Chapter 3
Existing Environment and Potential Effects

Introduction

This chapter presents the scientific and analytical basis for comparing alternatives. It provides information concerning the existing environment of the Indian Creek Road Reconstruction project area. Following each resource description is a discussion of the potential direct, indirect and cumulative effects of implementing each alternative. Where possible, effects are quantified and qualified. The means by which potential adverse effects will be reduced or mitigated are described.

The discussions of the existing environment and potential effects utilize information included in the Forest Plan, watershed analysis, project-specific resource reports and related information, and other sources as indicated. The planning record for the Indian Creek Road Reconstruction Project includes all project-specific information, resource reports and results of field investigations, and is available at the North Fork Ranger Station.

Water Quality

Affected Environment

The Indian Creek subwatershed is the analysis area for water resources. This area was selected because it encompasses the geographic area that could contribute to direct and indirect effects to watershed resources, as well as cumulative effects from the proposed road construction.

The proposed project is located in the Indian Creek subwatershed (Hydrologic Unit Code 170602030704) within the Middle Salmon-Panther Subbasin. Indian Creek is a tributary to the Salmon River and enters the river approximately ten miles west of the town of North Fork, Idaho. This perennial stream drains an area of approximately 54 square miles. Streamflows in the project area range from low flows of eight to ten cubic feet per second (cfs) to bankfull flows in the range of 100 cfs. Bankfull stream widths in the project area are in the range of 18 to 20 feet.

A water quality issue was identified for the proposed project because the road construction has the potential to adversely affect water quality by increasing sediment delivery to Indian Creek.

Sediment Yield

Two long-term monitoring stations are located on Indian Creek. One is located upstream from the project area below the confluence of the East Fork of Indian Creek and Indian Creek (Station 2A) and the second station is located below the project area near the mouth of Indian Creek (Station 1A). One of the parameters measured at these stations is the percent of fine sediment in the stream substrate. Percent fine sediment is a measurement of the quality of the stream substrate for fish spawning habitat. Percent fine sediment is also an indicator of the sediment loading to the stream system. Table 3.1 displays the percent of fine sediment measured at these stations from 1993 to 2003.

Table 3.1 Percent Fine Sediment

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Indian 1A	25.8	15.5	20.6	20.6	31.6	14.6	18.8	23.0	14.2	19.5	11.6
Indian 2A	10.8	14.2	20.6	21.5					12.0		17.0

The Forest Plan recommends 20 percent or less fine sediment by depth for anadromous fisheries and 28.7 percent fines by depth for resident fisheries. A review of the existing monitoring data shows that for most years both stations meet the goal of less than 20 percent fine sediment for anadromous streams. The spike in depth fines measured at Indian Creek 1A in 1997 reflects the increased sediment load to the stream from the road washout in the spring of 1997. The data shows that the fine sediments in the substrate were flushed during the 1998 spring runoff and sediment levels returned to normal levels. This rapid recovery displays the stream power of Indian Creek and its ability to recover from short-term sediment loads.

Water Quality and Beneficial Uses

Beneficial uses and water quality standards are designated by the State of Idaho. Beneficial water uses are designated according to the uses for which the water body is presently suitable or intended to become suitable based on water quality. Water Quality Standards are legally established rules consisting of three parts: designated uses, criteria to protect those uses and an antidegradation policy. These standards are listed in the "Water Quality Standards and Wastewater Treatment Requirements" (IDAPA 16.02.101.01).

Beneficial water uses in Indian Creek include: domestic water supply, agricultural water supply, cold water biota, Salmonid Spawning, primary contact recreation and secondary contact recreation.

Based on the available information all beneficial water uses are fully supported in Indian Creek. The State of Idaho has not identified Indian Creek as a water quality limited segment (303d stream) on either the current 1998 list or the proposed list for 2002.

Watershed Risk Assessment

The existing condition, watershed sensitivity and degree of management within a watershed or subwatershed affect the potential to experience adverse effects to watershed and aquatic resources. As a general rule, the probability of experiencing adverse effects increases as the percentage of the watershed affected by management actions or natural disturbances increases. A watershed risk assessment process is presented in the document "Determining the Risk of Cumulative Watershed Effects Resulting from Multiple Activities" (USDA, Forest Service, 1993). In this assessment process road density and percent of the watershed covered with "hydrologically immature" vegetation are used as indicators of potential effects on water yield and timing as well as erosion and sediment potential.

Past management actions and natural disturbances in the Indian Creek subwatershed include timber harvest, road construction, mining, prescribed fire, wildfire and livestock grazing. Timber harvesting has occurred on 448 acres within the subwatershed in the last 30 years. Prescribed fire within the watershed has occurred on a total of 5578 acres since 1988. Most of the prescribed fires were low intensity fires with little overstory mortality. Wildfire within the subwatershed has occurred on 2205 acres since 1982. All of the wildfires were classified as moderate severity fires with variable overstory mortality.

A process described in the report "Method for Predicting Increases in Water Yield Related to Timber Harvesting and Site Conditions" (Galbraith, 1975) can be used to convert acres of partial timber harvest to equivalent clearcut acres (ECA). A similar process has been used to convert burned areas to ECA based on determinations of overstory mortality by fire severity class from the Clear Creek Fire. Using these processes the total ECA for Indian Creek at this time is 1988 equivalent clearcut acres or 5.7 percent of the watershed.

Roads within the subwatershed have been constructed for timber harvest, mining and private land access. There is a total of 73.6 miles of road within the subwatershed resulting in a road density of 1.4 miles per square mile.

Based on a road density of 1.4 miles per square mile and 5.7 percent of the watershed with stands less than 30 years old the Indian Creek Subwatershed has a Low Risk of cumulative watershed effects (USDA, Forest Service, 1993).

Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

This alternative would continue with the current management in the Indian Creek subwatershed. The short segment of Indian Creek Road would not be reconstructed. Ground cover conditions, surface runoff, water yield and sediment delivery to Indian Creek in the project area would remain essentially the same as the current conditions. Watershed conditions would remain essentially the same unless a wildfire or other disturbance occurred in the area. The existing beneficial water uses would continue to be fully supported.

Cumulative Effects

Timber harvest, mining, wildfires and prescribed fire have occurred in the Indian Creek subwatershed. These activities equate to a total of 1988 Equivalent Clearcut Acres (ECA), 73.6 miles of road and a road density of 1.4 miles per square mile. Ongoing activities include livestock grazing, firewood harvesting, dispersed recreation, weed treatment, private land development, water use, fish habitat restoration, fish propagation and administrative activities at the Indianola Helibase. These activities have the potential to effect water yield and water quality. The ECA described above includes the effect of these activities on changes in vegetation. Roads necessary for these activities are included in the road miles and road density.

Proposed future activities in the subwatershed include prescribed fire projects. Past-prescribed fires in the subwatershed have been predominately low severity with little overstory mortality. Of the 5578 acres of prescribed fire that has been conducted in the analysis area 86 percent has been low severity (less than 20 percent stand replacing fire), eight percent has been moderate severity (20-80 percent stand replacing fire) and six percent has been high severity (greater than 80 percent stand replacing fire). To assess the potential cumulative effects of the proposed prescribed fire project it is assumed that these projects would have a similar range of fire severity. A conversion factor for ECA based on the percent stand mortality for various fire severity classes was developed on the Salmon-Challis National Forest after the Clear Creek Fire in 2000. Using these conversion factors the proposed prescribed fires would have approximately 184 ECA. This would increase the percent of the watershed in stands less than 30 years from 5.7 percent to 6.3 percent.

There is also a potential for additional private land development within the watershed but no specific projects or proposals for development are known at this time. The Idaho Department of Lands (IDL) has been contacted to see if they are aware of any proposals for logging on private land in the analysis area. At this time IDL has not received any plans for timber harvest in the Indian Creek subwatershed. Though a potential exists for cumulative effects on water quality from private land activities there no specific activities to evaluate at this time.

Based on the ECA and road density for past, ongoing and proposed activities within the subwatershed, Indian Creek has a Low Risk of cumulative watershed effects (USDA, Forest Service, 1993).

Alternative B

Direct and Indirect Effects

Sediment Yield

The right-of-way clearing and road construction has the potential for sediment production and delivery to Indian Creek. To assess this potential a field review of the proposed road disturbance area was completed in the summer of 2003. During the field review measurements of the width of the undisturbed slope, between the lower end of the road clearing and Indian Creek, was conducted to determine appropriate Best Management Practices (BMP) to incorporate into the road design to minimize sediment delivery to Indian Creek. The width of the undisturbed slope below the new road segment varies from 6 to 300 feet above the ordinary high water elevation of Indian Creek. In some segments there is a flat below the disturbance that would provide an adequate sediment filter. However in several locations there is neither a flat slope nor adequate vegetative filter to prevent sediment delivery to Indian Creek. Because of the inadequate filter strip below the road disturbance the following BMP have been included in the project design to minimize sediment delivery to Indian Creek.

- Construct a filter slash windrow at the bottom of the road fill slope. Felled trees from the right-of-way clearing will be placed against standing trees below the new road to create an anchor point for the slash windrow. Felled trees should be limbed on one or two sides so that there is good ground contact. Limbs and brush will be placed upslope behind the anchor tree.

- Cut and fill slopes will be seeded with a native seed mix and mulched with a weed-free straw.

- In locations where there are not standing trees to anchor the slash windrow an alternate physical barrier, such as coir logs or straw waddles, will be installed to trap sediments from the disturbed area.

Placing riprap along approximately 175 feet of streambank will reduce streambank erosion and sediment delivery to Indian Creek. Excavation of the hump in the road for borrow material, if necessary for road construction, should have a negligible effect on water quality. This proposed borrow area is located away from Indian Creek with a good vegetative filter strip between the borrow area and the stream.

Sediment delivery to Indian Creek from the road construction should be very minimal with the proposed BMPs. Implementation monitoring reviews conducted on the Forest have demonstrated that filter slash windrows are highly effective in trapping sediment produced from road construction (USDA Forest Service, 1998).

Water Quality and Beneficial Uses

Adverse effects to water quality would be minimal and short term. Effects on stream substrate sediment levels should be negligible. The monitoring data for Indian Creek supports this determination.

A review of the monitoring data for Indian Creek (Station 1A) shows that substrate sediment levels returned quickly to normal levels following the road washout in 1997. The data shows that the fine sediments in the substrate were flushed during the 1998 spring runoff and sediment levels returned to normal levels. This rapid recovery displays the stream power of Indian Creek and its ability to recover from short-term sediment loads. The potential sediment delivery to Indian Creek from the proposed road construction is negligible compared to the sediment loading from the road washout in 1997.

As designed the proposed road construction should have very minor effects to water quality. State water quality standards and beneficial water uses would continue to be fully supported.

Watershed Risk Rating

Watershed Risk Ratings are a part of the cumulative effects analysis. The existing condition, watershed sensitivity and degree of management within a watershed or subwatershed affect the potential to experience adverse effects to watershed and aquatic resources. As a general rule, the probability of experiencing adverse effects increases as the percentage of the watershed or subwatershed affected by management actions or natural disturbances increases. Based upon a watershed risk assessment presented in the document Determining the Risk of Cumulative Watershed Effects Resulting from Multiple Activities (USDA, Forest Service 1993), road density and percent of the subwatershed covered with "hydrologically immature" vegetation are used as indicators of potential effects on water yield and timing as well as erosion and sediment potential.

Roads can affect hydrologic functions and resultant water quality by altering groundwater interception, runoff distribution over time and space, and the potential for sediment production and delivery to streams. The risks of a road affecting water yield and/or quality are largely determined by location, maintenance level, dimensions, and surfacing. Road density expressed as miles per square mile provides an index of the overall potential for roads to affect watershed function. In general, watersheds (or subwatersheds) with less than 30 percent watershed relief and road density of three miles per square mile or less are considered to have a low risk for the overall potential for roads to affect watershed function. Watershed relief was calculated for all subwatersheds in the project area and all had watershed relief less than 30 percent.

Young stands, resulting from harvest or natural ecosystem components such as fire or disease, are indicative of the potential effects on the magnitude and timing of runoff from the watershed. The term "hydrologic immaturity" is used to indicate forested stands in which root structure and canopy density have not reached the level of water use and influence created by mature stands.

For this analysis, hydrologic immaturity is represented by forested stands that are less than 30 years old. The percentage of the subwatershed in stands less than 30 years old is analyzed to determine if there is a substantial risk of stream channel erosion from increased water yields.

A process described in the report "Method for Predicting Increases in Water Yield Related to

Cumulative Effects

The effects of past, ongoing activities and future projects within the Indian Creek subwatershed are discussed in Alternative A.

Other future activities include this project proposal and proposed road construction on private land. If the new road segment is constructed to restore public access to Indian Creek there is a proposal from the Indian Creek Guest Ranch to construct a new road segment on their property to reduce traffic near the guest facilities. Approximately 1200 feet of new road is proposed to be built on the ranch across a relatively flat, irrigated pasture between the existing road and Indian Creek. Because of the flat ground and the good vegetative conditions in the irrigated pasture sediment delivery to Indian Creek from this proposal should be minimal.

Water quality data integrates the effects of all past and ongoing activities within the subwatershed on sediment levels in Indian Creek. As previously discussed, beneficial water uses and state water quality standards are currently being met in Indian Creek. The proposed road construction on Forest and on the Indian Creek Guest Ranch (total of 2360 feet) should have a minimal short- term effect on water quality in Indian Creek. State water quality standards and beneficial water uses would continue to be fully supported.

Road miles within the subwatershed would increase from 73.6 miles to 74 miles with the proposed road construction on the Forest and on private land. Road density would remain unchanged at 1.4 miles per square mile.

ECAs from the past, ongoing and proposed projects would be 1988 acres or 5.7 percent of the Indian Creek subwatershed.

Based on the ECA and road density for past, ongoing and proposed activities within the subwatershed, Indian Creek has a Low Risk of cumulative watershed effects

Public Access and Safety

Affected Environment

The Forest Service is managing the Indian Creek road (FS rd #036) as a multi-jurisdictional road. The Forest Service recognizes Lemhi County has filed assertion on the Indian Creek road for RS2477, but there has been no adjudication defining the ownership of the road. Until the courts define ownership of the entire Indian Creek road the Forest Service will retain responsibility for

maintenance and reconstruction needs on the Indian Creek road through National Forest System Lands. The Forest's current operational maintenance level for the Indian Creek road is Level 2 – Suitable for high clearance vehicles. The National Forest System Lands accessed by the Indian Creek road have management emphasis on Anadromous Fisheries, big game winter range and moderate levels of timber management. Private landowners and recreationists also use the Indian Creek road.

During the spring snowmelt of 1997 and associated runoff event, natural channel obstructions caused Indian Creek to drop its bedload and fill up a short reach of the existing channel. This obstruction caused the stream to change course and flow down the adjacent road that was located in the floodplain.

Approximately 700 feet of Indian Creek Road washed out during the spring 1997 snowmelt runoff. The washed out portion of the road is on National Forest System (NFS) land, but was not immediately replaced because access was is dispute where the road passed through private property.

Since 1997 the status of the Indian Creek Road has been in litigation in the courts. On December 27, 2002 the Idaho Supreme Court determined Indian Creek Road to be a public road.

Because the Indian Creek road is being managed as a multi-jurisdictional road it has three Roads Management Objectives (Appendix D) for the road section through National Forest System lands. The Indian Creek road Roads Management Objectives direction for all three-road sections state:

- **FLRMP Area Direction:** Areas serviced by this road have management emphasis on Anadromous Fisheries, big game winter range and moderate levels of timber management.
- **Travel Plan Direction:** Area is open to motorized travel.
- **PACFISH/INFISH Direction:** Outsloping of road is preferred drainage except where this compromises safety, is infeasable or increases sediment delivery to streams. Provide and improve fish passage at stream crossings of potential fish bearing streams. Design for 100 yr. event.
- **Environmental Considerations:** Adjacency to streams (Indian Creek) is primary concern. Disturbance to wintering big game, spread of noxious weeds may also need to be considered.

All three-road sections have the following design elements:

- 1 lane road
- 14 foot normal road width
- 50 foot minimum curve radius
- 1 lane turnout approximately every 1750 feet
- Maximum desirable or sustained road grade of 4-6 percent

- Maintain clearing for sight distance and lateral clearance

All three-road sections have the following operational criteria:

- Forest Service has jurisdiction and primary maintenance responsibilities
- Objective maintenance level 3 – suitable for passenger cars
- Operational maintenance level 2- suitable for high clearance vehicles
- Those bridges not meeting Idaho Highway legal load ratings will be posted with load restrictions and a permit would be required for bridge overload

Indian Creek Road has six stream crossings on Indian Creek. Currently five of the six stream crossings do not meet Idaho Highway Legal Load Ratings (Appendix C). All six of the Indian Creek bridges are of the same type design, called nail laminated, in which the deck is constructed of 2" x 12" treated timber boards which are set on edge and nailed together to construct a 14 foot wide, 12" thick slab. Now that the Right of Way issue has been resolved, engineering is planning to go out in fiscal year 2004 to scrape off the surfacing so all the structures can be thoroughly evaluated and a long term strategy regarding the bridges can be determined. At that time, the load ratings will be reevaluated based on the findings of the inspection.

Environmental Consequences

Alternative A – No Action

Direct and Indirect Effects

The road washout would remain and the Forest Service Roads Management Objectives for the Indian Creek road would not be met.

Cumulative Effects

Without the road reconstruction project there is a high risk of cumulative impacts to water quality and fisheries resources associated with non-authorized motorized use in Indian Creek around the washout.

Alternative B

Direct and Indirect Effects

The road reconstruction project would allow for the Forest Service Indian Creek road Roads Management Objectives to be met. The road reconstruction project would also:

1. Meet the direction of the Idaho Supreme Court Ruling.
2. Provide public land access for recreation, hunting, fishing, and firewood gathering.

3. Provide access to 500 acres of private land using the Indian Creek Road. Using the Indian Creek road would be less limiting to certain types of vehicular traffic, provide a longer access season to the private and public land above the washout, allow for the delivery of needed supplies to private landowners and enhances private landowner's emergency medical and law enforcement services.
4. Provide Forest Service motorized road access for administrative purposes, including for wildfire suppression, to National Forest System Lands above the washout.

Cumulative Effects

The road reconstruction project would provide easier access to the upper Indian Creek drainage. This improved access will account for an increase in Indian Creek road traffic over existing conditions today. This increase in traffic will be for access to both private and public lands. This road reconstruction project will have a cumulative effect associated with future activities that may occur in the Indian Creek subwatershed (Table 1.2). These cumulative effects will not adversely affect the resources analyzed within this document.

Noxious Weeds

Affected Environment

The entire Indian Creek drainage is the analysis area.

Spotted knapweed has been observed within the Indian Creek area since the early 1980s. It is established on suitable sites within the entire drainage, and particularly well established along most road and travelways, trails, and upland sites that have been subjected to disturbance. Of perhaps greatest concern is the spread of knapweed within healthy wildlands adjacent to and extending some distance away from roads.

Spotted knapweed occurs as scattered patches along the entire Indian Creek Road. These patches persist along the road within the project area with very few established plants in the vicinity of the proposed road construction activities. Infestations located immediately off road are somewhat limited by shade within dense conifers with well developed understories and lack of disturbance. However, knapweed has become well established in numerous patches that extend upslope in open grassland.

Forest and grassland areas at low to mid-elevations contain habitat types most extensively invaded by noxious weeds in the northern Rocky Mountains. Vegetation types such as foothills grassland (including bluebunch wheatgrass and idaho fescue), and mixed xeric forest savannah (including ponderosa pine, Douglas-fir, bluebunch wheatgrass, idaho fescue, rabbitbrush, and other deciduous shrubs), are similar to those found within the proposed project area, and have been identified as most at risk to invasion by spotted knapweed and other noxious weeds (Losensky 1987).

Data from the *Scientific Assessment from the Interior Columbia Basin Ecosystem Management Project* (Quigley et al 1996*)* describe the susceptibility of various habitats to invasion by noxious weeds and other exotic species. Vegetation types within the proposed project area have been rated as having a high susceptibility (warm forest with ponderosa pine, riparian, and dry grassland) or moderate susceptibility (cool Douglas-fir types and dry shrublands) to invasion by spotted knapweed (USDA Forest Service, 1997). A high rating indicates the vegetation type is inherently susceptible to invasion by exotic species even in the absence of intense or frequent disturbance. A moderate rating indicates the exotic species is a successful invader because disturbance removes the normal canopy cover, and/or creates bare, mineral soil.
Noxious weed control activities are disclosed in the Salmon National Forest Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) (June 1987), and in an addendum (March 1988) to the Forest EA. The EA is tiered to the Final Environmental Impact Statement for the Intermountain Region Noxious Weed and Poisonous Plant Control Program (October 1986). Noxious weed control activities as disclosed in the EA/FONSI (1987) are incorporated by reference into the Indian Creek Road Reconstruction project EA.

Environmental Consequences

Analysis Methods

Data gathered to support this analysis was obtained from field reviews and surveys from 1991 to present throughout the Indian Creek drainage.

Alternative A – No Action

Direct and Indirect Effects

Areas already colonized by noxious weeds will naturally increase in size unless treated. This is particularly true along roadways and other disturbed sites, especially when the adjacent habitat types are susceptible to invasion. Weed density may also increase depending on the resistance of the existing vegetation.

Cumulative Effects

Areas subjected to invasion by noxious weeds will likely increase unless control measures are implemented. A change in species diversity together with a potential replacement of established desirable vegetation along roadsides may occur over the long term. This situation can produce adverse impacts on watershed quality by the replacement of desirable species that help control erosion along roadways and within upland sites (Lacey et al 1989). Long term impacts to erosion control and watershed quality may be at risk.

The risk of noxious weed spread and subsequent colonization of adjacent upland native communities is also of concern. Areas are steadily being converted from native plant communities to those dominated by exotic species. A few decades of landscape level impacts will likely include degraded and/or decreased forage available for wildlife and livestock, decreased species diversity, increased risk of additional invasion by exotics and subsequent changes in recreational use patterns.

Alternative B

Direct and Indirect Effects

Initially, the risk of potential importation and/or spread of existing noxious weed populations will likely increase above the natural rate of expanding weed populations due to ground disturbing activities associated with tree removal and road construction. In particular, the risk of weed spread to the proposed road development site where knapweed is not well established is of concern. Ground disturbance is likely to expose buried knapweed seeds to conditions of light and moisture that favor germination. This is of special concern because knapweed seeds are viable in the soil for long periods of eight to ten years. Weed seeds can then be easily transported throughout the project area on equipment, personnel, and wildlife, and facilitate weed spread. However, infested acres within the project area are not anticipated to increase with the implementation of the proposed project design due to the inclusion of preventative and/or control measures.

Cumulative Effects

All actions, except the proposed action (Table 1.2), have the potential to impact the spread of noxious weeds and will continue to do so unless preventative and/or control measures are implemented. Of these actions, only the proposed action and noxious weed treatment activities are likely to reduce weed density and spread in select areas. Areas subjected to invasion by noxious weeds will likely increase unless control measures are implemented. A change in species diversity together with a potential replacement of established desirable vegetation along roadsides may occur over the long term. This situation can produce adverse impacts on watershed quality by the replacement of desirable species that help control erosion along roadways and within upland sites (Lacey et al 1989). Long term impacts to erosion control and watershed quality may be at risk.

The risk of noxious weed spread and subsequent colonization of adjacent upland native communities is also of concern. Areas are steadily being converted from native plant communities to those dominated by exotic species. A few decades of landscape level impacts will likely include degraded and/or decreased forage available for wildlife and livestock, decreased species diversity, increased risk of additional invasion by exotics and subsequent changes in recreational use patterns.

Fisheries

Affected Environment

The fisheries analysis area is considered the Indian Creek drainage, which includes the Proposed Project Area, and the Salmon River.

Indian Creek is a 4th order perennial fish-bearing stream. Indian Creek provides spawning and rearing habitat for federally listed ESA Endangered, Threatened, and Region 4 Regional Forester's Sensitive fish species. Federally listed or proposed listed fish species occurring within the analysis area include the "Threatened" Snake River spring/summer chinook salmon (Oncorhynchus tshawytscha), the "Endangered" Snake River sockeye salmon (Oncorhynchus nerka), the "Threatened" steelhead (Oncorhynchus mykiss), and the "Threatened" bull trout (Salvelinus confluentus). The one Region 4 Regional Forester's designated sensitive fish species occurring within the project area is the westslope cutthroat trout (Oncorhynchus clarki lewisi).

On February 2, 2004 the Salmon-Challis National Forest amended the Forest Plan Management Indicator Species (MIS) list in order to improve its reliability, efficiency, and cost-effectiveness in meeting information needs for the biological effects of active management. The MIS fish species selected for the aquatic habitat/community type is the bull trout. Forest bull trout population data and habitat trends are currently available and protocols exist for collection of scientifically credible data. Since being listed as a "Threatened" under the Endangered Species Act, bull trout and their habitat have been intensively monitored throughout the Forest. The data collected has followed well-established protocols for electro-fishing, snorkeling and redd counts. Bull trout occur in streams within virtually all-coniferous forest communities, which are subject to resource management activities, including timber and grazing. They are known to be sensitive to stream habitat and watershed alterations.

In November 2004 the Salmon-Challis National Forest published on the Forest Internet Web Page http://www.fs.fed.us/r4/sc/projects/mis/bull_trout_110904.pdf the status report for bull trout.

Table 3.2 Estimated Population and Habitat Trends on the Salmon-Challis National Forest for selected MIS

MIS	Population Trend	Rationale	Habitat Trend	Rationale
bull trout	Stable to Slightly Increasing	There is relatively little long-term population trend data. However based on Forest wide population data collected since 1997 (electrofishing, snorkeling, and redd surveys) bull trout populations would be considered stable to slightly increasing	Stable to Increasing	Based on implementation of Forest wide stream/riparian habitat and watershed restoration activities since the 1980's. Also, based on implementation of PACFISH/INFISH including Riparian Management Objectives bull trout habitat trends would be considered stable to increasing.

Three watershed biological assessments (BAs) have been completed for the Lower Salmon. This analysis tiers to those three watershed BAs and the environmental baseline conditions as described in them. The BAs were for sockeye and chinook salmon (*Lower Salmon River Section 7 Watershed BA Package for Sockeye and Chinook salmon,* May 1993), bull trout (*Lower Salmon River Section 7 Watershed BA Package for Bull Trout*, June 1998), and steelhead (*Lower Salmon River Section 7 Watershed BA Package for Steelhead*, January 2000).

The May 1993 Forest Service Lower Salmon River Section 7 Watershed BA package for sockeye and chinook salmon indicates Indian Creek has limited quality spawning and rearing habitat. The June 1998 and the January 2000 Forest Service's Lower Salmon River Section 7 Watershed BA packages for bull trout and steelhead, respectively, states limiting factors for spawning and rearing steelhead populations include the lack of large woody debris and the lack of quantity and quality of pools.

Indian Creek has a mean width of 14.75 feet and a mean max depth of 2 feet. Indian Creek drains an area of 54 square miles and has a mean annual flow of 27.5 cubic feet per second.

Aquatic surveys have been conducted in the North Fork Salmon River watershed since 1991. Surveys used to collect data include the *R1/R4 Stream Habitat Inventory*, *GAWS Level III Stream Ecosystem Baseline Survey,* electro-shocking for fish presence, sedimentation surveys and water temperature monitoring.

The fisheries data files used in the analysis of this proposed project are stored and maintained on the North Fork Ranger District.

Stream Habitat

Critical habitat for threatened chinook salmon has been designated in the project area. Critical Habitat for bull trout has been Proposed for Indian Creek.

A summary of the R1/R4 Stream Habitat Inventory for 3.3 miles (Reach 1) of Indian Creek can be seen in Table 3.3. The existing habitat conditions indicate Reach 1 of Indian Creek is below a Desired Condition and is significantly deficient in both pools/100m and large woody debris (lwd/100m).

Table 3.3 Summary 1994 R1/R4 Stream Habitat Inventory Data for 3.3 miles of Indian Creek

Stream Name	Reach Type	Length (m)	Mean Width (m)	Pools/100m & % Pools	LWD/100m	Mean % Stable Banks	Mean % Undercut Banks	Mean % Surface Fines
Reach 1	B	5319	4.5	1.32 / 10.6%	8.20	99.50	1.60	13.1
Natural Condition	(Desired Condition)			3.87	17.25			

Fish Presence/Absence Data

Since 1997, the North Fork Ranger District has partnered with Idaho Fish and Game Region 7 collecting fish presence/absence and population data. Juvenile chinook salmon, rainbow trout/steelhead, bull trout, westslope cutthroat trout, mountain whitefish, sculpin and tailed frogs are present within the fisheries analysis area. Field reviews since 1999 indicate no salmonid spawning habitat exists adjacent to the proposed road reconstruction area.

Stream Temperature

Indian Creek has stream temperature data that has been collected from 1993 to present. The analysis of the stream temperature data, at present, supports the conclusion that stream temperature is not a limiting factor for resident and anadromous fish in Indian Creek.

Sedimentation

Stream sedimentation is discussed under the Water Quality section on page 3-2. Forest Plan anadromous goals for percent fines are less than 20 percent mean depth fines.

Environmental Consequences

In analyzing effects on fish species, the primary considerations are sedimentation of stream substrates, degradation of riparian area integrity, water quality, impairment of fish migration opportunities, modification of stream channel integrity, and large woody debris recruitment.

Alternative A – No Action

Direct and Indirect Effects

- Current stream habitat trends and natural fluctuations in stream flow timing and magnitude would continue. Although changes may occur, they would be in response to natural events. Continued natural trends and fluctuations in channel morphology are also expected.
- Fish distribution and densities are expected to remain near current conditions.
- Stream temperatures have been determined not to be a limiting factor for fish populations in Indian Creek. Water temperature of the streams would continue to fluctuate naturally because no change in stream habitat conditions or riparian/upland habitats would occur because of human activities.
- Continued natural trends and fluctuations in percent fines by depth are expected because no change in stream habitat conditions or riparian/upland habitats would occur because of human activities. Although changes may occur, they would be in response to natural events.

Alternative B

The activities associated with the Proposed Indian Creek Road Reconstruction Project follow the standard and guidelines and Best Management Practices (BMPs) for road construction activities as set forth in the Forest Plan as well as set forth in the Forestry BMP's for Idaho (2000). The project will also follow all BMPs associated with the Army Corps of Engineers Permit. These BMPs and standard and guidelines are designed to address and minimize or eliminate potential stream sedimentation, fish migration impacts, and riparian impacts to fisheries resources associated with stream and streambank disturbance activities.

Direct and Indirect Effects

- The project as designed and planned would maintain or restore the measurement indices of width-to-depth ratio, large woody debris, and pool frequency. There would be no ground disturbing activities that would be introducing measurable amounts of sediment into stream channels. There would be sediment traps and filter strip designed to intercept potential sediment delivery to Indian Creek. The road construction activities are designed to minimize and prevent road sediment delivery to stream channels.
- Fish species presence and population tends. There would be no activities degrading fish habitat parameters or having a negative impact directly or indirectly on the fish species.

- Stream sediment percent fines by depth would be maintained. There would be no ground disturbing activities that would be introducing measurable amounts of sediment into stream channels.
- Stream temperature would be maintained since insignificant timber removal will occur within the PACFISH/INFISH RHCAs

The design of the proposed action and the implementation of all of the general and site specific standard and guides and BMPs for the Indian Creek Road Reconstruction Project's proposed activities will ensure that: 1) sediment generated as a result of ground and streambed disturbing activities is both minimized and/or intercepted before entering Indian Creek, 2) riparian integrity is maintained and restored to ensure adequate shading, ensure future large wood debris recruitment is maintained and restored, and retention of protective overhead cover is maintained and restored, 3) activities do not negatively impact physical or chemical immigration or emigration opportunities, and 4) Idaho State Water Quality standards for coldwater biota and salmonid spawning are met or exceeded.

The proposed project meets the goals, objectives, and standard and guidelines as described in PACFISH/INFISH, and the proposed project will have no measurable affect on ESA listed fish and the Indian Creek's limited spawning and rearing habitat for the chinook salmon, steelhead, bull trout, and westslope cutthroat trout.

There will be no measurable impacts to any fish species or the above habitat elements/attributes associated with the proposed Indian Creek Road reconstruction because of the project's design and associated management requirements.

Based on the fact the proposed project will meet the goals, objectives, and standard and guidelines described in PACFISH/INFISH, as well as the scope and magnitude of the project, and the design and management requirements there will be no effect on the federally listed endangered Snake River sockeye salmon or the mainstem Salmon River and no effect on the federally listed threatened Snake River spring/summer chinook salmon, threatened steelhead, threatened bull trout and their spawning and rearing habitat in Indian Creek or the mainstem Salmon River. The project will not result in the destruction or adverse modification of designated Critical Habitat or Essential Fish Habitat for the Snake River sockeye salmon and Snake River spring/summer chinook salmon. The project will not destroy or modify bull trout proposed critical habitat.

In addition Indian Creek Road reconstruction will have no effect on the westslope cutthroat trout R4 sensitive fish species or their habitat.

Cumulative Effects

Past, present and future activities that have occurred in the Indian Creek subwatershed (Table 1.2) have the potential to effect fish and fish habitat. Previous analyses in Watershed Biological Assessments have indicated a lack of large woody debris and a lack of quantity/quality pool habitat as the limiting factors in Indian Creek for coldwater salmonid populations. The private

land activities adjacent to the project area are considered to have cumulative effects but are not expected to have an adverse or measurable impact on fish and fish habitat within the project area.

Past, present and future activities on private, state and federal lands will have no measurable negative cumulative impacts on bull trout and their habitat within the project area and fisheries analysis area.

Bull trout have many activities that are considered threats to their populations and their habitat. These activities in the analysis area consist of timber harvest, road development, fish passage barriers, livestock grazing, mining, water diversions, unscreened irrigation diversions, urbanization, and recreation. The current distribution and abundance of bull trout suggests the activities that are considered threats to their population and their habitat may degrade habitat conditions or depress bull trout populations. However, increased environmental awareness and technical knowledge have stimulated the development of management practices designed to protect water quality, protect riparian habitats and restore bull trout populations and habitat conditions.

Wildlife

Affected Environment

The entire Indian Creek drainage is the analysis area.

The proposed project area is largely deciduous riparian with established stands of Douglas-fir and ponderosa pine. These small conifer stands are generally not continuous, and open areas dominated by cottonwood, alder, dogwood, and willow are found. The tall shrub layer is well developed with understories composed of oregon grape and dense patches of rose. This multi-layered canopy provides a structural diversity that is an important wildlife habitat component. Habitat is available for a variety of big game species, including elk, mule deer, black bear, moose and mountain lion. Small game such as blue and ruffed grouse, and a variety of nongame wildlife, including neo-tropical migratory birds, raptors, and other bird and small mammal speices, are also found throughout the area.

Riparian zones in their entirety contribute to the overall biodiversity of an area. In addition to being a source of free water, riparian zones function as resting, foraging, nesting, security and overwintering sites for a variety of species including big game, pine marten, bobcat, goshawk (R4 Sensitive), pileated woodpecker (MIS), and ruby-crowned kinglet. During severe winters, riparian zones provide critical big game winter range. The importance of maintaining these areas as migratory corridors for birds, such as swainsons thrush, western tanager, and vesper sparrow, can significantly contribute toward maintaining populations of these species.

Snags are another important component of wildlife habitat. Snags provide foraging and nesting habitat for a variety of non-game birds such as mountain bluebird, and northern flicker, and mammals including forest dwelling bats and flying squirrel. Habitat is available for several cavity dependent species within the project area including black-capped and mountain chickadee,

violet-green swallow, american kestrel, and red-breasted nuthatch. Snags are generally limited in the project area.

Winter Range
Winter ranges provide critical thermal cover and foraging habitat for elk, deer, moose and other wintering wildlife. Management of these ranges is the single most site specific consideration for elk habitat (Christensen et al 1993). Optimum cover blocks on spring-summer-fall ranges are thirty to sixty acres in size with a 70 percent crown closure but big game are known to use areas with less canopy cover on winter ranges. Multi-storied stands are better thermal cover than single-storied stands, however, any cover is better than no cover (Thomas et al 1979). Stands that serve as cover habitat interspersed throughout the project area together with the native bunchgrass communities (largely bluebunch wheatgrass and Idaho fescue), are important to maintain wintering big game populations. Cover areas become especially important to big game and the maintenance of these herds because much of the Indian Creek drainage is accessible by road and is open to general season deer and elk hunting.

Big game use of the proposed project area is considerable, and winter population counts conducted by Idaho Department of Fish and Game since 1988 have consistently located elk and deer within subunits that extend up to an elevation of 6400 feet. These data indicate a significant number of big game wintering in this area (IDFG unpublished data).

Threatened, endangered and sensitive species
Habitat for federally listed threatened and endangered species including the gray wolf is available. The project area provides limited, if any, habitat for the bald eagle and is not mapped as suitable habitat for Canada Lynx. Limited habitat for USFS-R4 designated sensitive species including harlequin duck and northern goshawk is also found in the proposed project area. Habitat for the spotted frog is largely unavailable.

Management indicator species (MIS)
The following vertebrate species represent the wildlife listing of MIS for the Forest; pileated woodpecker, greater sage-grouse, and columbia spotted frog. Few habitat components exist in the project area for pileated woodpeker. Habitat is largely unavailable and unsuitable within the proposed project area for greater sage-grouse, and columbia spotted frog.

The pileated woodpecker is an ecological indicator for mature and old growth (late seral) ponderosa pine and Douglas-fir habitats, especially those in multistoried condition. This species is largely dependent upon snags and large diameter (greater than 20 inches) trees with cavities for nesting and roosting activities, and standing snags and downed logs for foraging activities. Dense coniferous forest identified as nesting habitat for the pileated woodpecker is generally not available, as conifer species persist in patches along Indian Cr and are intermixed with deciduous species. Large, standing snags suitable as nest sites are not available. Very limited foraging habitat is available with very few standing stumps, and a lack of downed logs.

Pileated woodpeckers are considered common where suitable habitats exist across the Forest. Individual observations have been recorded and included within the NRIS/FAUNA database**.** This species has only been detected on four of seven Breeding Bird Survey (BBS) routes and

very few times on those routes. Permanent monitoring transects using point count techniques were established on all Ranger Districts during April 2004. Pileated woodpeckers were detected on all Districts except the Lost River and Middle Fork. The proposed project area was searched for evidence of pileated woodpecker feeding and nesting activities during April and October 2003; no such activities were identified. District surveys were completed for this species during April 2004 in areas outside of the project area, and pileated woodpeckers were found. Incidental observations of this species on the North Fork District from the late 70s to present indicate that pileated woodpeckers have been found in coniferous and riverine habitats (unpub data, District project file).

There are no known population trends for pileated woodpeckers within the Central Idaho Mountains Ecological Resource Unit (ERU), other than the Breeding Bird Survey data and some limited surveys related to project analyses. However, Wisdom et al. (2000) estimates an increase of 21 percent in source habitat, from historical to current times, for this species within the Central Idaho Mountains ERU, which includes essentially all of the Salmon-Challis Forest.

Although the Forest BBS data are not sufficient to indicate population trend, they indicate whether the pileated woodpecker was detected on that particular route. Together with other BBS routes in Idaho, these data can display statewide population trend. Nationally, this portion of the Northwest shows a long-term upward trend of greater than 1.5% per year over a 30-year period (1966-1996). Data for Idaho indicate an upward trend of 3.5% per year over the same period (USFS 2004).

Environmental Consequences

Analysis Methods
Data gathered to support this analysis were obtained from field reviews and surveys from 1991 to present.

Alternative A
Direct and Indirect Effects
This alternative would sustain current habitat conditions for wildlife, including winter range, threatened, endangered and sensitive species and management indicator species (MIS)

Cumulative Effects
This alternative would continue to sustain current habitat conditions for wildlife, including winter range, threatened, endangered and sensitive species and management indicator species (MIS)

Alternative B
Direct and Indirect Effects
Some wildlife species such as birds and small mammals may be temporarily displaced due to disturbance activities. Because large scale changes in habitat will not occur, the status of

wildlife species and the habitats that support them will not be significantly influenced by the implementation of this alternative. Little impacts, if any, are anticipated for cover habitat and no measureable effects are anticipated to winter range.

Threatened, endangered and sensitive species
A determination of no effect was obtained from information analysed in the Biological Assessment. This project was determined to not jeopardize the continued existence of the Central Idaho wolf population and/or the ability of the available habitat to support wolves. A finding of no impact and no trend toward Federal listing or reduced viability for the population or species was obtained from the Biological Evaluation regarding anticipated impacts to these species as a result of the proposed project activities.

Management indicator species (MIS)
Habitat for pileated woodpecker will not be substantially impacted by this project. Of approximately 30, 703ac of coniferous habitat within the Indian Cr drainage (88.5% of the drainage), only 0.7ac, or a trace of coniferous habitat will be disturbed by the proposed project (approximately 0.002%) (USDA 2004). This species is unlikely to be affected by the proposed project because of the lack of individuals, limited available habitat, and that large scale changes in successional stages of forested habitat will not occur.

Greater sage-grouse or their habitat will not be impacted by this project. Extensive sagebrush habitats do not occur within the proposed project area and project activities will occur in forested and riparian habitat. The Columbia spotted frog or their habitat will not be impacted by this project. This species is an ecological indicator of riparian habitats that consist of willow, aspen and sedge community types; none of these community types persist in the proposed project area.

Cumulative Effects
Because large scale changes in habitat will not occur, the status of wildlife species and the habitats that support them will not be significantly influenced by the implementation of this alternative. No future impacts associated with the implementation of this project are anticipated on winter range, threatened, endangered and sensitive species and management indicator species (MIS).