior to applying herbicides in areas with suspected bull trout spawning (but not identified as a spawning area in the BMPs), the Forest will survey and document any spawning areas near treatment sites. These areas include, but are not limited to, Cayuse Creek and Fourth of July Creek (local populations). The BMP prohibiting herbicide applications after July 31 in drainages with documented spawning will be applied to any additional spawning areas the Forest locates.

1b. The Forest will avoid applying picloram to dry ephemeral streams or dry roadside ditches that drain directly into streams occupied by bull trout.

1c. To reduce the risk of spray drift, when spraying herbicides, the Forest, in addition to observing wind speed restrictions, will use the coarsest droplet size that still provides effective plant coverage and the lowest effective nozzle height above target plants.

1d. The Forest will delay all herbicide treatments if precipitation is likely to occur within 24 hours of scheduled application.

E. Reporting Requirements

When incidental take is anticipated, the terms and conditions must include provisions for monitoring to report the progress of the action and impact on the species (50 CFR §402.14(i)(3)).

The Forest will report to the Service on:

(1) Compliance with implementation of the Terms and Conditions.

(2) Remedies to address and resolve problems identified in (1), above.

(3) Any environmental effects of the action that were not considered in the Assessment or this Opinion.

The Forest will notify the Service promptly of any emergency or unanticipated situations in the action area that may be detrimental to bull trout. The Service will then determine if Project activities must cease or may continue, pending resolution of the problem and impacts. The Forest will implement a monitoring strategy that includes monitoring of non-target plant mortality in riparian areas to determine if mortality of non-target plants is affecting riparian functions. The Forest will report to the Service the actual number of acres treated, the chemicals used, application method, location of treatment sites, and monitoring results by March 15 of each year.

Submit all reports, to: Fish and Wildlife Service, Snake River Fish and Wildlife Office, 1387 S. Vinnell Way, Suite 368, Boise, Idaho 83709.

VIII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act requires Federal Agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends that the Forest implement the following conservation measures.

1. Monitor water quality in selected bull trout streams for herbicide presence after the first significant post-application precipitation event to assess the effectiveness of BMPs.

2. Evaluate and implement actions to restore native vegetation in treatment areas giving first priority to bull trout spawning and early rearing streams.

3. Continue to survey and monitor bull trout populations and habitat in the action area to gather baseline and population trend information.

To keep the Service informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification on implementation of any conservation recommendations.

IX. REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

LITERATURE CITED

Berg, R.K. and E.K. Priest. 1995. Appendix Table 1: A list of stream and lake fishery surveys conducted by U.S. Forest Service and Montana Fish, Wildlife and Parks fishery biologists in the Clark Fork River Drainage upstream of the confluence of the Flathead River from the 1950's to the present. Montana Fish, Wildlife, and Parks, Job Progress Report, Project F-78-R-1, Helena, MT.

Boag, T.D. 1987. Food habits of bull char, *Salvelinus confluentus*, and rainbow trout, *Salmo gairdneri*, coexisting in a foothills stream in northern Alberta. Canadian Field-Naturalist 101(1): 56-62.

Bond, C.E. 1992. Notes on the nomenclature and distribution of the bull trout and the effects of human activity on the species. Pages 1-4 *in* Howell, P.J. and D.V. Buchanan, editors. Proceedings of the Gearhart Mountain Bull Trout Workshop. Oregon Chapter of the American Fisheries Society, Corvallis, OR.

Bonneau, J.L. and D.L. Scarnecchia. 1996. Distribution of juvenile bull trout in a thermal gradient of a plunge pool in Granite Creek, Idaho. Transactions of the American Fisheries Society 125: 628-630.

Brewin, P.A. and M.K. Brewin. 1997. Distribution maps for bull trout in Alberta. Pages 206-216 *in* Mackay, W.C., M.K. Brewin and M. Monita, editors. Friends of the Bull Trout Conference Proceedings.

Buchanan, D. M. and S. V. Gregory. 1997. Development of water temperature standards to protect and restore habitat for bull trout and other cold water species in Oregon. Pages 1-8 *in* Mackay, W.C., M.K. Brewin and M. Monita, editors. Friends of the Bull Trout Conference Proceedings.

Bureau of Land Management. 2000a. Lower Salmon River Subbasin Biological Assessment. Cottonwood Field Office, Cottonwood, Idaho.

Bureau of Land Management. 2000b. Little Salmon River Subbasin Biological Assessment. Cottonwood Field Office, Cottonwood, Idaho.

Cavender, T.M. 1978. Taxonomy and distribution of the bull trout, *Salvelinus confluentus* (Suckley), from the American Northwest. California Fish and Game 64(3): 139-174.

Clearwater Basin Bull Trout Technical Advisory Team (CBBTTAT). 1998a. North Fork Clearwater River Basin Bull Trout Problem Assessment. Prepared for the State of Idaho by the CBBTTAT. May 1998.

Clearwater Basin Bull Trout Technical Advisory Team (CBBTTAT). 1998b. Bull Trout Assessment of the Lochsa and Selway Subbasin (including the Middle Fork of the Clearwater upstream of the South Fork). August 1998.

Clearwater Subbasin Summary (CSS). 2001. Draft Clearwater subbasin summary. Prepared for the Northwest Power Planning Council by interagency team, led by D. Statler, Nez Perce Tribe. May 25, 2001.

Cochnauer, T., E. Schriever, and D. Schiff. 2001. Idaho Department of Fish and Game Regional Fisheries Management Investigations: North Fork Clearwater River Bull Trout, Project 9. F-73-R-22.

DeLorenzo, M.E., G.I. Scott, and P.E. Ross. 2001. Toxicity of pesticides to aquatic microorganisms: a review. Environmental Toxicology and Chemistry 20: 84-98.

Donald, D.B. and D.J. Alger. 1993. Geographic distribution, species displacement, and niche overlap for lake trout and bull trout in mountain lakes. Canadian Journal of Zoology 71: 238-247.

Dunham, J., B. Rieman, and K. Davis. 2001. Sources and magnitude of sampling error in redd counts for bull trout. North American Journal of Fisheries Management 21:343-352.

Epaminondas, V., K. Magoulas, and D. Tassios. 2002. Prediction of the bioaccumulation of persistent organic pollutants in aquatic food webs. Chemosphere 48: 645-651.

Fish and Wildlife Service. 2002. Bull Trout (*Salvelinus confluentus*) Draft Recovery Plan. Fish and Wildlife Service, Portland, Oregon.

Forest Service. 2005. Biological Assessment of the North Fork Noxious Weed Treatment Project. Clearwater National Forest, Orofino, Idaho.

Fraley, J.J. and B.B. Shepard. 1989. Life history, ecology and population status of migratory bull trout (*Salvelinus confluentus*) in the Flathead Lake and River system, Montana. Northwest Science 63(4): 133-143.

Gilpin, M., University of California, in litt. 1997. Bull trout connectivity on the Clark Fork River.

Goetz, F. 1989. Biology of the bull trout, *Salvelinus confluentus*, a literature review. Willamette National Forest. Eugene, OR.

Goetz, F.A. 1994. Distribution and juvenile ecology of bull trout (*Salvelinus confluentus*) in the Cascade Mountains. M.S. Thesis, Oregon State University, Corvallis,OR.

Hoelscher, B. and T.C. Bjornn. 1989. Habitat, densities, and potential production of trout and char in Pend Oreille Lake tributaries. Job Completion Report, Project F-71-R-10, Subproject III, Job No. 8. Idaho Department of Fish and Game. Boise, ID.

Idaho Department of Fish and Game, in litt. 1995. List of stream extirpations for bull trout in Idaho.

Idaho Department of Fish and Game. 2003. Bull Trout Life History Investigations in the North Fork Clearwater River Basin. Prepared for the Department of the Army, Corps of Engineers, Contract No. DACW68-96-D-0003. Lewiston, Idaho.

Idaho Department of Fish and Game. 2004. Bull Trout Status Review and Assessment in the State of Idaho. 20 December 2004. http://www.streamnet.org/online-data

Idaho Department of Water Resources. 2000. Dworshak Operation Plan. December 21, 2000. Prepared for Idaho Water Resources Board.

Jakober, M. 1995. Autumn and winter movement and habitat use of resident bull trout and westslope cutthroat trout in Montana. M.S. Thesis, Montana State University, Bozeman, MT.

Leathe, S.A. and P. Graham. 1982. Flathead Lake fish food habits study. E.P. A. through Steering Committee for the Flathead River Basin Environmental Impact Study.

Light, J., L. Herger and M. Robinson. 1996. Upper Klamath Basin bull trout conservation strategy, a conceptual framework for recovery. Part One. The Klamath Basin Bull Trout Working Group.

Meefe, G.K. and C.R. Carroll. 1994. Principles of conservation biology. Sinauer Associates, Inc. Sunderland, MA.

National Marine Fisheries Service. 1996. Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale. National Marine Fisheries Service, Environmental and Technical Services Division, Habitat Conservation Branch.

Newton, J.A. and S. Pribyl. 1994. Bull trout population summary: Lower Deschutes River Subbasin. Oregon Department of Fish and Wildlife, The Dalles, OR.

Norris, L.A., H.W. Lorz, and S.V. Gregory. 1991. Forest Chemicals. Pages 207-296 *in* Meehan, W.R.,Editor. Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitat. American Fisheries Society Special Publication 19.

Oliver, G.G. 1979. Fisheries investigations in tributaries of the Canadian portion of the Libby Reservoir. Fish and Wildlife Branch, Kootenay Region.

Pratt, K.L. 1992. A review of bull trout life history. Pages 5-9 *in* Howell, P. J. and D. V. Buchanan, editors. Proceedings of the Gearhart Mountain Bull Trout Workshop. Oregon Chapter of the American Fisheries Society, Corvallis, OR.

Quigley, T.M. and J.J. Arbelbide. 1997. An assessment of ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great basins. Vol. III. 1174-1185pp.

Ratliff, D. E. and P. J. Howell. 1992. The Status of Bull Trout Populations in Oregon. Pages 10-17 *in* Howell, P.J. and D.V. Buchanan, editors. Proceedings of the Gearhart Mountain Bull Trout Workshop. Oregon Chapter of the American Fisheries Society, Corvallis, OR.

Rich, C.F., Jr. 1996. Influence of abiotic and biotic factors on occurrence of resident bull trout in fragmented habitats, western Montana. M.S. thesis. Montana State University, Bozeman, MT.

Rieman, B.E. and F.W. Allendorf. 2001. Effective population size and genetic conservation criteria for bull trout. North American Journal of Fisheries Management 21:756-764.

Rieman, B.E. and J.D. McIntyre. 1993. Demographic and habitat requirements for conservation of bull trout. General Technical Report INT-302, Intermountain Research Station, U.S. Department of Agriculture, Forest Service, Boise, ID.

Rieman, B.E. and J.D. McIntyre. 1995. Occurrence of bull trout in naturally fragmented habitat patches of varied size. Transactions of the American Fisheries Society 124 (3): 285-296.

Rieman, B.E. and J.D. McIntyre. 1996. Spatial and temporal variability in bull trout redd counts. North American Journal of Fisheries Management 16: 132-141.

Rieman, B.E., D.C. Lee and R.F. Thurow. 1997. Distribution, status and likely future trends of bull trout within the Columbia River and Klamath basins.

Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.H. Lachner, R.N. Lea and W.B. Scott. 1980. A list of common and scientific names of fishes from the United States and Canada. American Fisheries Society Special Publication 12, Bethesda, MD.

Rode, M. 1990. Bull trout, *Salvelinus confluentus* Suckley, in the McCloud River: status and recovery recommendations. Administrative Report Number 90-15. California Department of Fish and Game, Sacramento, CA.

Schill, D.J. 1992. River and stream investigations. Idaho Department of Fish and Game.

Schill, D.J. and R.L. Scarpella. 1997. Barbed hook restrictions in catch-and-release trout fisheries: a social issue. North American Journal of Fisheries Management 17(4): 873-881.

Scott, G.R. and K.A. Sloman. 2004. The effects of environmental pollutants on complex fish behaviour: integrating behavioural and physiological indicators of toxicity. Aquatic Toxicology 68: 369-392.

Sedell, J.R. and F.H. Everest. 1991. Historic changes in pool habitat for Columbia River Basin salmon under study for TES listing. Draft U.S. Department of Agriculture Report. Pacific Northwest Research Station, Corvallis, OR.

SERA (Syracuse Environmental Research Associates, Inc.). 1995. Vanquish risk assessment. Final Draft. SERA TR 95-22-02f. Prepared for USDA Forest Service under Contract No. 43-3187-5-0787. USDA Forest Service, Arlington, Virginia. Available on-line at: http://www.fs.fed.us/foresthealth/pesticide/ risk_assessments/091602_dicamba.pdf

SERA. 1996. Selected commercial formulations of glyphosate - Accord, Rodeo, and Roundup Pro - risk assessment. Final Report SERA TR 96-22-02-01b. Prepared for USDA Forest Service under Contract No. 53-3187-5-12. USDA Forest Service, Arlington, Virginia. Available on-line at: http://www.fs.fed.us/foresthealth/pesticide/risk_assessments/glyphosateriskassessment.pdf

SERA. 1998. 2,4-Dichlorophenoxyacetic acid formulations - human health and ecological risk assessment. Final Report, SERA TR 95-21-09-01d. Prepared for USDA Forest Service under Contract No. 53-3187-5-12. USDA Forest Service, Arlington, VA. Available on-line at: http://www.fs.fed.us/foresthealth/ pesticide/risk_assessments/24D_ra.pdf

SERA. 1999a. Picloram (Tordon K and Tordon 22K). Final Report, SERA TR 99-21-15-01e. Prepared for USDA Forest Service under Contract No. 53-3187-5-12. USDA Forest Service, Arlington, Virginia. Available on-line at: http://www.fs.fed.us/foresthealth/pesticide/ risk_assessments/Picloram_Final.pdf

SERA. 1999b. Clopyralid (Transline). Final Report, SERA TR 99-21-11/12-01d. Prepared for USDA Forest Service under Contract No. 53-3187-5-12. USDA Forest Service, Arlington, Virginia Available on-line at: http://www.fs.fed.us/foresthealth/pesticide/risk_assessments/ clopyralidriskassessment.pdf

SERA. 2000. Metsulfuron-methyl (Escort). Final Report. SERA TR 99-21-21-01f. Prepared for USDA Forest Service, Task No. 21, Contract No. 53-3187-5-12. Available on-line at: http://www.fs.fed.us/foresthealth/ pesticide/risk_assessments/91602_metsul.pdf

SERA. 2001. Imazapic human health and ecological risk assessment. Prepared for USDA Forest Service, Task No. 28, USDA/FS Contract Nos. 53-3187-5-12 and 43-3187-0-0153. Available on-line at: http://www.fs.fed.us/foresthealth/pesticide/risk_assessments/091702_imazapic.pdf

Sexauer, H.M. and P.W. James. 1997. Microhabitat use by juvenile trout in four streams located in the Eastern Cascades, Washington. Pages 361-370 *in* Mackay, W.C., M.K. Brown and M. Monita, editors. Friends of the Bull Trout Conference Proceedings.

Shepard, B., K. Pratt, and P. Graham. 1984. Life Histories of westslope cutthroat and bull trout in the upper Flathead River Basin, Montana. EPA Contract No. R008225-01-5. Montana Department of Fish, Wildlife and Parks, Helena, MT. 115pp.

Spray Drift Task Force. 1997. A Summary of Ground Application Studies. Spray Drift Task Force. At http://agdrift.com/ground/ 8pp.

Swanberg, T.R. 1997. Movements and habitat use by fluvial bull trout in the Blackfoot River, Montana. Transactions of the American Fisheries Society 126: 735-746.

Thomas, G. 1992. Status of bull trout in Montana. Report prepared for Montana Department of Fish, Wildlife and Parks, Helena, MT.

Tu, M., C. Hurd and J.M. Randall. 2001. Weed Control Methods Handbook. The Nature Conservancy. http://tncweeds.ucdavis.edu, version: April 2001.

Washington Department of Fish and Wildlife. 1997. Washington State salmonid stock inventory. Bull trout/Dolly Varden. September 1997. 437pp.

Watson, G. and T. Hillman. 1997. Factors affecting the distribution and abundance of bull trout: an investigation into hierarchical scales. North American Journal of Fisheries Management 17:237-252.

Whitesel, T.A., J. Brostrom, T. Cummings, J. Delavergne, W. Fredenberg, H. Schaller, P. Wilson, and G. Zydlewski. Bull Trout Recovery Planning: a review of the science associated with population structure and size. Science Team Report #2004-01, U.S. Fish and Wildlife Service, Regional Office, Portland, Oregon.

Wood, T. 2001. Herbicide Use in the Management of Roadside Vegetation, Western Oregon, 1999-2000. Water-Resources Investigations Report 01-4065. U.S. Department of the Interior, Geological Survey, Portland, Oregon. 27pp.

Ziller, J.S. 1992. Distribution and relative abundance of bull trout in the Sprague River subbasin, Oregon. Pages 18-29 *in* Howell, P.J. and D.V. Buchanan, editors. Proceedings of the Gearhart Mountain Bull Trout Workshop. Oregon Chapter of the American Fisheries Society, Corvallis, OR.

APPENDIX A. PROJECT DESIGN CRITERIA (BMPs) – Excerpted from Assessment (pages 18-22).

Pre-Project Implementation

1. The Forest will follow established guidelines and best management practices as stated in: (1) USFS Manual 2000 (2080), Noxious Weed Management; (2) USFS Soil and Water Conservation Practices Handbook (FSH 2509.22 – 13), Vegetation Manipulation; and (3) Idaho Forest Practices Act (IDPA 20, Title 02, Chapter 01, 060), Use of Chemicals and petroleum products. The appropriate sections of these three documents are included in Appendix M in the Environmental Assessment (U.S.F.S. Clearwater National Forest 2004).

2. A spill contingency plan developed for this project (Appendix F) will be reviewed by the project coordinator prior to field work. Individuals involved in herbicide handling or application will be instructed on the spill contingency plan and spill control, containment, and cleanup procedures.

3. A pre-project review of all application areas will be made by a designated Fisheries Biologist or Hydrologist and the project coordinator to discuss methods of application, herbicide products, and necessary herbicide restrictions, which may be required. This will include the pre-project evaluation of riparian and surface water buffers.

4. The project coordinator will provide the designated aquatic monitoring personnel a spraying schedule several days in advance in order to set up and conduct the project monitoring.

5. Limited annually application of herbicide chemicals to below the Lethal Concentration (LC50), or No Observed Effect Level/Concentration (NOEL/NOEC) as determined by watershed (Appendix D). However, within any watershed listed in Table 1 (exception mainstem North Fork Clearwater River segments), no more than 1000 acres of federal herbicide application will occur annually.

6. No more than one application of picloram would be made on a given area within a site in any single year to reduce the potential for picloram accumulation in the soil.

7. Do not use picloram where there are coarse, sandy soils. Use of picloram would be allowed only once every two years, to reduce accumulation in the soil. Reduce application rate to a maximum of 1.0 pounds/acre of Picloram with spot treatment of no more that 50% of an acre (USDI-EPA 1995a).

8. No application of 2, 4-D ester formulations or triclopyr-BEE will be allowed.

9. The surfactant R-900 will not be used. R-11 will not be tank mixed with Rodeo, Accord or Aquamaster.

10. No surfactants will be authorized for use within 15 feet of surface water or areas with shallow water tables.

11. No other adjuvants will be used without prior review and approval.

12. Hi-light blue dye will be mixed at a minimum concentration with any herbicide sprays that are applied 15-100 feet from surface waters.

13. No herbicide treatments will be conducted after July 31, in drainages that have documented bull trout spawning areas. Currently the streams are: Isabella Creek, upper Skull Creek (upstream of Snow Creek), upper Quartz Creek (upstream of Wolf Creek), upper Weitas Creek drainage (upstream of Middle Creek), Long Creek, Lake Creek, Rawhide Creek, Bostonian Creek, Placer Creek, Niagara Gulch, Vanderbilt Gulch, Osier Creek and North Fork Kelly Creek.

14. The Forest will have a Licensed Applicator directly supervising all herbicide treatments.

Field Preparation

1. A spill cleanup kit will be available at the temporary storage site and in all vehicles carrying herbicides.

2. Equipment used for transportation, storage, or application of herbicides shall be maintained in leak proof condition.

3. No herbicide mixing will be authorized within 100 feet of any live waters. Mixing and loading operations must take place in an area where an accidental spill would not contaminate a stream or body of water before it could be contained.

4. Only the quantity needed for the day's operations will be transported from the storage area.

5. In order to assure accurate spot treatment and facilitate monitoring, a spray dye will be added to herbicide mixes to be applied 15-100 feet from surface waters. The colorizer is easily seen by the applicator, which aides in the accomplishment of two objectives. The first is accurate application of the herbicide mix to the target weeds or weed areas thus limiting overspray to non-target plants or weed fee areas. Secondly, because treated areas are readily visible, it helps prevent repeat applications to previously sprayed weeds. The applicators will use a blue colorant which photo degrades in a period of approximately one week. This dye is added to the spray tank at approximately 8 fluid ounces per one-hundred gallons of water.

Chemical Applications

1. All pesticide labels will be strictly enforced and other restrictions include the following:

    a. Refer to Table 2 for maximum wind speed restrictions by herbicide application method.
    b. Do not spray if precipitation is occurring or is imminent.
    c. Do not spray if air turbulence is sufficient to affect the normal spray pattern.
    d. Do not spray if snow or ice covers the target foliage.

2. During application, weather conditions would be monitored hourly by trained personnel at spray sites (i.e., wind speed, temperature, relative humidity). Additional weather and application monitoring would occur whenever a weather change may impact safe placement of the herbicide on the target area.

3. Herbicide applications will only treat the minimum area necessary for the control of noxious weeds.

4. Herbicides will be applied by ground based multiple or single nozzle applications (truck or ATV).

5. Only ground based spot/selective applications of herbicides rated as having a low level of concern for aquatic species will be authorized from 15 to 100 feet from live waters or within riparian areas (which ever is greater). Authorized spray equipment will include pick-up and 4-wheeler mounted spray rigs, backpack sprayer, hand pump sprayer, hand-spreading granular formulations, and wicking (e.g., also includes wiping, dipping, painting, or injecting target species).

6. Application methods, appropriate buffers, and chemical restrictions listed in Table 2 will be followed.

7. No live water (e.g. ditches, streams, ponds, springs, etc.) will be sprayed with herbicides. Rodeo™ may be applied to areas within 15 feet of live waters.

8. Within 15 feet of live waters or areas with shallow water tables, only herbicides authorized for use are aquatic approved herbicides (i.e. Rodeo™) and methods of control would include backpack sprayer, hand pump sprayer, wicking, wiping, dripping, painting, or injecting.

9. All applications within 50 feet of live water will be directed away from surface water.

10. No spraying of picloram will be authorized within 100 feet of surface water.

11. Proposed clopyralid spraying within the 15-100 foot riparian zone will be conducted using methods that eliminate the application (direct spray or drift) within 15 feet of surface water. Application methods, such as the spray systems used by a contractor and the Forest during the 2003 and 2004 roadside noxious weed control programs (Appendix G) or other suitable methods may be used.

12. Manual control (e.g., hand pulling, grubbing, cutting, etc.) is authorized in all areas, and may be used in sensitive areas to avoid adverse effects to non-target species or water

quality. All noxious weed disposal will be in accord with proper disposal methods. Noxious weeds which have developed seeds will be bagged and burned.

Table 2. Buffers, maximum wind speed, application methods, and herbicide restriction associated with aquatic habitats, riparian areas and wetland resources.

Distance from surface water	Maximum Wind Speed	Herbicide Application Method	Herbicides Authorized
0 feet	N/A	Chemicals will not be used over water, including water standing or running in ditchlines.	None
<15 feet from surface water.	6 mph	Spot spraying of individual plants with aquatically approved chemicals. Ground based, single nozzle with handgun, wand, wicking or whipping.	Spot spraying of individual plants with aquatically approved chemicals (gyphosate-Rodeo).
15-100 ft from surface water	6 mph	Focused spraying of target species – may include area spraying when weed populations warrant (large patches of weeds, multiple patches in close proximity) Ground based, truck mounted multiple nozzle, ATV multiple nozzle system, single nozzle with handgun, wand, wicking or whipping.	Mixtures of chemicals may be used including those listed above and: gyphosate-Roundup, dicamba, 2,4 – D amine, triclopyr-TEA, and clopyralid
>100 feet from surface water.	10 mph	All appropriate ground application methods – includes spot spraying, focused spraying, or broadcast spraying as weed population warrant.	All chemicals listed above as well as picloram.

Project Monitoring

1. The project coordinator is responsible for the implementation monitoring which includes assuring the provisions listed above are followed and administrating actual chemical applications.

2. The forest fisheries biologist will be responsible for the effectiveness monitoring which evaluates if the above mitigation and BMPs were effective. The monitoring plan detailed in Appendix E will be conducted by designated personnel (fisheries biologist, hydrologist and biological technician). The overall objective of the project is to determine if streams and/or aquatic organisms have been exposed to herbicides used to control noxious weeds.

3. Water samples will be tested for the chemicals used. If levels above the No Observable Effect Concentration (NOEC) or their equivalent are found, further spraying will not occur in that watershed and application practices will be modified.

4. Annually, a treatment summary will be prepared for weed treatments that took place over the past year. The report will document treatments that took place, methods used, acreage, evaluation of achievement of objectives, brief summary of unexpected effects,

evaluation of compliance with this Biological Assessment and the aquatic monitoring results. The data for the report will be extracted from the Forest Service National Database. This summary report will be completed by December 31st.

5. Annually, a list of the acres planned for treatment in the upcoming year will be provided to the regulatory agencies to determine if the planned treatments are consistent with the effects analysis and determinations of the pending Biological Opinions.