Chapter 3. Affected Environment and Environmental Consequences

Introduction

This Chapter summarizes the physical, biological, social, and economic environments of the project area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2.

The effects analysis of each section includes some parcels that are likely to be dropped from the action alternatives (refer to Appendix D-3). These parcels likely to be dropped would not influence the conclusions reached on the effects of implementation.

Soils

The objective of this section is to generally describe effects on soil resources of affected lands. The analysis area boundary is limited to the parcels involved in the Proposed Land Exchange.

Laws and Regulations Applying to the Analysis

The FSM Title 2500, Watershed & Air Management, contains many sections that directly or indirectly address soil management. The primary section for soils is 2550. FSM 2520 R-6 Supplement 2500-98-01 states "Soil Quality Standards: The following soil quality standards are thresholds beyond which soil quality is adversely impacted. Leave a minimum of 80% of an activity area in acceptable soil quality condition (FS 1998)." Detrimental soil conditions (DSC) are defined for compaction, puddling, displacement, burned soil, erosion, and mass wasting. Refer to the Soils Specialist Report in the PR for Forest Plans standards and guidelines, Pacfish/Infish and Oregon Department of Forestry (ODF) water buffer guidelines and ODF ground-based harvesting rules.

Affected Environment

Soil inventory information is available at the Malheur, Umatilla, and Wallowa-Whitman NF Supervisor's Offices. Soil maps, soil series descriptions, and soil interpretations were not summarized or developed for this analysis, because (1) soils types were not used as decision criteria for selection of any parcel in the land exchange, and (2) soils information was not used for appraisal decisions.

Soil depths range from a few inches to more than 5 feet. Most soils are in the 20 to 60-inch depth range. Soils less than 20 inches deep occur around rock outcrops and on ridges. Soils deeper than 60 inches occur in floodplains and on concave slopes, especially toeslopes.

Soil profile textures range from loamy sands to clay loams, with rock fragment content ranging from near zero in thick volcanic ash and loess deposits, to more than 65 percent in flood deposits and shallow soils. The less than 2 millimeters of topsoil is commonly a loam or silt loam. Most subsoils (under the volcanic ash) have 35 to more than 65 percent rock fragments.

Soil productivity ranges from low to high, with low being in shallow soil rangelands, and high being in timberlands with deeper volcanic ash soils. More specific soil productivity information is available on soil interpretation records at the Wallowa-Whitman NF Supervisor's Office. A

review of the Natural Resource Conservation Service (NRCS) prime farmland geospacial databases (NRCS 2004) found no prime farmland on parcels included in the land exchange.

Environmental Consequences

Detrimental soil conditions (DSCs) as defined in FS 1998 represent adverse effects of human influences on soil productivity and soil stability. It was determined that an inventory of DSCs was not needed for this analysis, neither was it practical because the procedure was designed to be used for project work. It was assumed that broad-scale surrogates would suffice for this analysis and that DSCs are a minor resource concern in this Proposed Land Exchange. Soil productivity impairment exists under all alternatives due to the presence of infrastructure (buildings, roads, bridges, trails, ditches, dams, corrals, etc) and legacy effects of past activities, such as logging in forestlands and grazing in rangelands. No attempt was made to accurately quantify these effects, either on a parcel-by-parcel basis, or for the exchange as a whole.

Alternative 1: Proposed Exchange

Under this alternative, the FS would acquire 31,741 acres of non-Federal lands and would convey 18,172 acres. There would be a net increase in Federal lands of 13,569 acres, which is 74.7 percent of the conveyed lands.

Indirect effects would ensue due to changes in ownership, management objectives, and management practices. Detrimental soil conditions are anticipated to increase on conveyed forestlands. The Oregon Forest Practice Administrative Rules for ground-based private logging (ODF 2004b) do not limit soil disturbance and detrimental soil conditions on slopes under 60% gradient (40% gradient for granitic soils). On steeper slopes, the rules limit total ground disturbance to 10%. In contrast, slopes over 30% gradient on National Forest lands are logged with low-impact cable systems (WWNF 1990). Observations of ground-based logging effects on private lands (Bliss 2003b) suggest DSCs would be at least 10% and would be near 20% in areas with high density skid trails. Therefore, slopes of forestlands in the 30% to 50% gradient range would more likely be logged with ground-based equipment after conveyance, compared to being logged with cable systems if they were not conveyed. Some conveyed forestland would likely be logged during times when soils are very moist to wet, when they are most susceptible to compaction and puddling. This has been occurring on parcels PU22A and 22B.

Detrimental soil conditions also are anticipated to remain the same or increase on conveyed rangelands, if those lands would not be included in an existing Federal grazing allotment. In this situation, Federal grazing standards, including conditions placed on the FS by the National Oceanic and Atmospheric Administration – Fisheries (NOAA – Fisheries) and the United States Fish and Wildlife Service (USFWS) for protection of endangered fish species would no longer apply. Therefore, soil compaction, puddling, displacement, and erosion would be expected to remain the same or increase on these rangelands, especially along streams.

Forest Plan soil productivity standards would be applied to acquired forestlands and rangelands. As land management activities are planned for these areas, detrimental soil conditions would be inventoried, and opportunities to maintain or improve soil productivity would be explored. Knowledge of current land management practices on some private lands, such as logging and road maintenance practices on parcel PU22A and PU22B and feed lots in or adjacent to riparian areas along the Imnaha River and tributaries, provides evidence that land management practices on at least some private parcels to acquire have caused high levels of DSCs.

The cumulative effects of potential changes in soil productivity for these lands can be represented in a general way by showing the trade-offs in ownership changes for commercial forestlands and for rangelands in allotments. More forestland is proposed to be conveyed, in every slope class, than is being acquired, refer to Table 15. Two conclusions can be drawn from comparison of the data when considering FS and ODF logging requirements. First, there is potential for a net increase in DSCs on 3,538 acres of conveyed land in the 30-50% slope gradient class, plus a portion of conveyed land in the >50% slope gradient class (for 50-60% slope gradient). The maximum change would be from about 2% DSCs from road-related cable logging under Federal management to about 10-20% DSCs from ground-based logging under private ownership. The FS normally uses cable systems to harvest trees on slopes over 30% slope gradient, in contrast with private landowners who typically use ground-based logging systems on slopes up to about 50% gradient. Second, there is potential for a net increase in DSCs in riparian management areas on 13,024 acres of conveyed lands due to use of narrower riparian management area buffers on private lands compared with Federal lands. For instance, FS no-disturbance buffers for fish-bearing perennial streams are 200-250 feet wider than ODF buffers for fish-bearing streams, and FS buffers for non-fish-bearing streams are about 50-150 wider than for ODF buffers.

Table 15. Alternative 1- Acreage and Percent of Acquired and Conveyed Commercial Forestland as a Surrogate for Detrimental Soil Conditions

	< 30% slopes	30 - 50% slopes	> 50% slopes	Total Acres[2]
Acres of Acquired Commercial Forestland	3,961	1,071	569	5,601
Acres of Conveyed Commercial Forestland	7,563	3,538	1,923	13,024
Difference (acres)	(-) 3,602	(-) 2,467	(-) 1,354	(-) 7,423
Difference (percent)[1]	(-) 47.6	(-) 69.7	(-) 70.4	(-) 60.0

1) (Difference in acres/Conveyed acres)
2) There may be slight differences in acreages between other totals due to GIS analysis.

The FS would acquire 24,143 acres within allotments, while conveying 15,450 acres from allotments, for a net increase of 8,693 acquired acres (56.3%)(Bulthuis & Whittaker 2004), refer to Table 16. No consistent site-specific information was collected on grazing impacts on acquired and conveyed lands. However, casual observations of grazing impacts on soils in many parcels suggest that grazing-related DSCs (detrimental compaction, displacement, puddling, and erosion) average less than 1%. Such impacts exist on major trails, at stream crossings, in feedlots and corrals, and around salting areas. Casual observations of DSCs on acquired and conveyed lands suggest there is little net difference in soil impacts. The major difference in DSCs between acquired and conveyed lands is the existence of feeding sites and corrals on conveyed lands as shown in Table 17. There are about 0.04 to 5.0 acres of DSCs per site, for a total of about 15 acres. This would be about 0.06% of the proposed acquired acres. Some of these sites would be included in allotments and some would not.

Table 16. Alternative 1- Acreage and Percent of Acquired and Conveyed Rangelands in Allotments

Current Acres	Acres to Acquire	Acres to Convey	Difference in Acres	Difference[1] Percent
1,164,648	24,143	15,450	(+) 8,693	(+) 56.3%

1) (Difference in acres/Conveyed acres)

Table 17. Alternative 1- Location of Known Feeding Sites and Corrals on Acquired Lands

Parcel	Legal Description	Type of Facility	Near What Stream	Allotment
PW10A	T3N, R48E, Sec 13, NW NE	Feeding site	Imnaha River	Dobson Haas
PW10B	T3N, R48E, Sec 13, SE NW	Feeding site	Imnaha River	Dobson Haas
PW13B	T3N, R48E, Sec 23, NE NE	Feeding site	Imnaha River	Dobson Haas
PW20B	T2N, R48E, Sec 3, SW SW	Feeding site	Packsaddle Creek	Log Creek
PW20C	T2N, R48E, Sec 9, E1/2 NE	Feeding site	Imnaha River Tributary	Log Creek
PW24A	T1N, R48E, Sec 20, SE SW/SW SE	Feeding site	Big Sheep Creek	Middle Point
PW24C	T1N, R48E, Sec 30, NE SE	Feeding site	Big Sheep Creek	Middlepoint
PW24D	T1N, R48E, Sec 31 E1/2 NE	Feeding site	Big Sheep Creek	Middlepoint
PW24H	T1N, R48E, Sec 20, NW SW	Barn/Corral	Camp Creek	Middlepoint
PW25D	T1N, R48E, Sec 21, W1/2 NW	Feeding site	Big Sheep Creek	None in allotment
PW34C	T3N, R45E, Sec 22, NE NE	Feeding site	Joseph Creek	Al Cunningham
PW27C	T1S, R48E, Sec 3, NW	Feeding site	Imnaha River	Middle Point
PW39B	T4N, R43E, Sec 23, NE SW	Corral	Buck Creek Tributary	Buck Creek
PW39C	T4N, R43E, Sec 24, SE SW	Corral	Buck Creek Tributary	Buck Creek
PW48	T3N, R49E, Sec 28, SE NE	Litch Ranch Corral	Cow Creek	Dobson Haas

Probable unavoidable effects on soils, following the exchange of lands, would be a small net decrease in soil productivity due to a net increase in soil compaction, puddling, displacement, and erosion. It is highly probable that land management practices that emphasize short-term economic gains (i.e. increased logging and grazing) would cause long-term decreases in soil productivity. Existing permanent infrastructure (buildings, roads, ditches and reservoirs, etc.) on parcels

proposed for acquisition represents an irretrievable commitment of soil resources to those uses. Upon acquisition, some of these infrastructures could be removed or decommissioned, resulting in the retrieval of the soil resource for soil productivity purposes.

There is a high probability that Federal lands exchanged to private ownership would be managed in a manner inconsistent with current Forest Plan standards and guidelines for soil productivity, in particular, the standard requiring DSCs to be kept under 20%.

The status of DSCs on private lands acquired would not be evaluated until a specific project was proposed for that area. If future analysis were to find that DSCs were above the 20% standard, or were otherwise less than desirable, a plan would be made to bring DSCs down to the desired level, where economically and environmentally feasible.

Alternative 2: No Action

Under this alternative, the Proposed Land Exchange would not occur. There is no planned timber harvest activities on lands considered for conveyance under Alternative 1. Livestock grazing and road maintenance would continue, as in the past. Percent DSCs would not change over the 10-year period.

New actions are anticipated to occur on private lands considered for acquisition (non-acquired parcels) under Alternative 1. Additional logging is likely to occur and some recreational residences and access roads could be constructed. These actions would increase total DSCs on non-acquired parcels. DSCs in ground-based logging areas would increase due to additional entries, with total DSCs likely in the 10-20% range. DSCs in skyline logging areas likely would be less than 0.5%, excluding new roads.

Alternative 3: Purchase

It is estimated that the FS could purchase approximately 4,297 acres of non-Federal parcels, which would be 13.5% of the Alternative 1 acreage to acquire. No land would leave Federal jurisdiction.

Indirect effects would ensue due to changes in ownership, management objectives, and management practices. DSCs on purchased lands would be similar to those described under Alternative 1, except the scale of effects would be much less…only about 10-15% of Alternative 1, because Alternative 3 is 13.5% of Alternative 1 acreage. DSCs on Federal lands would be the same as the No Action Alternative.

The FS would not be conveying forestland but would, however, be purchasing a nominal acreage (241 acres) of forestland as shown in Table 18 below. Acreage of and effects on acquired lands are (241 acres under Alternative 3 versus 5,601 acres under Alternative 1) 4.3% of Alternative 1, resulting in a proportionate reduction of inherited soil quality problems. Also, additional logging is likely to occur and some recreational residences and access roads could be constructed on non-acquired parcels. These actions would increase total DSCs on non-acquired parcels as described under the No Action Alternative.

Table 18. Alternative 3- Acreage and Percent of Acquired and Conveyed Commercial Forestland as Surrogate for Detrimental Soil Conditions

	< 30% slopes	30 - 50% slopes	> 50% slopes	Total Ac
Acres of Purchased Commercial Forestland	100	56	85	241
Acres of Conveyed Commercial Forestland	0 ac	0 ac	0 ac	0 ac
Difference (acres)	(+) 100	(+) 56	(+) 85	(+) 241
Difference (percent)[1]	NA	NA	NA	NA

1) Percent is meaningless because all numbers are infinity; NA = not applicable.

Table 19, below, shows the FS would acquire 12,019 acres within allotments, while conveying none (Bulthuis & Whittaker 2004). Effects would be as described under Alternative 1, except they would be proportionately less. Table 20 shows acquired lands with feeding sites and corrals. Total acreage of DSCs for these sites is about 7.5 acres, or 50% of the effect discussed under Alternative 1.

Table 19. Alternative 3- Acreage and Percent of Purchased Rangelands in Allotments

Current Acres	To Purchase Acres	Difference in Acres	Difference[1] Percent
1,164,648	12,019	(+) 12,019	(+) 100%+

1) (Difference in acres/Conveyed acres)

Table 20. Alternative 3- Location of Known Feeding Sites and Corrals on Purchased Lands

Parcel Number	Legal Description	Type of Facility	Near What Stream?	Allotment
PW10A	T3N, R48E, Sec 13, NW NE	Feeding site	Imnaha River	Dobson Haas
PW10B	T3N, R48E, Sec 13, SE NW	Feeding site	Imnaha River	Dobson Haas
PW13B	T3N, R48E, Sec 23, NE NE	Feeding site	Imnaha River	Dobson Haas
PW20C	T2N, R48E, Sec 9, E1/2 NE	Feeding site	Imnaha River Tributary	Log Creek
PW25D	T1N, R48E, Sec 21, W1/2 NW	Feeding site	Big Sheep Creek	Not in allotment
PW27C	T1S, R48E, Sec 3, NW	Feeding site	Imnaha River	Middle Point
PW39C	T4N, R43E, Sec 24, SE SW	Corral	Buck Creek Tributary	Buck Creek
PW48	T3N, R49E, Sec 28, SE NE	Litch Ranch Corral	Cow Creek	Dobson Haas

Alternative 4: Deed Restriction

The FS would acquire approximately 17,119 acres and would convey approximately 18,172 acres. There would be a net decrease in Federal lands of 1,053 acres or (-) minus 5.8 percent of conveyed lands.

The indirect effects would ensue due to changes in ownership, management objectives (including deed restrictions), and management practices. Effects on acquired lands would be as discussed under Alternative 1, except the effect would be about 54% of Alternative 1 levels based on prorated acres. DSCs on conveyed lands (the same acreage as Alternative 1) would be less than those described under Alternative 1 because the 8 deed restrictions would require logging, grazing and road construction to be done according to Federal standards to protect endangered fish habitat and to maintain water quality. Most of the potential increase in DSCs on conveyed forestlands, as described under Alternative 1, would also occur under Alternative 4. The difference is there would be few or no effects within 300 feet of fish-bearing streams. Effects on conveyed rangelands outside of range allotments would also be reduced due to the restrictions.

Restrictions 1a, 2, 4, 5, 6 and 8 would prevent logging, roading, and certain grazing-related DSCs from occurring within 300 feet of Category 1 streams, i.e. fish-bearing perennial and intermittent streams. Restriction 1b would prohibit logging within 150 feet of Category 2 streams, i.e. non-fish-bearing perennial streams. Restriction 1c would prohibit logging within 100 feet of Category 4 streams, i.e. non-fish-bearing intermittent streams. Restriction 3 would limit DSCs by limiting the grazing season. Restriction 7 would limit DSCs by reducing the potential for fill and streambank erosion during floods.

Table 21, shows that more forestland is being conveyed, in every slope class, than is being acquired; the acreage and effects for these conveyed lands are exactly the same as for Alternative 1. However, acreage of and effects on acquired lands are (2,922 acres under Alternative 4 versus 5,601 acres under Alternative 1) 52% of Alternative 1, resulting in a proportionate reduction in soil quality problems acquired in this alternative. Also, some additional increase in DSCs may occur on non-acquired parcels due to private management actions as described in the No Action Alternative.

Table 21. Alternative 4- Acreage and Percent of Acquired and Conveyed Commercial Forestland as Surrogate for Detrimental Soil Conditions

	< 30% slopes	30 - 50% slopes	> 50% slopes	Total Ac
Acres of Acquired Commercial Forestland	2,039	438	445	2,922
Acres of Conveyed Commercial Forestland	7,563	3,538	1,923	13,024
Difference (acres)	(-) 5,524	(-) 3,100	(-) 1,478	(-) 10,102
Difference (percent)[1]	(-) 73.0	(-) 87.6	(-) 76.9	(-) 77.6

1) (Difference in acres/Conveyed acres)

Table 22 below, shows the FS would acquire 12,201 acres within allotments, while conveying 15,450 acres from allotments, for a net decrease of 3,249 acres (21%) of conveyed lands (Bulthuis & Whittaker 2004). When considering feeding sites and corrals, the only difference between Alternative 1 and Alternative 4 is this alternative does not include the corral in PW39B.

Table 22. Alternative 4- Acreage and Percent of Acquired and Conveyed Rangelands in Allotments

Current Acres	Private Acres to Acquire	FS Acres to Convey	Difference in Acres	Difference[1] Percent
1,164,648	12,201	15,450	(-) 3,249	(-) 21.0 %

1) (Difference in acres/Conveyed acres)

Minerals

The purpose of this section is to assess the potential for occurrence of and the potential for development of valuable minerals within the proposed Blue Mountain Land Exchange parcels. All Federal and non-Federal parcels proposed for exchange were evaluated in the Minerals Specialist Report dated 2/20/2004. This report is located in the PR.

Non-Federal and Federal lands were analyzed for their land status and mineral potential, and also reviewed for the presence of potentially hazardous mining-related substances and public safety issues. Geologic and mining history research was conducted in preparation for field reconnaissance. Known or estimated mineral occurrences were noted, and the locations of historic and current mining operations were noted from several mining history publications. The Bureau of Land Management (BLM) mining claims database was also consulted for industry interests by noting the presence of past or current mining claims in the immediate area of the parcels. Parcels were selected for field reconnaissance based on their proximity to these known surface mineral occurrences, mining activities, mining claims, geology, and land status (i.e.: patented mining claims).

Aerial photos were also used for several of the properties before field visits to determine the possible presence of mining activities on parcels that did not have potential for such based on their geologic location. For example, most of the non-Federal and Federal properties are located on basalt and andesite flows of the Columbia River and Strawberry Mountain events. There is no historic or current evidence of mineral activity or interest in these areas, other than the subsurface resources of oil and gas and geothermal. It was not necessary to visit parcels with potential only for oil and gas or geothermal resources, as these are subsurface resources that have no surface indicators.

Specific parcels visited during field review are listed in the Minerals Report located in the PR. Discussions of findings that would influence this analysis can be found under specific mineral commodity types discussed below. All of the mineral evaluations for the proposed exchange parcels were begun with historical and current research by State and Federal agencies such as the Oregon Department of Geology and Mineral Industries, BLM, US Geological Survey, and the Department of Energy. The discussion on classification of potential for each parcel is in compliance with BLM Manual 3031 – Energy and Mineral Resource Assessment (USDI, 1985).

Affected Environment

The project area is included within the Blue Mountain Region island-arc (Vallier, 1995), which is composed of Late Jurassic to Early Cretaceous plutonic and sedimentary rocks. Most of the area is now covered by 16 millions year old flood basalts that originated in the area of eastern Oregon and Washington, and southwestern Idaho. These basalt flows have interbeds of tuffaceous siltstones, sandstones and clays (Ferns, 1985). Subsequent erosion of these basalts provides "windows" to the underlying older rocks. A local geology discussion and brief description of the underlying older rocks can be found in the PR.

Mineral Deposits - Locatable Minerals

The Blue Mountain Province contains historic deposits of placer and lode mineralization that have been exploited since the 1860s. The "gold belt of the Blue Mountains" (Lindgren, 1901) is about 50 miles wide and 100 miles long, extending from Hells Canyon on the east to John Day on the west. Almost all of the placer and lode mining occurred in this part of the project area. Additional occurrences of copper, zinc and molybdenum occur in the Hells Canyon area along the Snake River.

Mineral Deposits - Placer

Placer gold was first discovered in northeast Oregon in the mid 1800s (Brooks and Ramp, 1968), and was actively pursued in a number of gold rushes, predominantly in the 1860s to 1880s, then again with the bucketline dredges from the early 1910s up to 1954. From then to the present, the majority of placer operations have been small companies and individuals conducting sporadic exploration with limited production.

Very few of the included non-Federal and Federal parcels appear to contain placer deposits that are historically known for gold exploration or production. The non-Federal parcel PM 5 on Deep Creek is a patented placer claim. Historical research for the Deep Creek property did not reveal specific records of activities or production from this site, just a brief reference that placer mining had occurred on Deep Creek in the Susanville area. Field reconnaissance on September 9, 2002 revealed that the banks of Deep Creek within the boundaries of this claim had been hydraulically mined, and the river gravels had been worked.

The non-Federal parcels PW35A, B and C adjacent to Hurricane Creek are three patented placer claims, the Butte, the Blue Bird, and the Cougar, totaling 471 acres. Literature research did not reveal recorded history of operations or production from this property, nor what these claims were patented for. There are also no indications that placer mining occurred on these claims. The claims are located on the lower mid-slope east of Hurricane Creek, and contain 5 or 6 steep intermittent stream channels. Upslope from these claims is an extensive exposure of contact between Jurassic limestones and younger granitic intrusions. The Legore Mine copper, gold, silver and molybdenite property is located on this contact approximately one mile upslope of these placer claims, and is likely the source of minerals sought for in patenting these placer claims. It is likely that residual minerals could be located in gravels in these intermittent stream channels, but apparently these minerals were of insufficient quality and quality to warrant any development or production. A detailed sampling and economic analysis for this property has not been done.

The private land adjacent to the Bridge Creek Wildlife Area (PU16F and G) shows evidence of small scale historic hydraulic or ground sluicing on the north banks of the John Day River. There is no evidence of recent placer work in this area, nor are there any unworked highbar gravels on these parcels.

There are no other patented placer claims involved in this exchange, and no other historic or projected placer deposits evident on the non-Federal parcels.

Federal parcels currently have no placer mining claims located on or near them. Those Federal parcels in the "gold belt of the Blue Mountains" visited and/or researched revealed no potential for economic placer deposits.

In summary, all of the parcels included in the proposed exchange are classified as having low potential for placer deposit occurrence and development.

Mineral Deposits - Lode

Lode deposits were discovered shortly after the placer mining began. Lode gold deposits were predominantly in the same general locations as the placer deposits, as described above. There were also mercury deposits in the vicinity of the State parcels PM 21, and PM25-31, however, field review and literature search of this area revealed no known mercury occurrences on or adjacent to these parcels.

Extensive historic hard-rock exploration with limited production occurred in Hells Canyon along the Snake River from Copperfield just east of Halfway to the Oregon/Washington border. Some exploration and underground development with very limited production occurred nearer the subject lands in the Imnaha River drainage near its confluence with the Snake River. The Mountain Chief mine at the confluence of the Imnaha with the Snake River did produce a limited amount of copper resources. This material was stockpiled adjacent to the Imnaha River in the early 1900s, however, the proposed mill was never completed, and this stockpile still remains. Non-Federal parcels PW1, PW2A, B and C, and PW6 are patented lode mining claims located along the Imnaha River four miles upstream from the Snake. All of these claims were patented in the early nineteen hundreds; however, none of them ever developed more than a few hundred feet of underground exploratory drifting, and none went into production. Currently, the adits are somewhat accessible by foot, but they are mostly overgrown from 80 or 90 years of neglect. Parcel PW8A has a shallow shaft and several exploratory pits. There is no indication or literature available that would indicate the age of these workings.

In the Lostine drainage, non-Federal parcel PW37 is a portion of a patented lode mining claim named "Big Joe". This portion lies west of the Lostine River, and is in the Lostine River floodplain. Field and literature review showed no evidence of lode mining activity.

Non-Federal parcels PW47A and B are the Frasier patented lode group containing three lode claims named Golden Gate, Golden Gate No. 1 East, and Sunset, all patented in 1916. They are situated at Hawkins pass, at an elevation of 8,400 feet in the center of the Eagle Cap Wilderness. The claims exhibit copper, gold, tungsten and molybdenum bearing minerals. The property was developed in 1914 by surface cuts and underground exploratory drifts. Field and literature review indicate that little has occurred at this mine since it was patented.

Parcels PW1, PW2A, B and C, and PW6 in Hells Canyon, parcel PW37 in the Lostine drainage, parcels PW35A, B, and C in Hurricane Creek, and parcels PW47A and B at Hawkins Pass are the only non-Federal parcels that were patented from Federal jurisdiction due to expected values of locatable minerals. The parcels in Hells Canyon and Hawkins Pass show evidence of some development, but no production. The other parcels show no evidence of mineral development. With the exception of the Hawkins Pass property, these parcels do not contain measurable quantities of valuable locatable minerals. Therefore, these parcels would have a moderate potential for occurrence. No attempt was made to estimate actual acres, tons, or cubic yards of potential lode mineralization. An economic analysis located in the PR, revealed that the occurrence potential for the Hawkins Pass property is high, however, the development potential for this property is low. All of the remaining non-Federal parcels are rated as having low to no potential for occurrence and development of locatable minerals.

The mineral estates of the Hawkins Pass property would have public domain status upon consummation of this exchange, but would be withdrawn from mineral entry, as they are located in currently withdrawn areas.

Based on the lack of current or historic locatable mineral development, the apparent lack of industry interest, and the mapped and inferred geology of each of the Federal parcels, the potential for economic locatable mineral occurrence and development is low to none.

Mineral Deposits - Saleable Materials

The majority of non-Federal and Federal parcels are located on volcanic flows of basalt, andesite and rhyolites of the Columbia River basalt group and the Strawberry Mountain flows. These rocks are suitable for crushing for road construction and other similar purposes. Numerous pits throughout the project area provide the supplies demanded by the public and Federal and State agencies, however, none of these active pits are located on the proposed exchange lands. These lands do not appear to contain these resources in values or quantities above that of the surrounding lands.

Considering the high variety of rock types outcropping in the project area as observed during field reviews, all of the parcels would be classified as high potential for occurrence.

Based on the lack of current development on the subject lands but the presence of old pits not currently in use, the potential for development of these resources is moderate.

Mineral Deposits - Leasable Minerals

Oil and Gas

More than half of the subject lands are underlain by the Columbia Basin and Central Oregon Mesozoic Basins (Olmstead, 1989), containing a major deposit of mostly marine sedimentary rocks. The Columbia Basin is structural, with a thickness up to 20,000 feet of arc-derived marginal and non-marine Cretaceous to late Tertiary sediments. They are covered with thick Miocene Columbia River Basalt flows which are an impediment to oil and gas exploration.

Some of the sediments known to exist beneath these basalts are marine organic shales and mudstones that may be mature, oil-prone source rocks (Tennyson, et. al., 1987). Miocene and younger structural folds in the area could also provide for oil and gas traps and seals. Although the geology of this area indicates the potential for oil and gas occurrences, very little exploratory

drilling has been done. The majority of oil and gas occurrences are actually incidental to other activities (Olmstead, 1989), and all occurrences have been insignificant.

Due to the lithology and geologic structure of the area included in the Columbia Basin and the Central Oregon Mesozoic Basins, and the literature sited, the area within these basins is classified as having moderate potential for oil and gas occurrence. There are approximately 19,446 acres of non-Federal mineral lands that are classified as having moderate potential for oil and gas occurrence. The remaining 12,300 acres of non-Federal mineral lands are classified as having low potential for oil and gas occurrence.

There are approximately 15,170 acres of Federal mineral lands that are classified as having moderate potential for oil and gas occurrence. The remaining 2,604 acres of Federal mineral lands are classified as having low potential for oil and gas occurrence.

There are no known private oil and gas leases on the subject Federal or non-Federal lands. Because no substantial exploration occurred during high oil prices, and in the time since the last price spike, it is unlikely that any would occur in the foreseeable future. Therefore, the potential for oil and gas development on either the non-Federal lands or the Federal lands are low to none.

Coal/Lignite

Coal and lignite deposits in the area of the subject lands are contained in the sedimentary interbeds between the individual Columbia River Basalt flows (Ferns, 1985); however, none of the subject non-Federal or Federal lands has identified actual lignite outcrops. Refer to the Mineral Report in the PR for a detailed discussion on coal/lignite occurrences near the proposed exchange parcels.

There are 2,162 acres of non-Federal lands in Wallowa County where geologic mapping projects the Grouse Creek formation beneath the area containing these parcels. There are also 1,787 acres of Federal lands in this same area with the same formation projected beneath them. These non-Federal and FS acres would therefore be classified as having moderate potential for lignite occurrence based on their proximity to known lignite deposits and inferred geology that supports this type of deposit. The likelihood of economic development of any potential lignite resources on these subject lands is low.

There are 189 acres of Federal lands in Morrow County that are in close proximity and similar geology as the Willow Creek Coal Field. These Federal lands would therefore be classified as having moderate potential for lignite occurrence. The likelihood of economic development of any potential lignite resources on these Federal lands is low.

The remaining non-Federal and Federal lands are classified as having low to no potential for lignite occurrence, and therefore low to no potential for lignite development.

Geothermal

Geothermal resources in Oregon are mostly associated with the volcanic regions of the Cascades and the highly fractured and faulted area of southeast Oregon. The project area has a higher than normal geothermal gradient, between 60 and 90 degrees C, which is attributed to a thin crust overlying a hot mantel, and lower than average thermal conductivity of the overlying rocks (Bowen, 1977). As a result, numerous warm and hot springs are present throughout the project area, indicating the potential presence of widespread, shallow geothermal resources. Geothermal resources are considered “blind” (Bloomquist, et. al., 1985) in that they are not limited to areas of

surface manifestations such as hot springs and fumaroles. Consequently, estimating potential occurrences and qualities of this resource is uncertain.

None of the parcels included in this proposed exchange have known geothermal resources. Refer to the Minerals Report in the PR for a discussion on geothermal resource assessments by R. G. Bloomquist and Gerald L. Black.

Based on the proximity of known geothermal resources to the parcels included in this exchange, and on previous reports as cited in the Minerals Report, with the exception of the 58 acres of private land at Hawkins Pass (PW47A and B – low potential) all of the non-Federal and Federal parcels included in this proposed exchange would be classified as having a moderate potential for occurrence of geothermal resources. There are approximately 6,243 non-Federal acres of high potential for exploration and development of geothermal resources. The remaining non-Federal acres would be classified as having a moderate potential for exploration and development, with the exception of the 58 acres at Hawkins Pass (PW47A & B), that would be classified as low due to its remoteness, and low classification for occurrence.

Based on the same information referred to above, there are approximately 2,386 FS acres of high potential for exploration and development of geothermal resources. The remaining FS acres would be classified as having a moderate potential for exploration and development.

Hazardous Mining Related Materials/Underground Workings

There are no mining-related hazardous materials located on these properties. None of the properties had any level of mineral production that would have generated potentially hazardous mill tailings, and all mine properties were investigated for the presence of chemical storage.

Some of the non-Federal properties in Hells Canyon do contain underground workings that are currently open and accessible. These pose a potential threat to members of the public who might enter them. Hazards associated with these small mines include insufficient oxygen, falling rocks, hidden shafts (falling hazard), and wildlife. These workings may also contain sensitive bat populations common in the Hells Canyon area. Upon consummation of this exchange, two open portals should be gated. They are on the Pine Tree (PW6) and the Evening Star (PW2B). The estimated cost to install bat-friendly gates is estimated to be $2,500 per portal. The appropriate level of NEPA will be completed prior to implementation. The Wild Irishman, MS 807 (PW1), also has two open portals but they are very inaccessible. These two portals do not represent a significant public safety hazard; therefore no gates are recommended for these portals.

Environmental Consequences

Alternative 1 Federal and non-Federal land status as of the date of the Minerals Specialist Report is disclosed below. Alternative 1 has 169 non-Federal parcels belonging to a consortium of private and Oregon State landowners in exchange for 94 Federal parcels. The measurement indicator of acres available for mineral entry will be used to assist in comparing each alternative.

Alternative 1: Proposed Exchange

According to the title search conducted for this exchange, there are approximately 4,632 acres of non-Federal lands that would classify as having outstanding mineral rights where all of the minerals do not necessarily belong to the current surface owners. The parcels with outstanding mineral reservations include PM 4 (outstanding 40 acres), PU 24 (outstanding 161 acres), PM18,

PM20 (outstanding 960 acres), PM14, PM15, PM19 (outstanding 320.51 acres), PM5 (outstanding 50.23 acres), PM 28 (outstanding 161 acres), PM29 (outstanding 44 acres), PM30 (outstanding 641 acres), PM25 (outstanding 161 acres, PM 26 (outstanding 160 acres), PM27 (outstanding 159 acres), PM21 (outstanding 146 acres), PM31 (outstanding 160 acres), PW51D, PW3, PW4, PW48, PW5 (outstanding 916 acres), PW51C (outstanding 40 acres), PW35A, PW35B, PW35C (outstanding 470.35 acres) and PW37 (outstanding 4 acres). The majority of these mineral acres are clearly in outstanding status, retaining all minerals to a previous owner. However, there are 2,548 acres of the 4,632 acres where 50% undivided interest was reserved to a former owner, including 1,632 acres where the State of Oregon owns an undivided 50% of the mineral estate. Upon completion of this proposed exchange, the United States would own a 50% undivided interest in these 2,548 acres of minerals, and these minerals would have public domain status. In the total acres of outstanding minerals are 4 acres of outstanding mineral rights associated with the patented lode mining claims included with Mineral Survey 774 (parcel PW37). This mineral reservation is for 49% of all minerals for a period of 30 years, beginning in 1968. That time period could be extended beyond the 30 years if the minerals were brought into production, and production continued beyond 1999 when the reservation would normally have terminated. These lands were sold in 1987, and this reservation was discussed in that deed as well. To date, there has been no production of minerals on these lands; therefore, it is assumed that these minerals are no longer in outstanding status. There are also four patented placer claims included in this exchange that have the standard lode mineral reservation (PW35A, B and C, and PM5), all lode deposits known to exist at the time of patenting are not included in the patent. However, according to BLM records, there are no lode mining claims on these patented placer properties, and no indication of known lode deposits within the boundaries of these claims, therefore, there were no known lode deposits on them at the time of patenting. If acquired, these minerals would become public domain open to mineral entry, if a legitimate mining claim on a known lode deposit did exist, this proposed exchange would have no effect on that lode claim.

Federal parcel FM9 (321 acres) has outstanding minerals from a former land exchange. As of May 22, 2003, there are no mining claims on any of the Federal parcels. All Federal lands subject to mineral entry were segregated on April 1, 2002. These lands would remain closed to mineral entry until a decision on the proposed land exchange occurs.

Case law has established that the mineral estate is dominant over the surface estate, that is, the owner of the private minerals has the right to use as much of the surface as is reasonably necessary to access and develop the mineral estate. Reasonable access to private minerals must be allowed. The following discussion refers to a few parcels of land currently owned by the Oregon Department of Fish and Wildlife (ODFW) in the Murderer's Creek area on the Malheur NF. These parcels proposed in the exchange: PM21, PM25, PM26, PM27, PM28, PM29, PM30, and PM31, are hereafter referred to as the Murderer's Creek parcels. Acquisition of the Murderer's Creek parcels would only include half of the mineral estate. Numerous attempts have been made in the past few years to bring the two half interests in the mineral estate together, with no success. An assessment as to the potential risk associated with the Murderer's Creek parcels acquisition was completed. It included measures in place to protect the interests of the United States if these parcels are acquired with half outstanding mineral rights. The assessment was based on information from the Area Mining Specialist; direction in FSM 2832, past attempts at exploration and development, and attempts to secure the outstanding mineral estate from the current owner. This assessment is summarized in the following discussion.

Access and surface operations are subject to Federal and State laws, but not subject to 36 CFR 228 regulations. Typically, the deed will state that the mineral estate owner has the right of ingress and egress. The deed to the parcels in question states that the grantor has "...reasonable rights of way for ingress and egress; provided that in the use of the surface, the said grantor, its successors and assigns, shall not unreasonably interfere with the use thereof for agricultural or ranching purposes by the grantee…" Usually, the rights under deeds can generally be defined by reference to State law. Access to all parcels except PM28 and PM29 is available; however, access to PM28 and PM29 would be quite difficult, as these parcels lie on very steep ground. The parcels are located in an area of moderate potential for occurrence of oil, gas, and geothermal resources. The potential for development for oil and gas resources is low, and moderate to high potential for geothermal development. Currently, the economics of development are poor. In the mid-70's, much of the South Fork John Day River basin was surveyed and seismic testing was completed, but not specifically in the area where the Murderer's Creek parcels are located. A number of leases were acquired although no development ever took place. Subsequently, all leases expired with no activity. Procedures, should the mineral owner exercise his outstanding mineral rights, are outlined in Forest Service Manual 2832. The mineral owner submits a proposed operating plan to the Forest Supervisor. This operating plan is reviewed for consistency with the rights granted in the deed and for consistency with the Forest Plan. It is also evaluated to determine if it proposes to use the minimal surface area as is prudently necessary for the proposed operations. If the operating plan does not meet these criteria, the Forest Supervisor shall meet with the owner to negotiate modifications needed to make the plan acceptable, or at least attempt to do so. The State of Oregon also plays a part in this process, as there are State controls on mineral development under these circumstances. The Department of Geology and Mineral Industries (DOGAMI) acts as a referee in negotiating with the mineral estate owner regarding his Plan of Operations. When both the owner of the mineral estate and the surface owner agree to this Plan, and it complies with other State requirements, both parties must sign the Plan. The Plan is submitted to DOGAMI and a State permit is issued. The State will also secure a bond to cover the operation; however, that bond is usually of a limited amount - $3000 for the first acre disturbed, $2000 per acre after that.

The Blue Mountain Land Exchange facilitator has control over an undivided 50% mineral interest in the Murderer's Creek parcels, and has agreed to donate these minerals to the United States. These minerals would then take on Week's Act status, excluding them from mineral operations under the 1872 Mining Law, but allowing mineral development under the Mineral Leasing Laws and regulations, under which the agency has substantially more control. Subsequently, there would be less potential complication in managing the surface should the owner of the other 50% mineral estate, which would remain as outstanding, propose development of those minerals.

By not proceeding with the acquisition of the Murderer's Creek parcels, these parcels would remain in ODFW ownership. Management options would remain as they are, however, ODFW's ability to pursue options desirable to them would be limited. Management costs common to private lands within the National Forest, i.e., access complications, boundary issues, etc., would remain if the Murderer's Creek parcels would not be acquired. There would also be a potential for these costs to increase if the State were to sell these parcels to private interests. It is likely that acquisition of the Murderer's Creek parcels would assist the ODFW in furthering their mission while not adding an extraordinary burden to the United States. Should the outstanding mineral rights owner propose development, it is reasonable to conclude that adequate protection would be in place to ensure wise use of these parcels if the facilitator donates the other half interest in the

mineral estate to the United States (Letter to Regional Forester/Split Mineral Estate/Murderer's Creek Parcels in PR).

On an acre-per-acre basis, the Federal government would realize a net increase in mineral estate acres and total mineral value under Alternative 1. The vast majority of the private parcels to acquire are currently owned fee simple. That is, the current owners own both the surface and mineral estates. Many private parcels to acquire are inholdings within areas already withdrawn from mineral entry. These withdrawn areas include the HCNRA, the Hells Canyon Wilderness, the Imnaha and Snake Wild and Scenic River corridors within the HCNRA, the Lostine River Roadside and Riverfront Zone, the Lostine Wild and Scenic River (the Recreation portion of this river was also withdrawn), and the Eagle Cap Wilderness. A total of 8,261 acres of non-Federal parcels are located in these areas (Refer to Table 23). The largest number of non-Federal parcels that would fall into this category is in the HCNRA. The HCNRA Act of December 31, 1975 (Public Law 94-199) includes the recreation area, the wilderness area, and the wild and scenic river corridors within the HCNRA. The Act specifically states:

> Sec. 9 (g):
>
> "… Upon acquisition of any such interest, the lands and/or minerals covered by such interest are by this Act withdrawn from entry or appropriation under the United States mining laws and from disposition under all laws pertaining to mineral leasing and all amendments thereto."

There are also some Federal parcels within this area that are currently withdrawn.

> Sec. 11:
>
> "Notwithstanding the provisions of section 4(d) (2) of the Wilderness Act and subject to valid existing rights, all Federal lands located in the recreation area are hereby withdrawn from all forms of location, entry, and patent under the mining laws of the United States, and from disposition under all laws pertaining to mineral leasing and all amendments thereto."

The Eagle Cap Wilderness Act of June 26, 1984, and PLO 1867 (October 28, 1988) withdrawing the Lostine River Roadside and Riverfront Zone and the Lostine Wild and Scenic River corridor, contains similar language withdrawing from all forms of appropriation. Table 23 identifies the non-Federal parcels located within these areas. Following implementation of Alternative 1, these acquired parcels would be withdrawn from mineral entry according to the provisions of the individual Act or Public Land Order under which these areas were withdrawn. Approximately 23,480 acres would be available for mineral entry.

Table 23. Non-Federal Parcels Within Withdrawn Areas

Wilderness Area	Parcel	Alt 1	Alt 2	Alt 3	Alt 4
Eagle Cap Wilderness	PW47A,B	58	0	58	58
Hells Canyon Wilderness	PW29	143	0	143	143
Lostine River	PW37	4	0	4	4
HCNRA	PW1	11	0	11	11
	PW2 A-C	61	0		
	PW3	564	0		
	PW4	40	0		
	PW5	40	0		
	PW6	9	0		
	PW7 A-C	445	0		
	PW8 A-C	726	0		
	PW10 A,B	164	0	164	164
	PW11	41	0	41	41
	PW12	257	0		257
	PW13 A-D	197	0	197	197
	PW14	649	0		649
	PW15 A,B	274	0		274
	PW16 A-E	698	0	503	698
	PW17 A,B	517	0		517
	PW18	41	0		41
	PW19 A-C	384	0	363	384
	PW20 A-C	534	0	310	534
	PW21 A-D	383	0	383	383
	PW22	41	0	41	41
	PW23 A,B	114	0	114	114
	PW48	233	0	233	233
	PW25 A-E	680	0	606	680
	PW26 A-C	627	0		627
	PW27 A, C	207	0	127	207
	PW28	119	0	119	119
Total Acres		**8,261**	**0**	**3,417**	**6,376**

There are several Federal parcels currently located within withdrawn areas. The HCNRA contains parcels FW1D, FW1E, FW5, FW7 and FW8. The Lostine Wild and Scenic River Withdrawals contain FW17A and FW17C. The withdrawal would be revoked for all of these lands by the Department of Interior prior to conveyance.

Alternative 2: No Action

In the No Action Alternative, private parcels that are proposed for acquisition would not be acquired and Federal parcels that are proposed for conveyance would continue to be part of the

National Forest System. The Federal government would retain its existing mineral estate. Any non-exchanged Federal parcels outside of withdrawn areas would be released from segregation and therefore open for mineral entry. Federal parcel FM9 (321 acres) would continue to have outstanding minerals from a former land exchange.

Alternative 3: Purchase

The number of acres drops substantially from the Proposed Exchange Alternative as no lands would be conveyed and prioritized parcels would be purchased up to a given funding level. The mineral resource was not a factor used in prioritization for purchase.

In Alternative 3, there are approximately 237 acres of non-Federal lands to purchase that would classify as having outstanding mineral rights where all of the minerals do not necessarily belong to the current surface owners. The acquisition of split estates and the problems associated with this type of acquisition is documented in the effects analysis of Alternative 1. On an acre-per-acre basis, the Federal government would realize a net increase in mineral estate acres and total mineral value because of the purchase of the non-Federal parcels. This increase would be significantly less than Alternative 1.

Under Alternative 3, a total of 3,417 currently non-Federal purchased acres are located in mineral withdrawal areas (Refer to Table 23). This table identifies the non-Federal parcels purchased within these areas. Following implementation of Alternative 3, these purchased parcels would be withdrawn from mineral entry according to the provisions of the individual Act or Public Land Order under which these areas were withdrawn. Approximately 1,065 purchased non-Federal lands would be available for development under mineral leasing laws in addition to all the non-exchanged Federal parcels outside of special withdrawn areas. These segregated Federal lands that were not in the special areas previously identified in Table 23 would be released from segregation and therefore also be open for mineral entry.

Alternative 4: Deed Restriction

Parcels conveyed would be the same as in Alternative 1, however deed restrictions would reduce the value of those acres, therefore less acres would be acquired. The Mineral resource was not a factor used in prioritization for acquisition.

In Alternative 4, there are approximately 1,469 acres of non-Federal lands to acquire that would classify as having outstanding mineral rights where all of the minerals do not necessarily belong to the current surface owners. The acquisition of split estates and the problems associated with this type of acquisition have been previously documented. On an acre-per-acre basis, the Federal government would not likely realize a net increase in mineral estate acres and total mineral value because fewer acres would be acquired than conveyed. The increase in mineral estate and total mineral value would be substantially less than Alternative 1 and somewhat less than Alternative 2.

Under Alternative 4, a total of 6,376 non-FS Acres are located in special mineral withdrawn areas (Refer to Table 23). This table identifies the non-Federal parcels acquired within these areas. Following implementation of Alternative 4, these acquired parcels would be withdrawn from mineral entry according to the provisions of the individual Act or Public Land Order under which these areas were withdrawn. Approximately 10,743 acquired acres would be available for mineral entry under this alternative.

There are several Federal parcels currently located within withdrawn areas. The HCNRA contains parcels FW1D, FW1E, FW5, FW7 and FW8. The Lostine Wild and Scenic River Withdrawals contain FW17A and FW17C. The withdrawal would be revoked for all of these lands by the Department of Interior prior to conveyance.

Hydrology, Wetlands, and Floodplains

The objective of this hydrology section is to describe the existing condition of the hydrologic system associated with the Proposed Land Exchange parcels and disclose the hydrologic direct, indirect, and cumulative effects. Wetland condition, floodplain function, water quality, riparian condition, and water yield are described with narratives and accompanying tables. The analysis areas used includes individual exchange parcels, 47 watersheds (5^{th} field hydrologic unit code {HUC}), and sub-watersheds with the highest concentration of exchange parcels. The project area includes portions of 13 sub-basins, across four river basins.

Laws and Regulations Applying to the Analysis

Executive Orders 11988, Floodplain Management and 11990, Protection of Wetlands, direct Federal agencies to preserve, restore, and enhance the natural and beneficial values of floodplains and wetlands in carrying out agency responsibilities for, among other activities, acquiring and conveying of Federal lands.

FSM 2527, Floodplain Management and Wetland Protection directs the agency to protect wetland values and prevent increased flood hazards. FS Handbook (FSH) 5409.13, Land Acquisition Handbook directs the agency to identify and document any loss of wetland values and any anticipated increases in flood hazard.

The FS and the State of Oregon Forest Practices Regulations both base aquatic protection on applying management restrictions or standards within riparian management zones, which are defined according to categories of beneficial use.

National Forests in Region 6, outside of the range of the spotted owl, have adopted PACFISH and INFISH as interim aquatic conservations strategies and have incorporated them into each Forest Plan. These strategies apply to the three Blue Mountain Forests, the Malheur National Forest, the Umatilla National Forest, and the Wallowa-Whitman National Forest, which are parties to this Proposed Land Exchange. Interim aquatic conservation strategies were adopted to protect Endangered Species Act (ESA) listed fish species and to maintain, restore, and preserve management options for the future. Interim Riparian Habitat Conservation Areas (RHCAs) are designated to protect, maintain, and allow the recovery of riparian management objectives (RMOs). Interim criteria for RMOs have been established for pool frequency, water temperature, large woody debris (forested systems), bank stability, lower bank angle (non-forested systems), and width/depth ratio to allow the measurement of attainment or progress toward attainment of riparian goals.

On NFS lands in the exchange, PACFISH/INFISH standards and guides are applied to management activities near channels and wetlands. These standards and guides direct that Watershed Analysis occur before any commercial harvest within RHCAs (Table 24). Any vegetation treatment within RHCAs is to be in support of riparian management objective criteria. Grazing and road management practices are to avoid adverse effects on listed fish species (USDA FS, 1995).

Table 24. PACFISH and INFISH RHCA Widths

PACFISH & INFISH	Category 1 Fish Bearing	Category 2 Perennial non-fish bearing	Ponds, Lakes, Reservoirs, and Wetlands > 1 acre	Intermittent Streams and wetlands < 1 acre and landslide prone areas
RHCA Interim Widths	The greater of: the outer edge of the 100 year floodplain or 300 feet	The greater of: the outer edge of the 100 year floodplain or 150 feet	150 feet	100 feet or 1 mature site potential tree height in Key Watersheds. 50 feet in INFISH, non-key watersheds

On private and state lands, the Oregon Forest Practices Act is used to regulate timber harvest and associated activities near channels. The Oregon Forest Practices Act and the Oregon Administrative Rules (OAR); Water Protection Rules identify protections for riparian areas, wetlands, and water quality. Rules related to management of roads and harvest near channels are summarized in the PR.

The purpose of the water protection rules is to protect, maintain, and (where appropriate) improve the functions and values of streams, lakes, wetlands, and riparian management areas (RMA). These functions and values include water quality, hydrologic functions, the growing and harvesting of trees, and fish and wildlife resources.

Affected Environment

Climate varies across the Blue Mountain Province of Northeast Oregon. The western slopes of the northern Blue Mountains in the Umatilla Basin are influenced by marine weather systems that move east through the Columbia River Gorge. Precipitation exceeds many other areas in the region. The majority of the precipitation occurs in the winter months and early spring as snow at higher elevations. Rain-on-snow events are common in this basin. A mix of spring snowmelt dominated by annual peaks and winter rain-on-snow events generate annual peak hydrographs. The other physiographic provinces in the land exchange have similar climate patterns; continental climate with short, dry summers and long cold winters. The snow pack at higher elevations dominates the hydrograph, which has spring peak flows.

Precipitation declines from north to south, with the 30-year average equal to:

Aneroid Lake (Wallowa Mountains)	49 inches
High Ridge (Umatilla Basin)	50 inches
Tipton (Dixie Summit)	26 inches
Star Ridge (Strawberry Mountains)	21 inches

Large Pacific Northwest regional rain-on-snow events are the source of the floods of record in 1964, 1996, and 1997 and can occur from November though February in the Umatilla River Basin and portions of the Grande Ronde River Basin including portions of the Wallowa, Imnaha, and Grande Ronde rivers.

Most acres proposed in the Blue Mountain Land Exchange are located in the John Day River Basin on the south end of the Blue Mountains and in the Lower Snake River Basin, located in the

north end of the Blue Mountains. Table 25 lists the river basins, affected watersheds, displays ownership, and displays the acres proposed for exchange by affected watershed. Acreages, stream category, and miles of stream by category were calculated with the NFS Geographic Information System (GIS) and are approximate.

Table 25. Watersheds, Ownership, and Proposed Exchange Acres

Watershed Name	Watershed Ownership Acres						Exchange Acres	
	NFS	BLM	Other	Tribal	Private	Total	FS To Con-vey	Private To Acquire
Middle Snake/Powder River Basin							**42**	**454**
Snake River/Indian Creek	69,173	17,941	20,011		10,610	117,736		153
South Fork Burnt River	45,232	2,719	393		26,934	75,278	42	
Upper Eagle Creek	105,044	3,842	281		14,271	123,438		311
Lower Snake Basin							**5,007**	**13,789**
Snake River/Divide Creek	37,297	2,988	22,595		40,535	103,415		4
Upper Imnaha River	90,277		0		111	90,388		36
Middle Imnaha River	74,333		0		13,613	87,946	244	1,274
Big Sheep Creek	71,451		0		17,524	88,975	1,348	261
Little Sheep Creek	28,523	459	265		100,572	129,820	82	458
Lower Imnaha River	119,634	76	78		27,309	147,098	452	6,641
Meadow Creek	84,038	320	124	3,404	28,023	115,909	388	241
Grande Ronde River/Five Points Creek	37,252	435	1,486		48,710	87,882	9	36
Upper Wallowa River	56,332		48		101,359	157,739	409	481
Lostine River	43,685		774		13,614	58,073	13	4
Middle Wallowa River	515		61		84,395	84,971	124	
Bear Creek	36,451		158		9,800	46,409	82	
Lower Wallowa River	8,499	2,610	777		98,154	110,040	70	
Grande Ronde River/Rondowa	50,366	3,263	5,120		55,871	114,619		157

Table 25. Watersheds, Ownership, and Proposed Exchange Acres (continued)

Watershed Name	Watershed Ownership Acres						Exchange Acres	
	NFS	BLM	Other	Tribal	Private	Total	FS To Con-vey	Private To Acquire
Wenaha River	182,747	589	3,241		2,517	189,093		969
Chesnimnus Creek	63,654		6		58,981	122,640		1,538
Upper Joseph Creek	57,827	54	27		67,213	125,121		657
Middle Columbia Basin							**5,108**	**2,861**
Meacham Creek	75,919	171	89	5,202	32,696	114,078	3,976	2,671
Umatilla River/Mission Creek	1,512	804	54	102,949	6,194	131,398		190
Birch Creek	22,683	182	0	193	74,955	182,154	215	
Upper Butter Creek	7,347	73	0		179,311	206,624	690	
Upper Willow Creek	6,646	13	0		71,990	94,097	99	
Rhea Creek	5,419	45	0		75,372	146,007	129	
John Day Basin							**8,011**	**14,609**
Upper South Fork John Day River	63,403	398	0		30,843	94,644		41
Middle South Fork John Day River	51,492	16,477	399		53,360	121,727		224
Murderers Creek	65,104	9,637	8,702		1,496	84,940		1,202
Upper John Day River	54,590	242	0		51,882	106,714	137	
Strawberry Creek	50,118	4,362	50		95,192	149,722	2,609	12
Beech Creek	40,630	121	35		30,088	70,873	617	1,800
Laycock Creek	30,417	705	630		76,499	108,251		1,428
Fields Creek	25,339	1,552	8,409		75,590	110,890		205
Upper North Fork John Day River	69,879		0		1,584	71,464		167
North Fork John Day River/Big Creek	96,879	313	1,559		7,118	105,870		4,064

Table 25. Watersheds, Ownership, and Proposed Exchange Acres (continued)

Watershed Name	Watershed Ownership Acres						Exchange Acres	
	NFS	BLM	Other	Tribal	Private	Total	FS To Con-vey	Private To Acquire
Upper Camas Creek	85,812	1,386	0		17,489	104,688		959
Lower Camas Creek	57,579	444	13,255		85,711	156,989	1,925	152
North Fork John Day River/Potamus Creek	99,568	39,230	2,556		43,927	185,282	181	159
Wall Creek	95,353	12,027	0		20,969	128,349		2,246
Cottonwood Creek	32,951	2,742	31		113,354	149,078	152	160
Lower North Fork John Day River	7,091	15,425	0		94,511	117,028	2,389	405
Upper Middle Fork John Day River	75,909	37	0		2,331	78,277		514
Camp Creek	120,691		0		5,193	125,884		112
Big Creek	64,188	290	484		46,594	111,556		441
Long Creek	29,882	78	0		100,536	130,497		163
Lower John Day River/Kahler Creek	32,893	11,789	589		152,726	197,997		156

Wetlands, Floodplains, and the Stream Network of the Exchange Area

Wetlands gains and losses were evaluated to meet Executive Order 11990. All wetlands were identified and their area measured on color aerial photography at various scales, primarily 1:24,000. At this scale, narrow wetland areas associated with smaller channels or under tree canopy cover would not be identified. Miles of stream, which would be conveyed or acquired, were used to index these potential unidentified wetlands.

Wetlands are generally identified as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas”. (U.S. Army COE, 1987). Seasonally wet meadows account for most of the identified acres of wetlands that would be included in the Proposed Land Exchange (Table 26). Most are associated with steam channels (riverine wetlands), though some are not (palustrine wetlands). Wetlands perform many functions in the hydrologic system including subsurface water storage and improvement of water quality. Their contribution to wildlife and aquatic habitat make them among the most productive of all sites.

Floodplain gains and losses were evaluated to meet Executive Order 11988. Floodplains associated with seasonally wet meadows were calculated using GIS generated channel length and assigning estimated widths. All floodplains in the Proposed Land Exchange are less than 200 feet wide (Table 26). Parcels that include portions of mainstem river bottoms were evaluated for floodplain area including the Imnaha River and several of its tributaries, Meacham Creek, and one parcel on the North Fork John Day River. Channel lengths were determined from maps (scale 1:24,000) and GIS stream network reports. Floodplain width in the Imnaha system was estimated from averages of "primary riparian widths" measured during fish habitat surveys conducted by personnel on the Wallowa-Whitman National Forest (Wallowa-Whitman National Forest, 1991-1993). Meacham Creek floodplain widths were based on cross-section measurements of flood-prone width (100 year floodplain) conducted during an assessment sponsored by the Confederated Tribes of the Umatilla Indian Reservation (Andrus and Middel, 2003). Floodplains are those areas adjacent to channels that are occupied and formed by occasional high water events. Floodplains play an important role in dissipating high velocities associated with high flow events, and in providing slow and slack water refuge areas for fish and other aquatic animals.

Table 26. Wetlands and Floodplains Acres in the Proposed Exchange

Watershed Name	Wetlands Acres			Floodplains Acres		
	Convey	Acquire	Comments	Convey	Acquire	Comments
Middle Imnaha River					14.9	mainstem
Big Sheep Creek				4.0	4.0	corners of conveyed parcels
Little Sheep Creek					6.7	mainstem
Lower Imnaha River					60.5	Horse Creek, Cow Creek, plus mainstem
Meadow Creek		15.0	Meadow Creek, McCoy Creek		3.6	mainstem
Grande Ronde River/Five Points Creek		2.2			0.0	
Wenaha River		5.0			0.0	
Chesnimnus Creek		134.0	Thomason Meadow, Steen's Ranch		7.3	mainstem
Upper Joseph Creek		24.0			9.0	mainstem

Table 26. Wetlands and Floodplains Acres in the Proposed Exchange (continued)

Watershed Name	Wetlands Acres			Floodplains Acres		
	Convey	Acquire	Comments	Convey	Acquire	Comments
Meacham Creek					14.8	Butcher Crk. Confluence
Murderers Creek		121.0	Murderer's Creek, John Young Mdw. Etc.		14.0	assoc. with wetlands
Strawberry Creek	1.8			5.3		Bear Creek
Beech Creek	0.3			0.0		
Fields Creek		22.0	Aldrich Mt.		5.9	assoc. with wetlands
Upper North Fork John Day River		67.0	Trout Mdw.		10.7	assoc. with wetlands
North Fork John Day River/Big Creek		27.0	Landslide topog, Clearcut		0.0	road between PU16G and river
Upper Camas Creek		10.3			2.4	mainstem
North Fork John Day River/Potamus Creek		8.0			1.1	
Wall Creek		32.0	Wilson Prairie		34.8	assoc. with wetlands
Lower North Fork John Day River	8.5		Includes Mud Spring	3.6		W. Fk. Deer Creek
Upper Middle Fork John Day River		146.0	Phipps Mdw., Bridge Creek Mdw.		15.0	assoc. with wetlands
Long Creek		46.0	Keeney Mdw.			
Total	**10.6**	**659.5**		**13.0**	**204.7**	

Of the 263 parcels in the Proposed Exchange, 247 have stream channels (based on FS GIS mapping). Table 27 shows the miles in each stream category by HUC 5 Watershed

Table 27. Miles of Stream by Watershed and by Stream Category in the Proposed Exchange

Watershed Name	Conveyed Miles				Acquired Miles			
	Fish Bearing	Per-ennial	Inter-mittent	Total	Fish Bearing	Per-ennial	Inter-mittent	Total
Snake River/Indian Creek				0.0	0.0	0.0	1.4	1.4
Upper Eagle Creek				0.0	0.0	0.0	2.7	2.7
Upper Imnaha River				0.0	0.0	0.0	0.2	0.2
Middle Imnaha River	0.0	0.0	3.9	3.9	4.2	0.0	9.6	13.9
Big Sheep Creek	0.5	1.3	7.9	9.7	1.6	0.0	1.3	2.9
Little Sheep Creek	0.0	0.0	0.7	0.7	2.7	0.0	3.0	5.8
Lower Imnaha River	0.2	0.0	4.3	4.5	12.7	2.8	68.9	84.5
Meadow Creek	0.7	0.0	1.6	2.3	1.5	0.0	1.1	2.6
Grande Ronde River/Five Points Creek	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Upper Wallowa River	0.0	0.8	2.2	3.0	0.0	0.6	3.0	3.5
Lostine River				0.0	0.0	0.0	0.1	0.1
Middle Wallowa River	0.0	0.0	0.9	0.9				0.0
Bear Creek	0.0	0.0	0.3	0.3				0.0
Lower Wallowa River	0.0	0.0	0.5	0.5				0.0
Grande Ronde River/Mud Creek	0.0	0.6	7.3	7.9	0.0	0.3	1.5	1.8
Wenaha River				0.0	0.0	0.0	1.7	1.7
Chesnimnus Creek				0.0	1.5	0.1	3.5	5.1
Upper Joseph Creek				0.0	3.7	0.0	2.2	5.8
Meacham Creek	2.8	9.2	17.7	29.7	3.1	6.7	12.9	22.8

Table 27. Miles of Stream by Watershed and by Stream Category in the Proposed Exchange (continued)

Watershed Name	Conveyed Miles				Acquired Miles			
	Fish Bearing	Per-ennial	Inter-mittent	Total	Fish Bearing	Per-ennial	Inter-mittent	Total
Umatilla River/Mission Creek				0.0	0.0	0.3	1.0	1.3
Birch Creek	0.0	0.4	1.3	1.7				0.0
Upper Butter Creek	0.0	0.8	1.0	1.8				0.0
Upper Willow Creek	0.2	0.0	0.2	0.5				0.0
Rhea Creek	0.0	0.3	0.0	0.3				0.0
Upper South Fork John Day River				0.0	0.0	0.0	0.3	0.3
Middle South Fork John Day River				0.0	0.0	0.0	0.5	0.5
Murderers Creek				0.0	3.3	0.0	4.6	8.0
Strawberry Creek	3.6	1.5	10.0	15.1				0.0
Beech Creek	0.5	1.2	1.6	3.2	1.0	2.7	4.3	8.0
Laycock Creek				0.0	1.2	0.0	5.9	7.1
Fields Creek				0.0	0.0	2.4	0.0	2.4
Upper North Fork John Day River				0.0	1.2	0.3	0.3	1.8
North Fork John Day River/Big Creek				0.0	2.1	8.6	18.8	29.5
Upper Camas Creek				0.0	2.3	0.5	4.6	7.4
Lower Camas Creek	0.0	1.5	7.4	8.9	0.0	0.4	0.6	1.0
North Fork John Day River/Potamus Creek	0.0	1.0	0.4	1.4	0.4	0.0	1.2	1.7
Wall Creek				0.0	3.8	2.7	9.2	15.7

Table 27. Miles of Stream by Watershed and by Stream Category in the Proposed Exchange (continued)

Watershed Name	Conveyed Miles				Acquired Miles			
	Fish Bearing	Per-ennial	Inter-mittent	Total	Fish Bearing	Per-ennial	Inter-mittent	Total
Cottonwood Creek	0.0	0.0	0.2	0.2				0.0
Lower North Fork John Day River	1.4	0.8	4.9	7.0	0.0	0.0	1.2	1.2
Upper Middle Fork John Day River				0.0	2.1	0.2	1.4	3.7
Camp Creek				0.0	0.0	0.0	0.1	0.1
Big Creek				0.0	2.3	0.7	2.0	5.1
Lower John Day River/Kahler Creek				0.0	0.0	0.0	0.5	0.5
Total	**9.9**	**19.5**	**74.2**		**50.8**	**29.4**	**169.7**	

Water Quality and Riparian Condition of the Exchange Area

Forested vegetation information was developed for each parcel in the Proposed Land Exchange; see "Blue Mountain Land Exchange Upland Forest Vegetation", 2003 in the PR. Nearly half (58/126) of the parcels in the Lower Snake Basin are non-forested and are located in the Lower and Middle Imnaha River, the Big and Little Sheep Creek, and the Chesnimnus Watersheds.

Of the parcels with forested stands, many include non-forested acres so that acres of forested structure does not equal parcel acreage. Generally, forest cover is concentrated near channels, therefore, forest stand structure indicates streamside vegetation structure. Since nearly all parcels have stream channels, forest structure information on all parcels was used in this analysis. Stand initiation (SI) indicates young stands that would not provide shade or woody debris to channels due to the size of the trees and low expected natural mortality. Mid-structure indicates stands with tree heights that would provide shade, but little woody debris to channels. Late structure indicates old stands that would provide both shade and woody debris to channels. The Hydrology Specialist Report in the PR has a table displaying forest stand structure for all parcels in the Proposed Exchange Alternative by watershed.

Environmental Consequences

The measurement indicator of net changes in ownership will be used to evaluate the potential for changes in wetlands and floodplain condition and function. Changes in forest stand structure will be the measurement indicator used to evaluate potential for changes in water quality, riparian condition, and water yield. It is assumed, for the purposes of this analysis, that merchantable timber will be harvested within ten (10) years on private lands and harvesting would be in compliance with the State of Oregon Forest Practices Act and Rules. It is further assumed the Forest Plan standards on the three National Forests party to this exchange would be implemented

for all management activities on NFS lands. Since young (SI) stands are not merchantable, they will not be carried forward in the hydrologic analysis.

In the Proposed Exchange Alternative, six (6) watersheds account for 50% of exchange acres, twelve (12) watersheds account for 75% of exchange acres, and twenty (20) watersheds account for 90% of exchange acres. Forested vegetation information was developed for each parcel in the exchange (Diskin, 2003).

Stand structure information was used to analyze changes in the age distribution of forested stands as an indicator of the potential for changes in water quality and riparian condition as a consequence of anticipated planned management actions. Table 28 summarizes this information by alternative. The hydrology specialist report in the PR shows the distribution of stand structure across the 47 watersheds in the proposed exchange.

Table 28. Summary of Forested Structure by Alternative (Acres)

	Alt.1 Convey	Alt.1 Acquire	Alt.2 Convey	Alt.2 Acquire	Alt.3 Purchase	Alt.4 Convey	Alt.4 Acquire
Mid	10212	16255	0	0	859	10212	7516
Late	2648	697	0	0	4	2648	439
Total	13958	20313	0	0	863	13958	8967

SI – Stand Initiation, Mid – Mid-structure Stand Development, Late – Late Structure Stand Development

Harvest of conveyed lands to Oregon State Practices Act standards would allow harvest in or near channel areas that would not occur under current management by the FS. Forest Practices rules provide protection to ground cover and stand structure very near fish bearing, domestic supply, and larger channels (within 20 feet), restrict road development within 100 feet and skid trails within 35 feet of fish bearing streams for the largest streams. Roads are not located within RMAs. Short season intermittent channels do not have identified RMAs, and skid trail location and basal area retention is not required.

Forested acres conveyed have a long history of management. Since the 1995 adoption of PACFISH/INFISH (Table 24), land near stream channels has been managed to provide vegetative components at site potential and to avoid ground disturbance near channels, and to prevent sedimentation into streams from harvest and other vegetation management activities (thinning, fuels reduction, etc.). Acquired lands would be managed to these standards unless changed through Forest Plan revision.

Stand structure within a mature tree height of stream channels provides direct benefits to water quality and to channels; shade, sediment storage, large wood structure, other material that contributes instream nutrients (FEMAT, 1993). Indirect effects to shade and to water temperature could occur where stand density is reduced within 50 to 100 feet of perennial or long flowing intermittent channels. Harvest within one to two mature tree heights of channels reduces down wood adjacent to and in the channel. This material plays an important sediment trapping function in both locations. Instream wood also plays an important role in the creation of fish habitat and in many streams is important to the morphology and stability of the channels themselves. Logging near channels removes the source of these benefits and modifies the age distribution of forest structure.

Soil disturbance associated with logging; temporary road construction, skid trail development, cable corridors, landing construction, opens the ground up to erosion. The amount and location of soil disturbance varies with logging system, harvest prescription, and riparian protection. Even-age harvest practices intensify these effects by removing more material and by disturbing more ground cover. On private land, management is generally not geared toward retention of late and old structure**.**

State Forest Practices Rules would protect water temperature to some degree, but some shade removal would be expected. For most parcels in the Proposed Land Exchange measurable increases in water temperature are unlikely to occur if Forest Practices Rules are followed. Localized soil disturbance near channels and removal of trees from near channel areas would lead to localized erosion and sedimentation effects (Belt et al, 1992). Long-term effects would be expected from reduced down and large wood over the life cycle of a stand.

Created openings in forested stands may lead to changes in transpiration and the timing and rate of snowmelt, which can lead to changes in water yield and peakflows. These relationships have been studied and documented by numerous studies. Recent reviews of literature demonstrate that the relationship is highly variable (Stednick, 1995 and Scherer, 2001). Generally, flow effects are not seen at less than a 15-20% reduction in hydrologically mature stands. Effects were not seen below 50% reductions in a multi-year study on the Umatilla National Forest (Helvey, 1995). Forested stands are estimated to reach hydrologic maturity at 25 years (Clifton, 1995). Mid and Late structure are assumed to be hydrologically mature in this analysis.

For most subwatersheds in the exchange, harvest on conveyed parcels would be insignificant relative to water yield and there would be no effect to this parameter. Hydrologic indicators are most sensitive at smaller scales. The fifteen (15) subwatersheds (SWS) where 5% or more of subwatershed acres are included in the Proposed Land Exchange were evaluated in detail (Table 29). Five percent (5%) was chosen as a conservative estimate of potential for cumulative effects of harvest on water yield. The hydrology specialist report has a table in the PR that summarizes the merchantable timber structure for these subwatersheds.

Table 29. Subwatersheds with 5% or More of Their Acres in the Land Exchange

Subwatershed Name	Total SWS Acres	% SWS in Exchange	Conveyed Acres	% SWS Conveyed	Acquired Acres	% SWS Acquired
Imnaha River/Deer Creek	22998	5.2%	39	0.2%	1154	5.0%
Big Sheep Creek/Carrol Creek	16580	6.7%	1103	6.7%		
Lower Horse Creek	12742	8.0%			1020	8.0%
Imnaha River/Thorn Creek	20852	18.3%			3808	18.3%
Lower Mud Creek	10995	12.2%	947	8.6%	397	3.6%

Table 29. Subwatersheds with 5% or More of Their Acres in the Land Exchange (continued)

Subwatershed Name	Total SWS Acres	% SWS in Exchange	Conveyed Acres	% SWS Conveyed	Acquired Acres	% SWS Acquired
Dry Gulch	11967	6.8%			813	6.8%
Upper Chesnimnus Creek	19000	6.9%			1303	6.9%
Butcher Creek	25760	25.8%	3971	15.4%	2671	10.4%
Bark Cabin	15995	6.6%			1056	6.6%
Bear Creek	12448	20.2%	2516	20.2%	2	0.0%
North Fork John Day/Oriental	15740	8.8%			1392	8.8%
Texas Bar	19904	13.4%			2672	13.4%
Snipe	27606	5.0%	1377	5.0%		
Upper Wilson	26657	6.7%			1780	6.7%
Upper Deer Creek	16467	15.1%	2249	13.7%	239	1.5%

Alternative 1: Proposed Exchange

Wetlands and Floodplains

Tables 26 and 27 in the previous Affected Environment displays by HUC5 watersheds the acres of conveyed and acquired wetlands, floodplains, and miles of stream in the exchange. The direct effects for Alternative 1 are summarized below (Table 30).

Table 30. Summary of Wetlands, Floodplains, and Stream Channel by Alternative

	Alt. 1 Convey	Alt. 1 Acquire	Alt. 2 Convey	Alt. 2 Acquire	Alt. 3 Purchase	Alt.4 Convey	Alt.4 Acquire
Wetland Acres	11	659	0	0	7	11	347
Floodplain Acres	13	205	0	0	67	13	168
Fish Bearing Streams Miles	10	51	0	0	14	8	37
Perennial Streams Miles	20	29	0	0	2	19	14
Intermittent Streams Miles	74	170	0	0	33	73	116

Alternative 1 would acquire 60 times more acres of wetlands and 16 times more acres of floodplains than it would convey. Discussion on major individual wetland and floodplain acquisition is documented in the Hydrology Specialist Report in the PR.

Acquired wetlands include numerous meadows in varying condition. Nearly all of the parcels with acquired wetlands (seasonally wet meadows) are in existing allotments and would continue to be grazed. Grazing standards for the proposed acquired lands were adopted into the Forest Plans in 1995 from PACFISH. Current grazing management would continue after the exchange. Acquired wetlands with adjacent timber would be protected from logging and associated activities by PACFISH RHCA Standards and Guides designed to protect hydrologic function and habitat values.

Conveyed wetlands are mostly narrow and adjacent to streams or seasonally wet meadows. The Oregon Forest Practices Act and the OARS Water Protection Rules are intended to protect them from direct impacts of logging and discourage road construction that could damage their hydrologic function.

Acquired floodplains are mostly relatively narrow and confined by steep canyon walls. The Butcher Creek confluence with Meacham Creek channel has a relatively wide floodplain, resulting in the acquisition of 15 acres of floodplain.

Conveyed floodplains are mostly small segments of floodplain associated with seasonally wet meadows. They are less than 20 feet wide and located in remote areas with little development pressure. There would be no increase in flood hazard from the conveyance of 13 acres of floodplains.

Stream Channels

The NFS would acquire approximately 2.4 times as many miles of stream as would be conveyed (Table 27). This includes about 5 times the number of miles of fish bearing streams, 1 ½ times more perennial non-fish bearing steams, and more than twice the miles of intermittent streams. The Imnaha system, Meacham Creek, and the North Fork John Day (Texas Bar sub watershed) account for most miles. Streams that would be acquired would be managed according to PACFISH/INFISH standards. Standards and Guides applied to interim RHCA widths would protect any wetlands adjacent to channels that have not otherwise been identified.

Conveyed streams would have less protection. The Oregon Forest Practices Act and the OARS Water Protection rules are intended to protect narrow wetlands associated with streams.

Water Quality, Riparian Condition, and Water Yield

Parcels in the Proposed Land Exchange are widely dispersed and generally make up a very small portion of the land base at a Watershed (HUC 5) or Subwatershed (HUC 6) scale (Table 29). Generally, the magnitude of water quality effects of the land exchange would be expected to be low on both the watershed and subwatershed scale. The magnitude of effect would be related to geographically concentrated harvest activities and to the time frame in which they would occur. Subwatersheds with substantial acres in the Proposed Land Exchange are discussed below.

Subwatersheds with Conveyed Timbered Lands- Water Quality, Riparian Condition, and Water Yield

Butcher Creek Subwatershed

Meacham and Butcher Creeks are fish-bearing streams that are subsurface for portions of the year in exchange parcels. The Butcher Creek subwatershed has a high percentage of its acres proposed for exchange. The exchange proposal would block up land on either side of Meacham Creek and lower Butcher Creek. Butcher Creek has good channel condition.

The FS would convey about 1 ½ times as much merchantable forest structure (convey 2,700 acres of mid and late forest structure, and acquire 1,690 acres of mid and late forest structure). It would be expected that the conveyed merchantable material would be harvested within 10 years. Protections for streams would decline on conveyed lands and would increase on acquired lands. There is nearly no surface water during summer months in the conveyed parcels therefore harvest near channels on these lands would not affect water temperature on site or downstream of the project area.

Soil disturbance near channels would increase on conveyed parcels due to logging and accompanying activities. This could lead to increased sedimentation into Butcher Creek and Meacham Creek for several years following harvest. Recruitment of woody structure in Butcher Creek would be reduced over the long term as young stands replaced mid and late stands. This would adversely affect channel morphology and sediment routing. Most of Meacham Creek in the area of these parcels is within or immediately adjacent to the Railroad right-of-way and is outside of parcel boundaries. Future downed wood and sediment storage capacity for non-fish bearing streams, intermittent streams, and ephemeral draws would be reduced over the long term on conveyed parcels and would be protected on acquired parcels. More miles of these streams would be conveyed under Alternative 1 than would be acquired.

Harvest on conveyed lands would reduce or eliminate hydrologically mature forested cover on up to about 10.5 % of the acres in the Butcher Creek subwatershed over the next 10 years. Of the private timberlands in the subwatershed that could be harvested, about 6½% of the mature forest cover in the subwatershed would be acquired. Information about existing levels of harvest on private lands in this subwatershed is limited and the incremental effect of the proposed exchange would not be measurable. NFS lands were evaluated in 2000 and had less than 5% reduction in hydrologically mature forest cover (Umatilla and Meacham Ecosystem Analysis, 2000).

Bear Creek Subwatershed

Bear Creek is a tributary to the John Day River, north and west of Prairie City. Private lands surround NFS lands in this subwatershed and most of the mainstem of Bear Creek is on private land. The FS would convey about 2,500 acres and no acres would be acquired. Channel condition in this subwatershed is relatively poor due to deficient streamside vegetation. An old breeched, earthen dam near the forest boundary is evidence of historic mining. Streamside vegetation is lacking shrubs and has short stubble height (field visit October, 2003). Currently logging is occurring on private lands. Grazing is occurring on both private and public lands.

About 20% of the mature forested structure in this subwatershed would be conveyed in the Proposed Land Exchange. With up to 20% of the forested stands likely to be logged within the next decade, stream temperature could be increased. Oregon State Forest Practices rules would protect trees within 20 feet of perennial streams in this subwatershed and would require higher basal areas to be left near channels. This would protect some of the existing shade component, but

not all of it. Soil disturbance near channels would increase due to logging and accompanying activities. Increases in erosion and sedimentation would be expected and turbidity and sediment deposition into Bear Creek would increase for several years following logging. Decline in recruitment of woody structure in Bear Creek would be seen over the long term as young stands replaced mid stands. This would adversely affect channel morphology and sediment routing. Future downed wood and sediment storage capacity for perennial streams, intermittent streams, and ephemeral draws would be reduced over the long term on conveyed parcels.

A reduction in hydrologically mature timber stands of 20% over a decade in this subwatershed could lead to small changes in water yield and timing of peakflows. Information about existing levels of harvest on private lands in this subwatershed is limited and it is unlikely that the incremental effect of the proposed exchange would be measured due to background variability. It is unlikely any change to peakflow would affect channel morphology or cause bank erosion.

Upper Deer Creek Subwatershed
The West Fork of Deer Creek drains the exchange parcels and is headwater to Deer Creek, a tributary of the North Fork John Day River. National Forest ownership in this area is scattered and the exchange proposes to convey about 2,000 acres in this subwatershed and acquire about 200 acres to block up ownership.

About 12% of the mature forested stand acres in this subwatershed would be conveyed. Oregon Forest Practices rules would protect a portion of the shade component on harvested lands however water temperature could increase in the subwatershed. Soil disturbance near channels would increase due to logging and accompanying activities. Increases in erosion and sedimentation would be expected and turbidity and sediment deposition into the West Fork of Deer Creek and its tributaries would increase for several years following logging. Decline in recruitment of woody structure in subwatershed channels would be seen over the long term as young stands replace mid stands. This would adversely affect channel morphology and sediment routing. Future downed wood and sediment storage capacity for perennial streams, intermittent streams, and ephemeral draws would be reduced over the long term on conveyed parcels.

Harvest on conveyed lands would reduce or eliminate hydrologically mature forested cover on up to about 12% of the acres in the Upper Deer Creek subwatershed over the next 10 years. Information about existing levels of harvest on private lands in this subwatershed is limited and it is unlikely that the incremental effect of the proposed exchange would be measurable due to background variability.

Subwatersheds with Acquired Lands (Timbered Lands) - Water Quality, Riparian Condition and Water Yield

In the remaining subwatersheds with more than 5% of their timbered acres in the Proposed Land Exchange, the National Forest System would acquire the following acres:

Dry Gulch Subwatershed, tributary to the Wenaha River 650 timbered acres from ODFW
Bark Cabin Subwatershed, Murderers Creek 950 timbered acres from ODFW
Texas Bar Subwatershed, tributary to the North Fork. John Day River 2150 timbered acres

About 11% of forested stands in the above SWS would come into the NF system. Based on the harvest assumptions of this analysis, these acres would not be harvested within the next 10 years and any future activities would meet PACFISH standards. There are about 2 miles of fish bearing

streams, 4 miles of other perennial streams, and 13.5 miles of intermittent stream in these parcels that would be protected to a higher standard in Alternative 1.

No timber sale activities are planned on acquired lands within the next 10 years. Acquired lands would be managed in accordance with individual Forest Plans, which incorporate PACFISH/INFISH Standards and Guides. Any management activity would be designed to maintain or recover the components of healthy riparian areas and water quality.

Subwatersheds with Acquired Lands (Clearcut Lands) - Water Quality, Riparian Condition and Water Yield

Upper Wilson Subwatershed, near Wilson Prairie: About 1,720 acres of recently clearcut lands (SI structure) would be acquired. This accounts for about 6½% of the subwatershed. Logging activity occurred within the last year. Indirect effects, including increased water temperature and sedimentation, are ongoing.

Subwatersheds with Acquired Lands (Non-forest Lands) - Water Quality, Riparian Condition and Water Yield

Substantial acres of non-forested land would be acquired in the Lower Imnaha River Watershed.

Lower Horse Creek Subwatershed 753 acres representing 5.9% of SWS

Imnaha River/Thorn Creek Subwatershed 3,623 acres representing 17.4% of SWS

These acquisitions are river bottomlands and would bring high resource value lands into the NFS. Acquisition of wetlands and floodplains by the NFS would lead to increased protection of these sensitive areas as Forest Plan (PACFISH/INFISH) standards and guides would be implemented.

Alternative 1- Summary

The net increase in stream channels, and wetland and floodplain acres would protect wetland and floodplain function to PACFISH standards. Conveyed wetlands are mostly narrow and adjacent to streams or seasonally wet meadows. The Oregon Forest Practices Act and the OARS Water Protection Rules would protect them from direct impacts of legging and discourage road construction that could damage their hydrologic function. Conveyed floodplains are mostly small segments of floodplan associated with seasonally wet meadows. They are less than 20 feet wide and located in remote areas with little development pressure. There would be no increase in flood hazard from the conveyance of 13 acres of floodplains. Wetland acres are generally seasonally wet meadows. These meadows are nearly all inside existing grazing allotments. Forest Plan grazing standards currently apply and no change would occur after acquisition.

Parcels in the Proposed Land Exchange are widely dispersed and generally make up a very small portion of the land base at a Watershed (HUC 5) or Subwatershed (HUC 6) scale. Effects to water quality, riparian condition, and water yield would be localized, and generally too small to be measured. In those subwatersheds with a large number of acres of merchantable timber proposed to convey: Butcher Creek Subwatershed, Bear Creek Subwatershed, and Upper Dry Gulch Subwatershed; erosion and sedimentation would likely increase for one to two years following harvest and associated activities. Water temperatures could be affected, but State Forest Practices rules protect at least a portion of existing shade. Woody recruitment and sediment storage would be reduced over the long term due to changes in stand structure. In Butcher Creek, acquisition of

merchantable stands which otherwise would be harvested would offset to some extent (11% conveyed, 6.6% acquired) the conveyance of merchantable stands. Water yield is unlikely to be measurably affected by harvest of conveyed stands.

Acquisitions of large blocks of timberland in Texas Bar would protect, to Forest Plan standards, about 11% of the subwatershed which is tributary to the North Fork John Day River. There would be no change in management due to the acquisition of parcels in the Dry Gulch and Bark Cabin Creek subwatersheds, which currently belong to the State of Oregon Department of Fish and Wildlife and are managed for habitat.

Alternative 2: No Action

Under the No Action Alternative, no parcels would be acquired or conveyed.

Wetlands and Floodplains

The opportunity to bring substantial acres of seasonally wet meadow, acres of floodplain, and miles of stream channels into public ownership would be forgone. Current NFS management standards are directed to maintain, protect, and recover the components necessary for riparian, aquatic, and hydrologic systems to function at high levels of productivity. Protection of these systems that would be acquired under Alternative 1 would not occur under FS management. In the Bark Cabin and Dry Gulch subwatersheds, ODFW management would continue and wetland management would not differ between the No Action and Proposed Exchange Alternative. Grazing management on non-acquired parcels would continue to be under NFS allotments, which are subject to PACFISH and INFISH standards. There would be no conveyance of the very few acres of wetland and floodplain identified in the Proposed Land Exchange.

Water Quality, Riparian Condition and Water Yield

It is assumed that merchantable timber on non-acquired private parcels would be harvested within 10 years and that merchantable timber on non-conveyed National Forest parcels would not be harvested.

Merchantable stand structure in excess of 5% of SWS acres would not be conveyed in Butcher Creek, Bear Creek, or Upper Deer Creek subwatersheds. Non-acquired parcels would have merchantable stand structure in excess of 5% of SWS acres in Dry Gulch, Butcher Creek, Bark Cabin Creek, and Texas Bar subwatersheds.

Dry Gulch
About 643 acres of merchantable timber stands would not be conveyed in this alternative. These parcels are owned by the State of Oregon and managed by ODFW for habitat. It is unlikely that these parcels would be managed as commercial timberlands. There would be no adverse effects to water quality or riparian condition from ongoing management in Alternative 2. Alternatives 1 and 2 would result in the same water quality, riparian condition, and water yield in this subwatershed.

Butcher Creek
In this alternative, merchantable timber stands would not be conveyed on about 2,700 acres and would not be acquired on about 1,700 acres. Harvest on non-acquired parcels would amount to 6.6% of the subwatershed acres. The net difference between the Proposed Land Exchange and Alternative 2 would be a 1,000-acre reduction in harvest, about 4% less of the subwatershed, in Alternative 2. Streams in the non-exchanged parcels are intermittent or subsurface during the

summer. There would be no affect to water temperature from harvest of non-acquired parcels. Harvest associated soil disturbance, sedimentation into channels, and declines in woody structure recruitment would be similar to but less than Alternative 1. It should be noted that logging on other private acres has occurred in the past, and other acres could be logged in the future.

Bark Cabin
Approximately 930 acres or 5.8% of the subwatershed would not be acquired in this alternative. These parcels are owned and managed by Oregon Department of Fish and Wildlife (ODFW). They are not likely to be managed for timber production, and no negative effects to water quality or riparian condition would be expected from management on these parcels in the No Action Alternative. The Proposed Exchange and the No Action Alternative would result in similar water quality, riparian condition, and water yield.

Bear Creek
Approximately 2,500 acres of merchantable structure would not be conveyed in this alternative. Adverse effects to water quality, riparian condition, and channel structure associated with logging and discussed in Alternative 1 would not occur.

Texas Bar
About 2,100 acres of timberland would remain private rather than be conveyed to the FS. Harvest of these stands could lead to an increase in water temperature and sedimentation and a reduction in woody recruitment. There are about 2 miles of fish bearing streams, 4 miles of other perennial streams, and 13.5 miles of intermittent stream in these parcels.

Upper Deer Creek
About 2,000 acres (12% of the SWS) of merchantable timber would not be conveyed in this alternative. Adverse effects to water quality, riparian condition, and channel structure associated with logging and discussed in Alternative 1 would not occur.

Alternative 2- Summary

Floodplains and wetlands would be managed as they currently are. Wetlands in Dry Gulch subwatershed and Bark Cabin Subwatershed are currently owned by ODFW and are managed for habitat. Other non-acquired wetlands could have management actions, which would affect their hydrologic function, especially water storage, and habitat function. Non-acquired floodplains could be managed in ways that would prevent the attainment of the potential vegetation community. No increase in flood hazard would be expected due to non-acquisition of offered floodplains. Grazing management of seasonally wet meadows would continue in NFS allotments and would not change.

Water quality effects from harvest of non-conveyed lands in Bear Creek and Upper Deer Creek subwatersheds would not occur. In Texas Bar and Butcher Creek Subwatersheds, non-acquired merchantable stands would be logged. In Butcher Creek, there would be a net reduction in harvest of privately owned merchantable timber, since non-conveyed acres exceed non-acquired acres. Detrimental water quality effects would decrease and recruitment of woody material would increase in Butcher Creek subwatershed relative to Alternative 1. In Texas Bar subwatershed detrimental effects to water quality and woody recruitment would increase compared to Alternative 1.

Alternative 3: Purchase

The number of acres in the exchange drops substantially from the Proposed Land Exchange as no lands would be conveyed, and prioritized parcels would be purchased up to a given funding level. Parcels were prioritized to acquire wilderness, wild and scenic river corridors, and protect T&E plant and animal species.

Wetlands and Floodplains

Financial limitations decrease the acreage of wetlands, floodplains, and miles of channels that would be purchased. High priority parcels purchased inside the Imnaha Wild and Scenic River corridor and HCNRA would add 67 acres of floodplain to the NFS. The opportunity to provide public protection to most channels and wetlands identified in Alternative 1 would be forgone.

Water Quality, Riparian Condition and Water Yield

Table 31 summarizes the distribution of forested structure for Alternatives 3 and 4. Of the 15 subwatersheds analyzed in detail, most have no acres included in Alternative 3. Since no land would be conveyed, and little forest structure is acquired, risks and benefits associated with possible logging on conveyed lands would not occur. The effects of this alternative are very similar to effects of Alternative 2. Purchase of parcels in the Imnaha watershed would bring those non-forested parcels into NFS management with associated management of riparian areas. No acres would be purchased in Butcher Creek, Bear Creek, Texas Bar, or Upper Deer Creek subwatersheds. Other effects related to non-acquired lands in Texas Bar SWS and Butcher Creek would be similar to those described in Alternative 2.

Table 31. Summary of Forested Structure by Alternative (acres)

	Mid	Late
Alternative 1		
Convey	10212	2648
Acquire	16255	697
Alternative 2		
Convey	0	0
Acquire	0	0
Alternative 3		
Acquire	859	4
Alternative 4		
Convey	10212	2648
Acquire	7516	439

Alternative 3- Summary

Floodplains in the Imnaha River would be purchased and protected to Forest Plan standards and guides. Most floodplains and wetlands identified in the Proposed Land Exchange would not be purchased. Wetland protection and function would not be provided to these acres. There would be no increased risk of flood hazard as most floodplains would remain in their existing condition and are not susceptible to development. Cumulative effects for water quality, riparian condition, and water yield would be very similar to Alternative 2.

Alternative 4: Deed Restriction

Parcels conveyed would be the same as Alternative 1, however, deed restrictions would reduce the value of those acres, resulting in less acquired acres. Parcels were prioritized to acquire wilderness, wild and scenic river corridors, and protect T&E plant and animal species.

Wetlands and Floodplains

Effects to wetland condition and flood hazard on conveyed parcels are negligible and similar to Alternative 1 (Table 26). This alternative would acquire about 50% of the acres of wetlands and 80% of floodplains acres when compared to Alternative 1. Floodplains on the mainstem of the Imnaha River, Cow Creek, Horse Creek, and in Meacham Creek would be acquired. Most non-acquired acres of floodplain are associated with wetlands that would also not be acquired. An additional 126 acres of wetland not acquired are currently owned by ODFW and would continue to be managed for riparian and wildlife values. Many of the most valuable wetland acres would be acquired, including Phipps Meadow, portions of the Chesnimnus Creek wetlands, and Trout Meadow.

Non-acquired wetlands like Aldrich Mountain, Keeney Meadow, most of Wilson Prairie and others, would not receive the level of protection offered by PACFISH. Protection of these areas would be forgone in most instances.

Grazing management of all wetlands, whether acquired or not, would continue to be under FS allotments which are subject to PACFISH and INFISH standards.

Water Quality, Riparian Condition, and Water Yield

Deed restrictions for conveyed parcels in this alternative would prohibit harvest inside of RHCAs and would prohibit harvest of trees larger than 21 inches. Road management and grazing management would meet Forest Plan standards.

Conveyed stand structure acres would be the same in this alternative as Alternative 1. Acquired stand structure would be substantially less.

Deed restrictions would protect canopy cover and shade currently and in the future. They would protect potential stand density and maintain and allow for recovery of water temperatures. No-harvest areas, restrictions on road building, and livestock holding restrictions would prevent soil disturbance near channels. Erosion and sedimentation from harvest of conveyed lands would be substantially less than in Alternative 1. Water quality would be maintained near its present condition, and management under the deed restrictions would provide for recovery of riparian management objectives to the same degree as PACFISH standards on NFS lands. The deed restrictions would protect woody structure recruitment over time resulting in no effect to channel stability or morphology due to harvest on conveyed parcels.

Less than half the acres of forested stands would be acquired under this alternative when compared to Alternative 1. About one-quarter the acres of young (SI) stands would be acquired and less than half the merchantable stands (mid or late structure) would be acquired. The non-acquired stands are assumed to be harvested to Oregon Forest Practices standards within a decade. Parcels acquired in the Imnaha River and its tributaries are similar to Alternative 1.

Alternative 1 proposed to acquire merchantable structure greater than 5% of subwatershed acres in four subwatersheds. In this alternative, many of these Alternative 1 acres would not be acquired.

Dry Gulch and Bark Cabin
These parcels are owned by ODFW and would not be acquired but would be managed for wildlife values. There would be no change in the risk to water quality or water yield.

Texas Bar
About two-thirds of the young (SI) stands and all of the merchantable acres would be acquired. PACFISH standards would be applied to all management activities.

Butcher Creek
Alternative 4 would not acquire about 1,500 acres of merchantable stands or about 6% of subwatershed acres. Harvest of these stands would be controlled by the Oregon Forest Practices Rules and would not be controlled by the deed restrictions. In this alternative, about 16% of subwatershed acres would be harvested in the next 10 years. About 10% of the subwatershed harvest would have deed restrictions, which would protect water quality at a high level and about 6% would not. The effects to water quality and riparian condition in this subwatershed for this alternative would be similar to and somewhat smaller than Alternative 2.

Alternative 4- Summary

The deed restrictions would not directly affect the percentage of subwatershed acres in a hydrologically mature condition. Restrictions on harvest of trees greater than 21 inches would reduce, to an unknown extent, the number of trees removed from merchantable stands. This deed restriction would further reduce the small risk of increases in water yield identified in other alternatives. In Butcher Creek subwatershed, an increase in harvested acres resulting from acquiring fewer parcels would be unlikely to affect water yield to a measurable degree, and no effects to channel stability or morphology would be expected.

About 80% of the floodplains identified in Alternative 1 would be acquired. There would be no increase of flood hazard due to the implementation of Alternative 4. About 50% of the acres of wetlands identified for acquisition in Alternative 1 would be acquired in this alternative. The 125 acres of wetland in ODFW ownership would not be acquired but would continue to be managed for riparian and habitat values. Acquired wetlands would receive increased protection from Forest Plan standards and guides. Non-acquired wetlands would forego these protections. Preservation of wetland function would decrease in Alternative 4 relative to Alternative 1. Grazing management would not change as would be the case in all alternatives because nearly all seasonally wet meadows identified as wetlands in exchange parcels are grazed under FS allotments.

Deed restrictions on conveyed parcels would maintain water quality and riparian condition at its current level and allow recovery of their components. On acquired acres, water quality and riparian condition would receive these same protections. In subwatersheds where merchantable timber stands exceeded 5% of the subwatershed, only Butcher Creek Subwatershed would see more acres harvested than in Alternative 1 (16%). Ten percent of subwatershed acres would have deed restrictions that would protect water quality at a high level and 6% subwatershed acres would not. Although more acres would be harvested in Alternative 4 than any other alternative, the effects to water quality and riparian condition of Alternative 4 would be less than Alternative

1 due to deed restrictions, and about the same as Alternative 2. Measurable effects to water yield would be unlikely.

Clean Water Act

Implementation of the Clean Water Act has been assigned to the State of Oregon and is administered by the Oregon Department of Environmental Quality (DEQ). Water quality standards have been established for the protection of beneficial uses. They describe thresholds or limits for various chemical, biological, and physical parameters. EPA has recently approved new water temperature standards for the State of Oregon.

Beneficial uses are identified for river basins and for the areas in the Proposed Land Exchange. They include fish habitat (both spawning and rearing), wildlife use, recreation, and downstream irrigation.

The Clean Water Act requires States to develop Total Maximum Daily Load (TMDL) allocations and Water Quality Management Plans (WQMP) in basins where water bodies are listed as water quality impaired (303(d) list), that is, do not meet State Water Quality Standards. The current 303d list was developed in 2002 and is based on the water quality standards in place at that time.

Two basins in the Proposed Land Exchange, the Umatilla River Basin and the Upper Grande Ronde Sub-Basin, have completed TMDLs and WQMPs which establish water quality goals for streams in the Basins. These documents lay out steps toward meeting the goals by establishing numeric goals for allowable levels of pollution (loads) by sub-basin within the larger basin. On NFS Lands, the WQMPs rely on current laws, management plans, and Best Management Practices (BMPs) to provide the basis for improving water quality in the forested landscape. They must follow standards and guidelines (S&Gs) listed in PACFISH, the Biological Opinion for PACFISH, the Biological Opinions for the Land and Resource Management Plans, the Wallowa-Whitman and Umatilla National Forest Land and Resource Management Plans, and BMPs.

On non-Federal forest lands, OAR Chapter 340, #0028, (e) is in effect:

> (e) Forestry on State and Private Lands. For forest operations on State or private lands, water quality standards are intended to be attained and are implemented through best management practices and other control mechanisms established under the Forest Practices Act (ORS 527.610 to 527.992) and rules thereunder, administered by the Oregon Department of Forestry. Therefore, forest operations that are in compliance with the Forest Practices Act requirements are (except for the limits set out in ORS 527.770) deemed in compliance with this rule. DEQ will work with the Oregon Department of Forestry to revise the Forest Practices program to attain water quality standards.

I conclude that the conveyance of parcels would be in compliance with the CWA under the Forest Practices Rules.

Table 32 shows which watersheds in the exchange have water quality impaired streams. Listed stream segments are not located in all of the parcels in these watersheds, but waters draining from them would enter impaired water bodies. With the exception of those with approved TMDLs, nearly all watersheds in the exchange are listed for water temperature. There are a few listings for

sedimentation and fecal coliform. In general, the mainstem of rivers are listed, as well as some of the tributary streams.

There are no public drinking water supplies on any of the parcels proposed for exchange.

Table 32. Watersheds with Water Quality Impaired Stream Segments

Watershed Name	Total Acres	303d Listing Criteria	Exchange Acres	
			To Convey	To Acquire
Middle Snake/Powder River Basin		TMDL target date 2005	42	454
Snake River/Indian Creek	117,736	None		143
South Fork Burnt River	75,278	None	42	
Upper Eagle Creek	123,438	None		311
Lower Snake Basin		TMDL target date 2004	5,007	13,789
Hells Canyon Subbasin				
Snake River/Divide Creek	103,415			4
Imnaha Subbasin				
Upper Imnaha River	90,388	Temperature		36
Middle Imnaha River	87,946	Temperature	244	1,274
Big Sheep Creek	88,975	Temperature	1,348	261
Little Sheep Creek	129,820	Temperature	82	458
Lower Imnaha River	147,098	Temperature	452	6,641
Upper Grande Ronde Subbasin		TMDL Completed 1999		
Meadow Creek	115,909	TMDL	388	241
Grande Ronde River/Five Points Creek	87,882	TMDL	9	36
Wallowa River Subbasin		TMDL target date 2004		
Upper Wallowa River	157,739	Temperature, Fecal Coliform, Sedimentation, pH	409	481
Middle Wallowa River	84,971		124	
Lower Wallowa River	110,040		70	
Lostine River	58,073	Sedimentation	13	4
Bear Creek	46,409	Temperature	82	

Table 32. Watersheds with Water Quality Impaired Stream Segments (continued)

Watershed Name	Total Acres	303d Listing Criteria	Exchange Acres	
			To Convey	To Acquire
Lower Grande Ronde Subbasin				TMDL target date 2004
Grande Ronde River/Rondowa	114,619	Temperature		157
Grande Ronde River/Mud Creek	154,048	Temperature	1,788	1,034
Wenaha River	189,093	Temperature		969
Chesnimnus Creek	122,640	Temperature Sediment		1,538
Upper Joseph Creek	125,121	Temperature		657
Middle Columbia Basin			5,108	2,861
Umatilla Subbasin		TMDL Completed 2001		
Meacham Creek	114,078	TMDL	3,976	2,671
Umatilla River/Mission Creek	131,398	TMDL		190
Birch Creek	182,154	TMDL except Iron	215	
Upper Butter Creek	206,624	TMDL except Iron	690	
Willow Creek Subbasin		TMDL target date 2004		
Upper Willow Creek	94,097	Fecal Coliform Chloriphyll a	99	
Rhea Creek	146,007		129	
John Day Basin		TMDL target date 2006	8,011	14,609
Upper John Day Subbasin				
Upper South Fork John Day River	94,644	Temperature		41
Middle South Fork John Day River	121,727	Temperature		224
Murderers Creek	84,940	Temperature		1,202
Upper John Day River	106,714	Temperature	137	
Strawberry Creek	149,722	Temperature	2,609	12
Beech Creek	70,873	Temperature	617	1,800
Laycock Creek	108,251	Temperature		1,428
Fields Creek	110,890	Temperature		205
North Fork John Day Subbasin				
Upper North Fork John Day River	71,464	Temperature		167
North Fork John Day River/Big Creek	105,870	Temperature		4,064
Upper Camas Creek	104,688	Temperature		959

Table 32. Watersheds with Water Quality Impaired Stream Segments (continued)

Watershed Name	Total Acres	303d Listing Criteria	Exchange Acres	
			To Convey	To Acquire
Lower Camas Creek	156,989	Temperature	1,925	152
North Fork John Day River/Potamus Creek	185,282	Temperature	181	159
Wall Creek	128,349	Temperature Sediment		2,246
Cottonwood Creek	149,078	Biologic Criteria	152	160
Lower North Fork John Day River	117,028	Temperature	2,389	405
Middle Fork John Day Subbasin				
Upper Middle Fork John Day River	78,277	Temperature		514
Camp Creek	125,884	Temperature		112
Big Creek	111,556	Temperature		441
Long Creek	130,497	Temperature		163
Lower John Day River/Kahler Creek	197,997	Temperature		156

Water Rights

The objective of this section is to describe effects of the Proposed Land Exchange on water developments and water rights located on acquired and conveyed lands. The analysis area for water rights includes the parcels with water developments, plus adjacent lands with related water development facilities and places of use. For cumulative effects, the analysis area includes the watershed of the main stem stream above the furthest downstream water right. The time period for evaluation of effects on water resources is the next 10 years.

This section summarizes information for all known water developments and water rights on parcels included in the Proposed Land Exchange. Water rights and developments affect 81 Federal and non-Federal parcels. Data and analysis was summarized, consolidated or referenced in the PR to assure that descriptions are no longer than necessary to understand the effects of the alternatives (40CRR 1502.15). Water rights information (permits, certificates, maps) has been provided by the Blue Mountain Lands Zone. Additional water rights information was obtained from the Grant, Umatilla, and Wallowa County watermasters and from the Oregon Water Resources Department (OWRD) website. PR documents were also updated with information on water developments without water rights; this information was obtained through aerial photo interpretation, interviews with landowners and land managers, and site inspections. The high priority site inspections were water developments on parcels with irrigation, mining, or domestic water rights, plus water developments without water rights. Most ponds listed in recent water rights and exempt reservoir notices for stockwater or wildlife use were rated low priority for site inspections; exceptions were water rights with legal description problems.

Case files were made for all of the known water rights and water developments. These case files included photocopies of water rights certificates or permits, water right maps, water right plat cards, livestock allotment records, aerial photos, topographic maps, and parcel maps. As

fieldwork progressed, field note reference numbers were added to water right numbers, case file numbers, and parcel numbers for every water right or water development on the Preliminary Water Rights Evaluation list. This information is available for review in the PR.

Laws and Regulations Applying to the Analysis

The Blue Mountain Land Exchange Water Rights Existing Condition Report located in the PR lists quotes from Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR), FS Manual, and Forest Plans relevant to water rights decisions that should be made for the Proposed Land Exchange. The recommended actions are:

Necessary Administrative Actions:

- Submit affidavits to OWRD requesting correction of decrees and certificates with point of diversion or place of use errors.
- Submit water right applications for all unauthorized developments if needed for FS purposes.
- Decommission unsafe domestic water supply sources.
- Where possible water rights acquired by the US will be leased to the State for instream use.
- Complete and submit ownership update forms to OWRD.

Affected Environment

Table 33 identifies the 81 parcels in the Proposed Land Exchange with water developments and/or water rights for acquired and conveyed parcels by forest. Detailed information on water developments and water rights in these parcels is available in the PR.

Table 33. Offered and Conveyed Parcels with Water Developments and/or Water Rights by Forest

National Forest	Parcels	Number of Parcels
Malheur – conveyed lands	FM2, FM9, FM10, FM15, FM16A, FM17, FM18, FM19, FM21	9
Malheur – acquired lands	PM2, PM4, PM5, PM7, PM30	5
Umatilla – conveyed lands	FU3A, FU3C, FU3D, FU21, FU30	5
Umatillla – acquired lands	PU1A, PU1B, PU5, PU7B, PU7C, PU9A, PU11B, PU15, PU16C, PU16E, PU16H, PU19, PU20, PU22A	14
Wallowa-Whitman – conveyed lands	FW1D, FW6A, FW17C	3

Table 33. Offered and Conveyed Parcels with Water Developments and/or Water Rights by Forest (continued)

National Forest	Parcels	Number of Parcels
Wallowa-Whitman – acquired lands	PW3, PW7B, PW7C, PW8A, PW8B, PW8C, PW10B, PW11, PW12, PW13D, PW14, PW15A, PW15B, PW16C, PW16D, PW19B, PW20B, PW20C, PW21C, PW21D, PW23B, PW24A, PW24C, PW24D, PW24E, PW24H, PW25B, PW25C, PW25D, PW25E, PW27C, PW30, PW33, PW34A, PW34B, PW34C, PW38, PW39A, PW39B, PW39C, PW40, PW48, PW50, PW51A, PW52	45
	Total Number of Parcels	**81**

Water Related Safety

The dams/reservoirs for stockwater purposes are not large enough to require safety inspections by OWDR personnel or by FS engineers.

Environmental Consequences

The effects of alternatives on all water developments, water uses, and water rights known to exist on lands appurtenant to the analysis are discussed. This discussion is centered on legal, environmental, and economic issues associated with water rights.

Specific information compiled and located in the PR for each water development, water use, and water right known to exist for each alternative includes:

- **Type of Water Development:** well, reservoir, spring diversion, stream diversion.
- **Water Use or Purpose:** domestic or human consumption, irrigation, mining, stock, stock/wildlife, wildlife, railroad, fire protection, and instream (fish and aquatic life).
- **Type of Water Use Authorization:** water right certificate, water use permit, statutory exempt uses, none, Federal reserved water rights.
- **Status of Water Use:** Used in past 5 years, not used in past 5 years.
- **Implementation Cost:** field inventory (FS, Clearwater), new surface water applications, new reservoir applications, beneficial use reports, correction of water use authorizations, affidavits of cancellation, ownership updates, annual water use reports, water development decommissioning, water development maintenance.

Effects Common to all Action Alternatives

All parties to a land exchange/purchase would need to submit water right ownership update forms to OWRD. The “Water Right Ownership Update” form must be used for certificates and the “Request for Assignment” form must be used for permits.

All governmental entities would need to review and update the list of water rights appurtenant to their annual water use reports and ensure that detailed water use reporting would be done for all diversions of at least 0.1 cubic feet per second (CFS) pursuant to instructions in OAR 690-85.

All functioning water developments would continue to function. Maintenance needed to keep them functional would vary.

Federal reserved water rights cannot be transferred to acquired lands.

Alternative 1: Proposed Exchange

Under this alternative, the FS would acquire 64 parcels with water developments and/or water rights and would convey 17 parcels with water developments and/or water rights. For specific information on each parcel refer to tables in the PR.

A direct effect would be that all of the water developments and water rights appurtenant to parcels subject to exchange under Alternative 1 would pass to the new landowners, regardless of status with respect to state water law.

The indirect effects related to legal issues are summarized in six categories.

1) *Errors on water right certificates and/or maps.* Alternative 1 would have 9 identified errors.
2) *Water rights in non-use status for more than 5 years.* These rights are subject to rebuttable presumption of forfeiture under state law (ORS 540.610). This alternative would have 20 certificates on acquired land and 1 certificate on conveyed land where water rights may have been in non-use status.
3) *Unauthorized water uses.* These uses would need to be resolved by either obtaining water right permits and/or providing proof of beneficial use, or by decommissioning the water developments. Alternative 1 would have 17 unauthorized reservoirs on acquired lands and 20 unauthorized reservoirs on conveyed lands, which are used primarily for stockwater and wildlife purposes. There would also be 3 unauthorized domestic spring developments, one each in PW33, PW34A, and PW48. The development in PW34A services a private residence that would likely be dropped from the proposed exchange.
4) *Determination of exempt water use status.* Certain water developments have been or still need to be inspected to ensure they qualify or can be modified to qualify as exempt water uses. Three types of exempt water developments would exist on Alternative 1 exchange parcels: wells, reservoirs, and spring developments. There is one exempt domestic well located on Parcel PW39B. It will likely be dropped from the exchange. There is one exempt reservoir located on Parcel PU1B. Some reservoirs that only tap ground water, identified under unauthorized water uses, may also qualify as exempt groundwater developments. There would be 4 springs on conveyed lands and 7 springs on acquired lands, which may qualify as exempt stockwater sources. Most of these developments still need to be inspected to confirm qualification as exempt.
5) *Ownership update following exchange of lands.* Following the proposed exchange, ownership updates would be submitted to OWRD for all lands included on 23 water right certificates and 3 water right permits. Ownership updates would also be needed for up to 18 new water right applications, which may be submitted before completion of the proposed exchange, unless the entity to receive the parcel would be listed as the applicant.

6) *Water use reporting.* Following the exchange, the FS would also be required by state law to report water use annually for any water rights obtained under state law. Rights that would require this are listed in the PR. When ownership updates are submitted to OWRD, that information would be used by OWRD to update the draft annual water use reports for the Malheur, Umatilla and Wallowa-Whitman National Forests. The draft reports should be carefully inspected to ensure the proper land exchange-related additions and deletions are made.

In addition to the above, it is noted that the FS for any Federal parcel subject to exchange has not quantified Federal reserved water rights; neither has the State of Oregon adjudicated any Federal reserved water rights for any Federal lands subject to the Proposed Land Exchange.

Federal reserved water rights that may be appurtenant to any single Federal parcel with reserved status are (USFS 1990):

- Water needed for fire protection and control.
- Water needed for constructing and maintaining access roads for timber production and watershed protection activities.
- Water needed for irrigation of tree nurseries, seed orchards, and other facilities devoted primarily to the supply of timber or watershed protection.
- Water needed for maintaining FS riding and packstock used in the administration of the NFS timber resources and for watershed protection.
- Water needed in connection with special uses where the user is engaged in activities carried out for watershed protection or timber production on the NFS lands.
- Water needed in the form of instream flows sufficient to maintain the stability of stream channels for favorable conditions of waterflow and protection against the loss of productive timber lands adjacent to the stream channels.

Any of the above-listed reserved water rights that may exist on Federal parcels subject to the proposed exchange would become void upon conveyance of NFS lands to private ownership. No Federal reserved water rights would be received from or for acquired lands. However, the State of Oregon has not recognized Federal reserved water rights on any of the Federal lands proposed for conveyance in this exchange.

The indirect effects related to environmental issues are summarized in five categories.

Some of these issues may be resolved before or after the proposed exchange of lands, while other issues would not be resolved at all.

1) *Unsafe domestic water sources.* Alternative 1 would have an unsafe domestic water development on acquired lands. It is an above ground domestic water development located on a large spring in Parcel PW48 has better water quality and may be suitable for human consumption with treatment. However, this source also would not be needed for National Forest purposes nor be used for human consumption. Domestic water developments in three other parcels (PU9A, PW7, and PW25D) no longer exist.
2) *Potential for private landowners to successfully reestablish apparently abandoned water uses if lands are not exchanged and water rights are not cancelled.* In

Alternative 1 part or all of 20 water rights on acquired lands and 1 water right on conveyed land have been in non-use status for more than 5 years. Most of these water uses have been abandoned for at least 20-40 years. When a water right is not used for more than 5 years, it is subject to a rebuttable presumption of forfeiture [ORS 540.610(1)]. This law allows a landowner to overcome the presumption of forfeiture after successfully using an abandoned right for 15 years [ORS 540.610(2)(f)].

3) *The effects of exercise of consumptive water developments and rights on streamflows in OWRD Water Availability Basins (WABs).* The potential effects of exercise of consumptive water developments and rights on streamflows in OWRD WABs are documented in the PR. The effects would be more severe in the fall than in the spring due to lower streamflow. Streams under Alternative 1 that would have at least a 5% reduction in streamflow at some time of the year are: Big Sheep Creek, Horse Creek, Corral Creek, Dodson Creek, Thorn Creek, Tully Creek, Cow Creek, Joseph Creek, Doe Creek, Chesnimnus Creek, Meacham Creek, Idaho Creek, Olmstead Creek, Deadwood Creek, Swamp Gulch, Big Creek, Deep Creek, Middle Fork John Day River and Deer Creek. Of the developments and rights that would affect at least 10% of streamflow, all may have been abandoned except Permit S-49249 for irrigation from Joseph Creek and the domestic development on Doe Creek.
4) *ODFW instream water rights are also listed for comparison with the modeled flow reductions.* Only three streams would be affected by modeled flow reductions of 5% or more: Joseph Creek, Meacham Creek, and Middle Fork John Day River. Joseph Creek is the only stream that would have a streamflow increase if the water right were cancelled; water uses on the other streams appear to have been abandoned.
5) *Effect of storage on stream channels, streamflow, wetlands, livestock, and wildlife.* The effect of storage and spring developments on stream channels, streamflow, and wetlands is localized. Reservoirs increase local water loss due to evaporation from larger water surfaces. Reservoirs capture streamflow, thereby reducing local downstream flow. Construction of reservoirs destroys natural wetlands along streams, but new wetlands develop around reservoirs if the water level is relatively stable and livestock/wildlife use is low. Spring developments have a lower impact on streamflow if they are developed with return flow to the natural channel near the point of diversion. However, livestock and wildlife usually damage riparian areas around spring areas if the source areas are not fenced and troughs are not located outside of wetlands. All of the above conditions were observed in Alternative 1 affected parcels, but no consistent inventory of such conditions was made.

Costs would be incurred to address the legal and environmental issues previously discussed. Table 34 displays costs associated with water rights and uses.

Table 34. Alternative 1- Estimated Costs for Private and FS

Cost Item	Cost for Acquired Lands	Cost for Conveyed Lands	Total Costs[3]
Correct errors	$540	$60	$600
Obtain new water rights	$5,840	$3,060	$8,900
Decommission developments[1]	$2,360	$0	$2,360
Maintain/use developments[2]	$1,660/yr	$1,020/yr	$2,680/yr
Update ownership	$900	$420	$1,320
Report water use	$60	$0	$60
Total Costs[3]	$9,700 + $1,660/yr	$3,540 + $1,020/yr	$13,240 + $2,680/yr

1) This does not include decommissioning costs for any water develops for which OWRD would deny a water right application.
2) This does not include the cost of maintaining irrigation use for Permit S-49249 on Joseph Creek, the cost of proving up on the permit, or the cost of transferring this or any other valid water rights to temporary instream use to maintain those rights.
3) Costs were modeled for $30/hour.

Cumulative effects are associated with legal, environmental, and economic issues discussed under indirect effects.

All of the water developments and/or water rights previously discussed would require between 1 and 6 individual actions to bring them into compliance with state water law. About 315 individual actions have been identified. The economic cost of these actions is displayed in Table 34. Total modeled costs for private and FS would be about $13,240 plus $2,680/yr. The actual or potential environmental effect of implementing the Proposed Land Exchange discussed and documented in the PR would reverse most of the effects on streamflow where exercise of the water rights would divert at least 5% of streamflow.

Alternative 1 Summary

Water developments and water rights have the potential to conflict with FS management objectives and policies of other jurisdictions. The exercise of valid water rights, (more specifically, stream diversions for irrigation), could adversely affect listed fish species. The affected fish species include spring/fall Chinook salmon, summer steelhead and bull trout. The State of Oregon water laws have been discussed under indirect effects of legal issues. The exercise of valid water rights may adversely affect water quality of streams on the ODEQ 303(d) List. Tribal Governments cite from the *Spirit of the Salmon* (CRITFC 1995) when referring to water quality. A Problem Statement in this document states “Inadequate instream flows and sometimes the complete absence of water due to irrigation withdrawals have severely affected Columbia basin salmon”. Recommended actions related to water quality include: Halt any additional consumptive withdrawals of water…until adequate instream flows…are protected; Assure that no consumptive uses are occurring in excess of the amount permitted; Halt any further impairments of wetlands; and Establish instream flows designed to provide a full range of habitat conditions…

Probable adverse effects of exercise of water rights through use of currently functioning water developments include reduced streamflow of affected waters, plus related indirect adverse effects

on riparian areas, aquatic life, water quality, riparian-dependent wildlife, floodplains, and soil productivity. Another potential adverse effect is impairment of fish passage at diversion structures; however, no such structures are known to exist on exchange lands. The only water rights that could potentially impair passage at this time are Parcels PW34A and PW34B on Joseph Creek and the Parcel PW24A on Big Sheep Creek. PW34A would likely be dropped from the exchange. The water right on Joseph Creek is for placement of a pump in the Creek, so no structure would impair passage. The water right on Big Sheep Creek is too small to adversely affect passage.

Probable beneficial effects of exercise of water rights include late season water supply in reservoirs for wildlife and livestock, wetland creation by reservoirs, peak streamflow reduction by and sediment storage in reservoirs, off-channel water supply provided by upland spring developments, and cold water return flows from irrigated areas adjacent to streams.

Irretrievable commitment of resources refers to opportunity foregone by a particular choice of resource use. Diversion and consumptive use of water represents an irretrievable commitment of water resources to out-of-stream uses during the time water is diverted. Storage represents an irretrievable commitment because water loss by evaporation from an open water surface is higher than water loss by evapo-transpiration from soil and plants. Instream use is retrievable when water rights are not exercised (and related facilities are decommissioned) or are temporary transferred to instream use.

All three Forest Plans require compliance with state water rights laws.

If Alternative 1 is implemented following the proposed exchange, compliance with Forest Plan direction requires each Forest to:

- Request that OWRD add newly acquired water rights to the Forest's Annual Water Use Report, and delete the water rights conveyed.
- Inspect and modify newly acquired water developments as needed to ensure they are developed in accordance with the terms and conditions in the water right permit or certificate.
- Acquire water rights for unauthorized water developments or decommission those developments.
- Correct inaccuracies on water rights permits or certificates.
- Use water at least one year in 5 to avoid forfeiture or inform OWRD that water use has been abandoned.
- Cooperate with OWRD in investigations of abandoned water uses.

Alternative 2: No Action

Under this alternative, no water developments and/or water rights would be acquired or conveyed.

It is likely that most of the actions recommended resolving the legal and environmental issues discussed as indirect effects for Alternative 1 would remain unresolved for considered exchange parcels during the next 10 years. For example it is likely that irrigation water use would continue on Joseph Creek. Potentially abandoned water rights on private lands documented in the PR could be reactivated. However, it is likely that the FS would eventually accomplish the recommended

actions for unauthorized water developments, if those developments do not already qualify as reserved water rights.

In summary, it is likely there would be little resolution by the FS and private landowners of legal and environmental issues discussed previously under indirect and cumulative effects.

Alternative 3: Purchase

Under this alternative, the FS would purchase 16 parcels with water developments and/or water rights and would convey no parcels.

A direct effect would be that all of the water developments and water rights appurtenant to parcels subject to purchase under Alternative 3 would pass to the FS, regardless of status with respect to state water law.

The indirect effects relate to legal issues are summarized in six categories.

1) *Errors on water right certificates and/or maps.* Alternative 3 would have 1 identified error.

2) *Water rights in apparent non-use status for more than 5 years.* This alternative would have part or all of 9 certificates on purchased land.

3) *Unauthorized water uses.* These uses need to be resolved by obtaining water right permits and providing proof of beneficial use, or by decommissioning the water developments. This alternative would have 3 unauthorized reservoirs on purchased lands and 2 unauthorized domestic spring developments, one each in PW34A, and PW48. PW34A is likely to be dropped from the exchange

4) *Determination of exempt water use status.* Two types of exempt water developments exist on Alternative 3 purchased parcels: reservoirs, and spring developments. Some reservoirs that only tap ground water, identified under unauthorized water uses, may also qualify as exempt groundwater developments. There would be 2 springs on purchased lands, which may qualify as exempt stockwater sources.

5) *Ownership update following purchase of lands.* Following the purchase, ownership updates must be submitted to OWRD for one water right certificate. Ownership updates would also be needed for up to 3 new water right applications.

6) *Water use reporting.* Following the purchase, the FS would also be required by state law to report water use annually for any water rights obtained under state law.

No reserved water rights would be conveyed under Alternative 3.

The indirect effects relate to environmental issues are summarized in four categories.

Some of these issues may be resolved before or after purchase of lands, while other issues would not be resolved at all. These issues are the same as identified under Alternative 1.

1) *Unsafe domestic water sources.* Alternative 3 would have one unsafe domestic water development on purchased lands. It is an unfenced aboveground domestic water development on a large spring in Parcel PW48. It may be suitable for human

consumption with treatment. However, this source would not be needed for National Forest purposes nor used for human consumption. A domestic water development in one other parcel (PW25D) no longer exists.

2) *Potential for private landowners to successfully reestablish apparently abandoned water uses if lands are not purchased.* In Alternative 3 part or all of 9 water rights on purchased lands may have been in non-use status for more than 5 years. When a water right is not used for more than 5 years, it is subject to a rebuttable presumption of forfeiture [ORS 540.610(1)]. This law allows a landowner to overcome the presumption of forfeiture after successfully using an abandoned right for 15 years [ORS 540.610(2)(f)].

3) *The effects of exercise of consumptive water developments and rights on streamflows in OWRD Water Availability Basins (WABs).* The potential effects of exercise of consumptive water developments and rights on streamflows in OWRD Water Availability Basins (WABs) are documented in the PR. The effects would be more severe in the fall than in the spring due to lower streamflow. The stream under Alternative 3 that would have at least a 5% reduction in streamflow at some time of the year would be Horse Creek. The water right for this source may have been abandoned.

   ODFW instream water rights are also listed for comparison with the modeled flow reductions. None of them would be affected by modeled flow reductions of 5% or more.

4) *Effect of storage on stream channels, streamflow, wetlands, livestock, and wildlife.* This effect is localized as discussed under Alternative 1.

Costs would be incurred to address the legal and environmental issues previously discussed under this alternative. Table 35 displays costs associated with water rights and uses.

Table 35. Alternative 3- Estimated Costs for FS

Cost Item	Cost for Acquired Lands	Cost for Conveyed Lands	Total Costs[3]
Correct errors	$60	na	$60
Obtain new water rights	$950	na	$950
Decommission developments[1]	$0	na	$0
Maintain/use developments[2]	$320/yr	na	$320/yr
Update ownership	$60	na	$60
Report water use	$30	na	$30
Total Costs[3] Details in PR	$1,360 + $320/yr	na	$1,360 + $320/yr

1) This does not include decommissioning costs for any water develops for which OWRD would deny a water right application.
2) This does not include the cost of maintaining irrigation use for Permit S-49249 on Joseph Creek, the cost of proving up on the permit, or the cost of transferring this or any other valid water rights to temporary instream use to maintain those rights
3) Costs were modeled for $30/hour.

Cumulative effects are associated with legal, environmental and economic issues discussed under indirect effects.

Every one of the water developments and/or water rights appurtenant to Alternative 3 would require between 1 and 6 individual actions to bring them into compliance with state water law.

About 32 individual actions have been identified. The economic cost of these actions is displayed in Table 35. Total modeled costs for private and FS would be about $1,360 plus $320/yr. The actual or potential environmental effect of implementing the actions discussed and documented in the PR would reverse most of the effects on streamflow where exercise of the water rights would divert at least 5% of streamflow.

This alternative's summary statement is the same as Alternative 1.

Alternative 4: Deed Restriction

Under this alternative, the FS would acquire 40 parcels with water developments and/or water rights and would convey 17 parcels with water developments and/or water rights. For specific information on each parcel refer to tables in the PR.

A direct effect would be that all of the water developments and water rights appurtenant to parcels subject to exchange under Alternative 4 would pass to the new landowners, regardless of status with respect to state water law.

The indirect effects relate to legal issues are summarized in six categories.

1) *Errors on water right certificates and/or maps.* Alternative 4 would have 5 identified errors on water right certificates and/or related maps.

2) *Water rights in apparent non-use status for more than 5 years.* This alternative would have 16 certificates on acquired land and 1 certificate on conveyed land that should be cancelled.

3) *Unauthorized water uses.* Alternative 4 would have 14 unauthorized reservoirs on acquired lands and 20 unauthorized reservoirs on conveyed lands, which are used primarily for stockwater and wildlife purposes. There would also be 2 unauthorized domestic spring developments, one each in PW34A and PW48. PW34A is likely to be dropped from the exchange.

4) *Determination of exempt water use status.* Certain water developments have been or still need to be inspected to ensure they qualify or can be modified to qualify as exempt water uses. Two types of exempt water developments would exist on Alternative 4 exchange parcels: reservoirs, and spring developments. Some reservoirs that only tap ground water, identified under unauthorized water uses, may also qualify as exempt groundwater developments. There would be 4 springs on conveyed lands and 6 springs on acquired lands, which may qualify as exempt stockwater sources. Most of these developments still need to be inspected to confirm qualification as exempt.

5) *Ownership update following exchange of lands.* Following this alternative, ownership updates would be submitted to OWRD for all lands included on 9 water right certificates and 1 water right permit. Ownership updates would also be needed for up to 14 new water right applications, which may be submitted before completion of this Exchange Alternative unless the entity to receive the parcel would be listed as the applicant.

6) *Water use reporting.* Following this alternative, the FS would also be required by state law to report water use annually for any water rights obtained under state law. Rights that would require this are listed in the PR.

The situation with respect to reserved water rights would be the same as described under Alternative 1.

The indirect effects relate to environmental issues are summarized in four categories.

Some of these issues may be resolved before or after exchange of lands, while other issues would not be resolved at all.

1) *Unsafe domestic water sources.* Alternative 4 would have one unsafe domestic water developments on acquired lands. It is an unfenced aboveground domestic water development located on a large spring in Parcel PW48. It may be suitable for human consumption with treatment. However, this source would not be needed for National Forest purposes nor be used for human consumption. Domestic water developments in three other parcels (PU9A, PW7, and PW25D) no longer exist.

2) *Potential for private landowners to successfully reestablish apparently abandoned water uses if lands are not exchanged.* In Alternative 4 part or all of 16 water rights on acquired lands and 1 water right on conveyed land have been in non-use status for more than 5 years. When a water right is not used for more than 5 years, it is subject to a rebuttable presumption of forfeiture [ORS 540.610(1)]. This law allows a landowner to overcome the presumption of forfeiture after successfully using an abandoned right for 15 years [ORS 540.610(2)(f)].

3) *The effects of exercise of consumptive water developments and rights on streamflows in OWRD Water Availability Basins (WABs).* The potential effects of exercise of consumptive water developments and rights on streamflows in OWRD Water Availability Basins (WABs) are documented in the PR. The effects would be more severe in the fall than in the spring due to lower streamflow. Streams under Alternative 4 that would have at least a 5% reduction in streamflow at some time of the year would be: Big Sheep Creek, Horse Creek, Corral Creek, Dodson Creek, Thorn Creek, Tully Creek, Cow Creek, Joseph Creek, Meacham Creek, Idaho Creek, Olmstead Creek, Deadwood Creek, Swamp Gulch, Big Creek, Deep Creek, Middle Fork John Day River and Deer Creek. Of the developments and rights that would affect at least 10% of streamflow, all have apparently been abandoned except Permit S-49249 for irrigation from Joseph Creek.

   ODFW instream water rights are also listed for comparison with the modeled flow reductions. Only three streams would be affected by modeled flow reductions of 5% or more: Joseph Creek, Meacham Creek, and Middle Fork John Day River. Water uses on these streams appear to have been abandoned, so transfer of water rights to the FS would merely protect an existing condition of restored streamflow.

4) *Effect of storage on stream channels, streamflow, wetlands, livestock, and wildlife.* This effect is localized as discussed under Alternative 1.

Costs would be incurred to address the legal and environmental issues previously discussed under Alternative 4. Table 36 displays costs associated with water rights and uses.

Table 36. Alternative 4- Estimated Costs for Private and FS

Cost Item	Cost for Acquired Lands	Cost for Conveyed Lands	Total Costs[3]
Correct errors	$240	$60	$300
Obtain new water rights	$3,160	$3,060	$6,220
Decommission developments[1]	$1,500	$0	$1,500
Maintain/use developments[2]	$420/yr	$1,020/yr	$1,440/yr
Update ownership	$180	$420	$600
Report water use	$60	$0	$60
Total Costs[3]	$5,140 + $420/yr	$3,540 + $1,020/yr	$8,680 + $1,440/yr

1) This does not include decommissioning costs for any water develops for which OWRD would deny a water right application.
2) This does not include the cost of maintaining irrigation use for Permit S-49249 on Joseph Creek, the cost of proving up on the permit, or the cost of transferring this or any other valid water rights to temporary instream use to maintain those rights.
3) Costs were modeled for $30/hour.

Cumulative effects are associated with legal, environmental and economic issues discussed under indirect effects.

All of the water developments and/or water rights appurtenant to Alternative 4 would require between 1 and 6 individual actions to bring them into compliance with state water law before and/or after lands would be conveyed and acquired. About 156 individual actions have been identified. The economic cost of these actions is displayed in Table 36. Total modeled costs for private and FS would be about $8,680 plus $1,440/yr. The actual or potential environmental effect of implementing the actions discussed and documented in the PR would reverse most of the effects on streamflow where exercise of the water rights would divert at least 5% of streamflow.

This alternative's summary statement is the same as Alternative 1.

Vegetation

The objective of this section is to describe current conditions of upland forest vegetation. Late and old structure (LOS) will be compared to historic LOS conditions by watersheds that contain LOS and/or Forest Plan dedicated old growth. The gain or loss from historic conditions of LOS and old growth will be disclosed by alternatives evaluated in detail. The analysis area includes portions of the Wallowa-Whitman, Malheur, and Umatilla National Forests and 49 fifth level HUC watersheds on these forests. Federal and non-Federal land information in the Affected Environment and Environmental Effects subsection of this section are organized by National Forest. Forest vegetation on Proposed Land Exchange parcels covers approximately 19,136 acres of non-Federal land and 13,239 acres of Federal land. Other vegetative types such as grasslands and shrub lands will not be addressed in this section.

Two forest vegetation characteristics commonly used to describe forest conditions are potential vegetation and stand structure. Potential vegetation groups (PVG) are an aggregation of plant association groups having similar environmental regimes and dominated by similar plant types (Powell 2000). Potential vegetation of a particular site reflects that site's biophysical environment, including temperature/moisture regime and soil characteristics. Potential vegetation is useful in structural stage analysis because all forest types (i.e., dry, moist, cold) do not occupy

every structural stage, and different forest types do not spend an equal amount of time in any particular structural stage.

Structural stage classes exhibit recognizable conditions that relate to the physical orientation and arrangement of vegetation, the size and arrangement (vertical and horizontal) of trees and tree parts (Powell 2000). Structural stages reflect the natural successional development of a forest ecosystem following disturbance. Structural stage classification is useful in characterizing the physical attributes of a forest stand (i.e., late and old structure).

Analysis of forest vegetation requires a landscape-level assessment of vegetation conditions, including an analysis of the historical range of variability (HRV). Historic range of variability is a characterization of the fluctuations in ecosystem conditions or processes over time; and is used as an analytical technique to define the bounds of consistent ecosystem behavior over time (Powell). As with other large scale analyses of ecosystem conditions, "historical" in this DEIS is intended to represent conditions and processes that are likely to have occurred prior to settlement of the project area by people of European decent, approximately the mid-1800s (Interior Columbia Basin Ecosystem Management Project). An HRV analysis compares the current forest structure distribution of a potential vegetation group to an estimated historic distribution. The historic distribution estimates are described as a range of percentages for specific structural stages. A mid-point percentage is sometimes used during analysis, rather than a range. The results of an HRV analysis are generally summarized in a table showing the current percentages and the historic range, or mid-point average, for each structural stage. For purposes of comparison to the current conditions, historical conditions referenced in this DEIS represent an estimated mid-point with the historic range of variability. Comparison to a historic midpoint is sufficient in this analysis because its use is limited to a reference point for comparison and not as a decision making factor.

Assessments of historic range of variability have been completed at the 5th field watershed scale for all watersheds of the Wallowa-Whitman and Umatilla National Forests, and for the Lower North Fork John Day River watershed of the Malheur National Forest. Previous HRV analysis for watersheds on the Wallowa-Whitman NF combined several mid-seral structural stages (stem exclusion, understory reinitiation, and multi-strata without large tree), into one "mid" category, and combined the two late seral stages (multi-strata and single-strata with large trees) into one "late" category. As a result, the historic mid-point of each stage was combined to form one average mid-point for the "mid" and "late" categories. HRV analysis in this DEIS is confined to the "late" category to account for effects to late and old structure. For consistency across the three National Forests, HRV analysis tables in this report will display only the average of historic mid-points of multi-strata and single-strata LOS. The current LOS conditions only consider NFS land, since structure stage data on other ownership is not available.

The Wallowa-Whitman and Umatilla National Forests assign different structural tags, or identifiers, to LOS on their respective forests. The Wallowa-Whitman National Forest identifies multi-strata with large trees (MSLT) and single strata with large trees (SSLT) as the two structural stages associated with LOS. The Umatilla National Forest identifies old forest multi-strata (OFMS) and old forest single strata (OFSS) as the two structural stages associated with LOS. The structural characteristics of MSLT and OFMS are the same, just identified differently. Likewise, the structural characteristics of SSLT and OFSS are the same. LOS on the Malheur National Forest is identified as MSLT and SSLT, the same as the Wallowa-Whitman National Forest.

Structural stages are sometimes combined and simply referred to as early, mid, and late. Late and old structure corresponds to “late”. Stand initiation structure corresponds to “early”. The remaining structures correspond to mid-structures are simply a catchall category between very young stands (stand initiation) and mature forests (LOS). It is a very broad category in terms of age, numbers and size of trees. That is why over 83% of the parcels to acquire and 76% of the parcels to convey are classified as mid-structure. The tables in this section display structural stages as early, mid, and late. The tables containing specific parcel information display structural stages as identified for that particular National Forest.

The Proposed Land Exchange includes several parcels with forested acres of LOS and Forest Plan dedicated old growth. All of the three Forests in the project area have dedicated old growth. Dedicated old growth is specific management areas set aside in the Forest Plans to insure that proposed management activities promote retention of old growth values. These areas are intended to maintain habitat diversity, preserve aesthetic values, and to provide old growth habitat for wildlife. Conveyance of Forest Plan dedicated old growth requires an amendment of the Forest Plan. In most instances, dedicated old growth is composed of forested stands containing late and old structure. LOS, by contrast, is any stand, regardless of Forest Plan management area designation, containing late and old forest structure. In general, old growth has LOS, but LOS is not necessarily dedicated old growth.

Several noted trends in the three forests within the analysis area have occurred due to departures from native disturbance and successional processes since historic times. These broad-scale changes in forest health conditions have influenced the susceptibility of the forests to uncharacteristic wildfires and large-scale insect and disease events, and have affected habitat for many wildlife species. These trends include loss of the large-tree component within roaded and harvested areas, loss of single-strata and old structure (LOS) in the dry forest type, and an increase in mid-seral structures in the dry and moist forest types (ICBEMP). The loss of LOS is a concern because of its effect on forest health. Forest health is defined as the condition in which forest ecosystems sustain their complexity, diversity, resilience, and productivity while providing human needs (ICBEMP). Resiliency enables a forest to persist during change, thereby allowing its complexity, diversity, and productivity to be sustained. Forests that are within their historic range of variability are more resilient. Therefore, it is desirable to move forests toward this historic range of variability (HRV) across the landscape.

Affected Environment

Vegetation Groups and Structural Stages

Ecoclass information from the GIS database of each of the three National Forests was used to determine forested acres, potential vegetation, and stand structure for NFS land. Walk-through stand exams and aerial photo interpretation was used to determine forested acres, potential vegetation, and stand structure for private land parcels.

The following general descriptions of the cold, moist, and dry potential vegetation groups of the Blue Mountains apply to both NFS land and private land.

Cold upland forests
These forests generally occur in subalpine environments at elevations ranging from 4,000 feet to over 8,000 feet. The dominant plant associations vary depending upon landform. The subalpine fir/big huckleberry plant association dominates where cold air drainage occurs. The subalpine

fir/grouse huckleberry and lodgepole pine/grouse huckleberry associations occur where cold, moist conditions are maintained through prolonged frost and snow covered periods. Lodgepole pine and western larch are the early pioneers following disturbances. Over-abundant regeneration of lodgepole pine results in stagnation at an early stage, a condition that continues throughout the life of the stand until another disturbance occurs. Without disturbance, subalpine fir and Engelmann spruce successionally replace lodgepole pine.

Moist upland forests
These forests are generally mixed-conifer, multi-strata, and uneven-aged, occurring at elevations ranging from 3,500 feet to over 6,400 feet. The dominant plant associations vary depending upon landform. On cool/dry sites, the grand fir/twinflower plant association dominates plateaus and lower slopes, while the grand fir/big huckleberry association dominates on mid to upper slopes. The lodgepole pine/sitka alder plant association dominates cool/moist sites. The early seral species, Douglas-fir, western larch, and lodgepole pine currently occur primarily as remnant overstory. Grand fir, and Engelmann spruce on moister sites, follow successionally, and currently dominate the understory.

Stand replacement wildfires are uncommon, and most stands are in an uneven-aged, multi-strata condition. However, eighty years of effective fire suppression has altered historic fire regimes, allowing fire intolerant grand fir to become overly dense. Increased stand density has resulted in declining tree vigor and increased tree mortality; leading to higher fuel levels. Increased fuel abundance has increased the occurrence of historically rare crown fires. In addition, decreasing tree vigor and replacement of early seral species with a preferred pathogen host, grand fir, has led to increases in insects and disease over historic levels. The over-abundance of grand fir has contributed to increased incidence of fir engraver beetle and spruce budworm, and the expansion of armillaria and annosus root diseases.

Dry upland forests
These forests generally occur at elevations ranging from 3,500 to 6,000 feet, with the Douglas-fir/snowberry plant association dominating. Eighty years of effective fire suppression have altered historic fire regimes. The absence of fire and intensive harvest of large early seral species, has converted ponderosa pine dominated stands to overly dense stands of understory Douglas-fir. Increased stand density has resulted in declining tree vigor and increased tree mortality; leading to higher fuel levels. Increased fuel abundance has increased the occurrence of historically rare crown fires. Replacement of early seral species with a preferred pathogen host, Douglas-fir, has led to increases in insects and disease over historic levels. An over abundance of Douglas fir has contributed to increased incidence of mountain pine and Douglas-fir bark beetles, and expansion of armillaria and annosus root diseases.

The Federal parcel distribution of forested acres by structural stage for each potential vegetation group in the proposed exchange within each of the three forests is described below and summarized in Table 37. The PR has the Upland Forest Vegetation information on forested acres, potential vegetation, and structure stage distribution by specific exchange parcel.

Table 37. FS Land Structure Stage Distribution by Potential Vegetation Group

National Forest	Potential Vegetation	Structural Stage Distribution					
		Early		Mid		Late	
		Acres	Percent	Acres	Percent	Acres	Percent
Wallowa-Whitman	Cold UF	18	2	772	90	64	8
	Moist UF	-0-	-0-	49	100	-0-	-0-
	Dry UF	133	8	1,121	68	403	24
	Total	**151**	**-**	**1,942**	**-**	**467**	**-**
Umatilla	Cold UF	52	69	18	24	5	7
	Moist UF	30	2	1,613	91	133	7
	Dry UF	639	18	1,724	48	1,253	34
	Total	**721**	**-**	**3,355**	**-**	**1,391**	**-**
Malheur	Cold UF	-0-	-0-	-0-	-0-	-0-	-0-
	Moist UF	-0-	-0-	466	79	121	21
	Dry UF	-0-	-0-	4,186	94	264	6
	Moist UW	0	0	168	100	0	0
	Total	**-0-**	**-**	**4,820**	**-**	**385**	**-**

Approximately 2,560 acres of Federal land proposed to convey within the Wallowa-Whitman NF are forested; represented by the sum of cold, moist, and dry upland forest potential vegetation groups. Dry forest comprises 65%, cold forest 33%, and moist forest 2% of the total forested acres (PR). Approximately 68% of the dry and 90% of the cold forest is currently mid-seral structure. Approximately 24% of the dry and 8% of the cold forest is late seral, including late and old structure (LOS). Approximately 8% of the dry forest is early seral. Thirty-three acres of late and old structure, within two parcels, are Forest Plan dedicated old growth. In addition, there are 434 acres in eight parcels of multi-strata late and old structure (PR).

Approximately 5,474 acres of Federal land proposed to convey within the Umatilla NF are forested; represented by the sum of cold, moist, and dry upland forest potential vegetation groups. Moist forest comprises 66%, dry forest 32%, and cold 1% of the forested acres (PR). Approximately 91% of the moist and 48% of the dry forest are currently in the mid-seral structure stages. Approximately 69% of the cold and 18% of the dry forest are in early-seral stages. Approximately 34% of the dry and 7% of the moist forests are in late-seral stages, including late and old structure (LOS). One parcel of seventy-five acres of mid-seral structure is Forest Plan dedicated old growth. In addition, there are 1,104 acres in twenty-three parcels of multi-strata, and 287 acres in eight parcels of single-strata late and old structure (PR).

Approximately 5,205 acres of Federal land proposed to convey within the Malheur NF are forested; represented by the moist, dry upland forest and the upland woodland potential vegetation groups. Dry forest comprises 86%, moist forest 11%, and woodland forest 3% of the forested acres (PR). Approximately 94% of the dry forest and 79% of the moist forest are currently in the mid-seral structure stages. Approximately 21% of the moist forest and 6% of the dry forest are in late-seral stages, including late and old structure (LOS). There are 385 acres of late and old structure, within three parcels, of Forest Plan dedicated old growth.

The non-Federal parcel distribution of forested acres by structural stage for each potential vegetation group considered for exchange within each of the three forests is described below and summarized in Table 38. The PR has the Upland Forest Vegetation information on forested acres, potential vegetation, and structure stage distribution by specific exchange parcel.

Table 38. Non-Federal Land Structure Stage Distribution by Potential Vegetation Group

National Forest	Potential Vegetation	Structural Stage Distribution					
		Early		Mid		Late	
		Acres	Percent	Acres	Percent	Acres	Percent
Wallowa-Whitman	Cold UF	-0-	-0-	61	100	-0-	-0-
	Moist UF	-0-	-0-	843	67	413	33
	Dry UF	-0-	-0-	1,818	99	26	1
	Total	**-0-**	**-0-**	**2,722**	**-**	**439**	**-**
Umatilla	Cold UF	-0-	-0-	31	100	-0-	-0-
	Moist UF	143	6	1,998	83	258	11
	Dry UF	1,636	21	6,310	79	-0-	-0-
	Total	**1,779**	**-**	**8,339**	**-**	**258**	**-**
Malheur	Cold UF	-0-	-0-	367	100	-0-	-0-
	Moist UF	-0-	-0-	937	100	-0-	-0-
	Dry UF	593	14	3,550	86	-0-	-0-
	Moist UW	0	0	152	100	0	0
	Total	**593**	**-**	**5,006**	**-**	**-0-**	**-**

Approximately 3,161 acres of private land proposed to acquire in the Wallowa-Whitman NF are forested; represented by the cold, moist, and dry upland forest potential vegetation groups. Dry forest comprises 58%, moist forest 40%, and cold forest 2% of the forested acres (PR). Approximately 99% of the dry forest and 67% of the moist forest are currently in the mid-seral stand structure stages. Approximately 1% of the dry forest and 33% of the moist forest are in late-seral stages, including late and old structure (LOS). There are 439 acres in five parcels of multi-strata late and old structure (PR).

Approximately 10,376 acres of private land proposed to acquire in the Umatilla NF are forested; represented by the cold, moist, and dry upland forest potential vegetation groups. Dry forest comprises 77%, and moist forest 23% of the forested acres, less than one percent is cold forests (PR). Approximately 79% of the dry forest and 83% of the moist forest are currently in the mid-seral stand structure stages. Approximately 21% of dry forest and 6% of moist forest are in early-seral stages. Approximately 11% of the moist forest is in the late-seral stages, including late and old structure (LOS). There are 258 acres in four parcels of multi-strata late and old structure (PR).

Approximately 5,599 acres of private land proposed to acquire in the Malheur NF are forested; represented by the cold, moist, and dry upland forest potential vegetation groups. Dry forest comprises 74%, moist forest 17%, cold forest 6%, and woodland forest 3% of the forested acres (PR). Approximately 86% of the dry forest, and 100% of moist and cold forest, are currently in the mid-seral stand structure stages. Approximately 14% of dry forests are in the early-seral

stages. There are no late and old structure stands on non-Federal lands proposed to acquire in the Malheur N.F.

Comparison of Existing and Historic Late Old Structure (LOS)

Historic structural stage distributions within those watersheds with a potential for a gain or loss of LOS provides a useful reference with which to compare existing and historic structure distribution. Table 39 compares existing and historic structure distribution by watershed and potential vegetation group. This table includes only those watersheds with exchange parcels having late and old structure (LOS). Current stand structure information, including percent of existing LOS, for Cottonwood Creek Watershed has not been determined and will not be compared.

Table 39. Comparison of Existing and Historic Late and Old Structure (LOS)

NationalForest	Watershed	Potential Vegetation	Existing % LOS	Historic % LOS	Percent Difference
Wallowa-Whitman	Big Sheep Creek	Dry UF	62	55	+7
	Upper Wallowa	Cold UF	37	40	-3
		Moist UF	24	45	-21
	Bear Creek	Dry UF	29	55	-26
	Lostine River	Moist UF	26	45	-19
	Grande Ronde/ Mud Creek	Dry UF	32	55	-23
Umatilla	Birch Creek	Moist UF	37	45	-8
		Dry UF	75	55	+20
	Lower Camus	Dry UF	37	55	-18
	Meacham Creek	Moist UF	17	45	-28
		Dry UF	22	55	-33
	N. Fork John Day /Potamus Creek	Dry UF	43	55	-12
	Lower N. Fork John Day	Dry UF	35	55	-20
	Rhea Creek	Cold UF	54	40	+14
		Moist UF	26	45	-19
		Dry UF	52	55	-3
	Upper Butter Creek	Dry UF	48	55	-7
Malheur	Lower N. Fork John Day	Moist UF	18	45	-27
		Dry UF	35	55	-20

Existing LOS includes NFS land only.
Percent historic is a combined average of multi-strata and single-strata LOS (Cold: 30% MS, 10% SS; Moist: 35% MS, 10% SS; Dry: 15% MS, 40% SS).
Percent difference of existing and historic indicates LOS deficit (-) or excess (+).
Lower N. Fork John Day watershed includes NFS land from Umatilla and Malheur NFs.

Of the watersheds within the Wallowa-Whitman NF, only the dry upland forest group in Big Sheep Creek currently has excess LOS. The other watersheds are currently deficit LOS, ranging from 3 to 26 percent below historic average. Of the watersheds within the Umatilla NF, the dry upland forest of Birch Creek and cold upland forest of Rhea Creek currently have excess LOS.

The remaining watersheds are currently deficit, ranging from 3 to 33 percent below historic average. The moist and dry upland forests of the Lower North Fork John Day on the Malheur NF are deficit LOS, 27 and 20 percent below historic average.

Old Growth

The conveyance of Federal parcels, currently assigned as dedicated Forest Plan old growth would require an amendment of the Wallowa-Whitman, Umatilla, and Malheur Forest Plans. Table 40 shows parcel numbers, parcel acres and watersheds having Federal parcels to convey that have dedicated old growth. Old growth replacement stands have been identified, as part of the mitigation measures necessary for compliance with existing Forest Plans.

Table 40. Forest Plan Dedicated Old Growth by Acres and Watershed

National Forest	Parcel Number	Acres	Watershed
Wallowa-Whitman	FW10	3	Big Sheep Creek
	FW24	30	Grande Ronde/Mud Creek
	Total	**33**	
Umatilla	FU24	75	Upper Butter Creek
	Total	**75**	
Malheur	FM16A	138	Lower N. Fork John Day River & Cottonwood Creek
	FM18	165	Lower N. Fork John Day River
	FM19	82	Lower N. Fork John Day River
	Total	**385**	

The Proposed Exchange Alternative would convey 33 acres of Forest Plan dedicated old growth (Management Area 15) from the Wallowa-Whitman NF. Thirty acres of old growth are within Parcels FW24 and three acres are within FW10. These 33 acres are currently dry forest multi-strata LOS (MSLT), with 30 acres in Grande Ronde/Mud Creek Watershed, and 3 acres in Big Sheep Creek Watershed. Sufficient dry forest, multi-strata LOS (MSLT) is available in both watersheds to replace the old growth lost.

Several candidate stands of old growth replacement were identified based on distance from the old growth being lost, adjacency to existing Forest Plan dedicated old growth, stand size, and minimum old growth characteristics represented. Old growth characteristics include a sufficient amount of large (over 21 inches in diameter) and old trees, snags, large down wood, canopy closure, and canopy layers.

Based on the above criteria, an assessment determined that Stand 2IH13S998090 (74 acres) best meets the criteria for replacement in the Grande Ronde/Mud Creek Watershed (Refer to Figure 1 on page 108). A determination was made to propose inclusion of the entire 74 acres (not just 30 acres) for replacement because of the need to have a replacement area large enough to stand-alone. This stand, composed of dry multi-strata LOS, is not adjacent to any other dedicated old growth and is located approximately two miles from the old growth in FW24 proposed for conveyance (Refer to Figure 2 on page 109).

The three acres in parcel FW10 of old growth proposed for conveyance in the Big Sheep Creek Watershed are part of a larger old growth stand. An assessment determined that adding three different acres from another stand immediately adjacent to the larger old growth would provide suitable replacement old growth. A determination was made that the three acres from the northeastern most portion of Stand 2JH16S931155 best meets the criteria for replacement in the Big Sheep Creek Watershed (Refer to Figure 1 on page 108). The replacement old growth is located between two peninsula-shaped sections of existing old growth.

Seventy-five acres of Forest Plan dedicated old growth (Management Area C1) would be conveyed from the Umatilla NF under the Proposed Exchange Alternative. This old growth is within Parcel FU24 and located in the Upper Butter Creek Watershed. The 75 acres are mid-seral structure (YFMS), rather than late and old structure. Dedicated old growth on the Umatilla NF is composed of "suitable" and "capable" old growth habitat. Suitable is defined as existing old growth tree habitat now meeting the minimum Regional FS definition (Region 6 Interim Old Growth Definitions). Capable old growth is defined as areas capable of becoming old growth in time, but not now meeting the Regional old growth tree habitat definition (Umatilla Forest Plan). Although the stand in Parcel FU24 is currently Forest Plan dedicated old growth, it is neither suitable nor capable old growth habitat (Van Winkle). It would likely take this stand more than 60 to 70 years to develop late and old structure and meet the minimum definition of old growth.

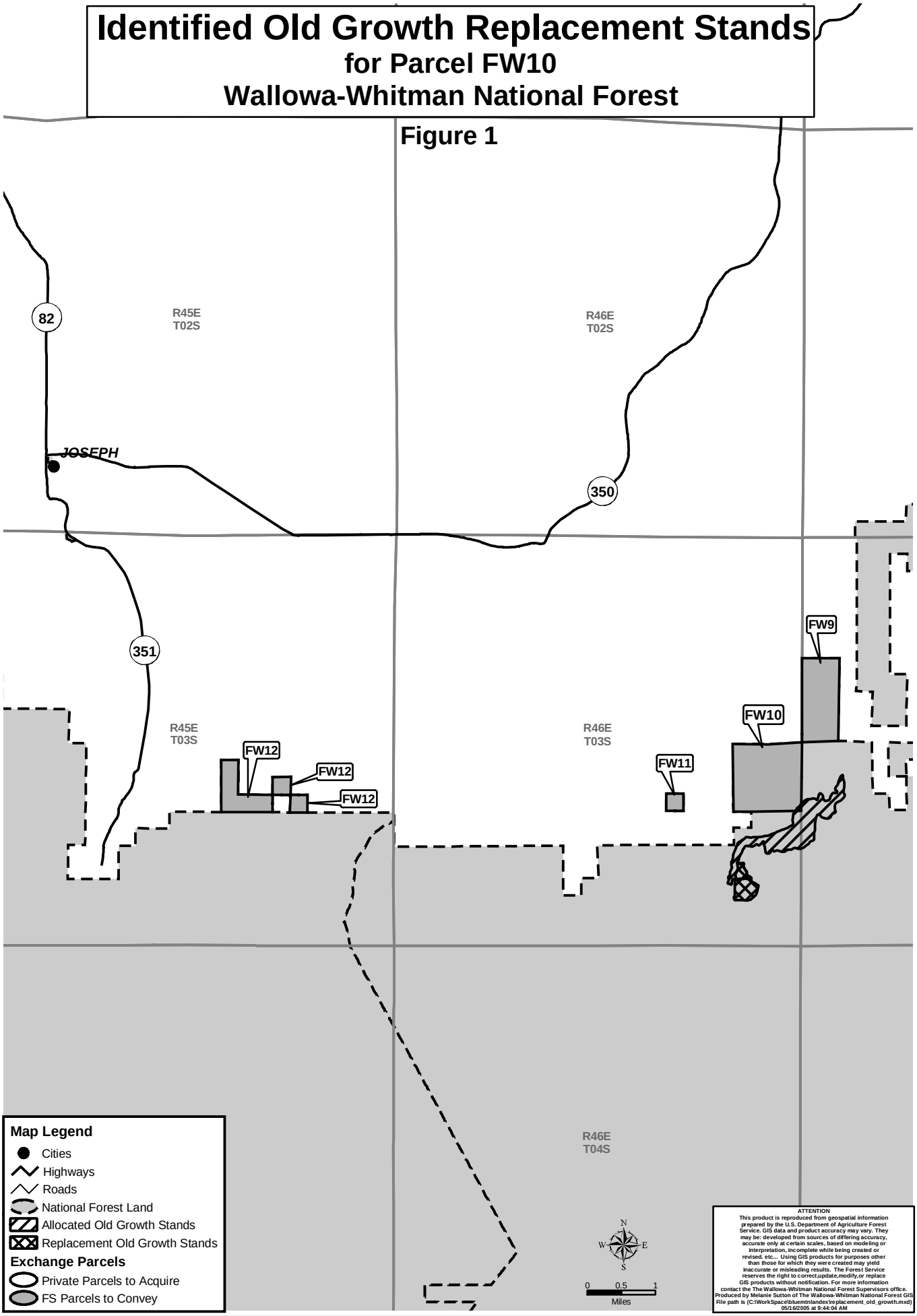
Several candidate stands of potential old growth replacement have been identified based on distance from the old growth being conveyed, adjacency to any existing Forest Plan dedicated old growth, stand size, and represented old growth characteristics. Based on the above criteria, an assessment determined that Stands 5970226 (32 acres) and 5970236 (66 acres) best meets the criteria for replacement in the Upper Butter Creek Watershed (Refer to Figure 3 on page 110). The two stands are contiguous, and are located approximately ½ mile from the old growth proposed for conveyance in parcel FU24. These stands are the closest replacement candidates to the existing old growth. They are composed of moist forest and are mid-seral structure (YFMS). They are the best candidate replacement stands available and are currently providing some old growth habitat characteristics for some of the Forests' management indicator species (Van Winkle). They are capable of becoming old growth and would likely develop late and old structure (meeting minimum old growth definition) in 40 to 60 years.

The Proposed Exchange Alternative would convey 385 acres of Forest Plan dedicated old growth (Management Area 13) from the Malheur NF. This old growth is located on Hamilton Ridge in a nearly contiguous block that provides pileated woodpecker habitat. The 385 acres are within Parcels FM16A (138 acres), FM18 (165 acres), and FM19 (82 acres). The 385 acres are currently dry (264 acres) and moist (121 acres) forest, multi-strata LOS. Of the old growth proposed for conveyance, 375 acres are in the Lower North Fork of John Day River Watershed and 10 acres (moist) are in the Cottonwood Creek Watershed. Replacement old growth acres of multi-strata or single-strata LOS currently does not exist in that portion of the Lower North Fork of John Day River Watershed on the Malheur National Forest or the portion of this watershed located on the Umatilla National Forest. Most of the 385 replacement acres would have to come from mid-seral structures. The replacement stands would likely take 60 to 70 years (for dry forests) and 50 to 60 years (moist forests) to develop LOS characteristics. Structure distribution information and replacement old growth availability is unknown for Cottonwood Creek Watershed.

Field reconnaissance and stand assessment has determined that the only replacement available for the 385 acres of old growth in parcels FM16A, FM18, and FM19 consist of two blocks with several stands each. The “western” block is approximately 210 acres and the “eastern” block is 148 acres. The closest one to the conveyed MA 13 is two miles to the east; the second area is nearly three miles to the east of the conveyed MA 13. A mile of grasslands and scattered timber separates the two replacement areas. Field reconnaissance of the western most replacement area was done by Cheri Miller (Blue Mountain Ranger District wildlife biologist). Stand data from GIS and aerial photographs were used to assess the other area. The proposed replacement areas are not currently old growth habitat and are not capable of supporting management indicator species that rely on mature of old growth habitat. An open road running the length of the western most area, isolation by surrounding timber harvests, and natural fragmentation due to land types (grasslands, natural openings) further contribute to unsuitable old growth conditions in these replacement areas. Based on existing conditions and the capability of the stands, it would likely require more than 60 years for these blocks to achieve old growth conditions capable of supporting reproducing pileated woodpeckers, goshawks, and other old growth associated wildlife species. The identified replacement areas represent the best options for replacement old growth, but do not meet direction in the Malheur LRMP for old growth. These replacements also appear to not adhere to the spacing criteria established to meet dispersal distances for dependant species. The 210 acre western block is composed of stands 211010016, 211010031, 211010146, 211010160, 211010170, 211010173, 211010190, 211010198, 211010235, 211010238, 211010239, and 211010362. The 148-acre eastern block is composed of Stands 304150109, 304150113, and 304150210 (Refer to Figure 4 on page 111).

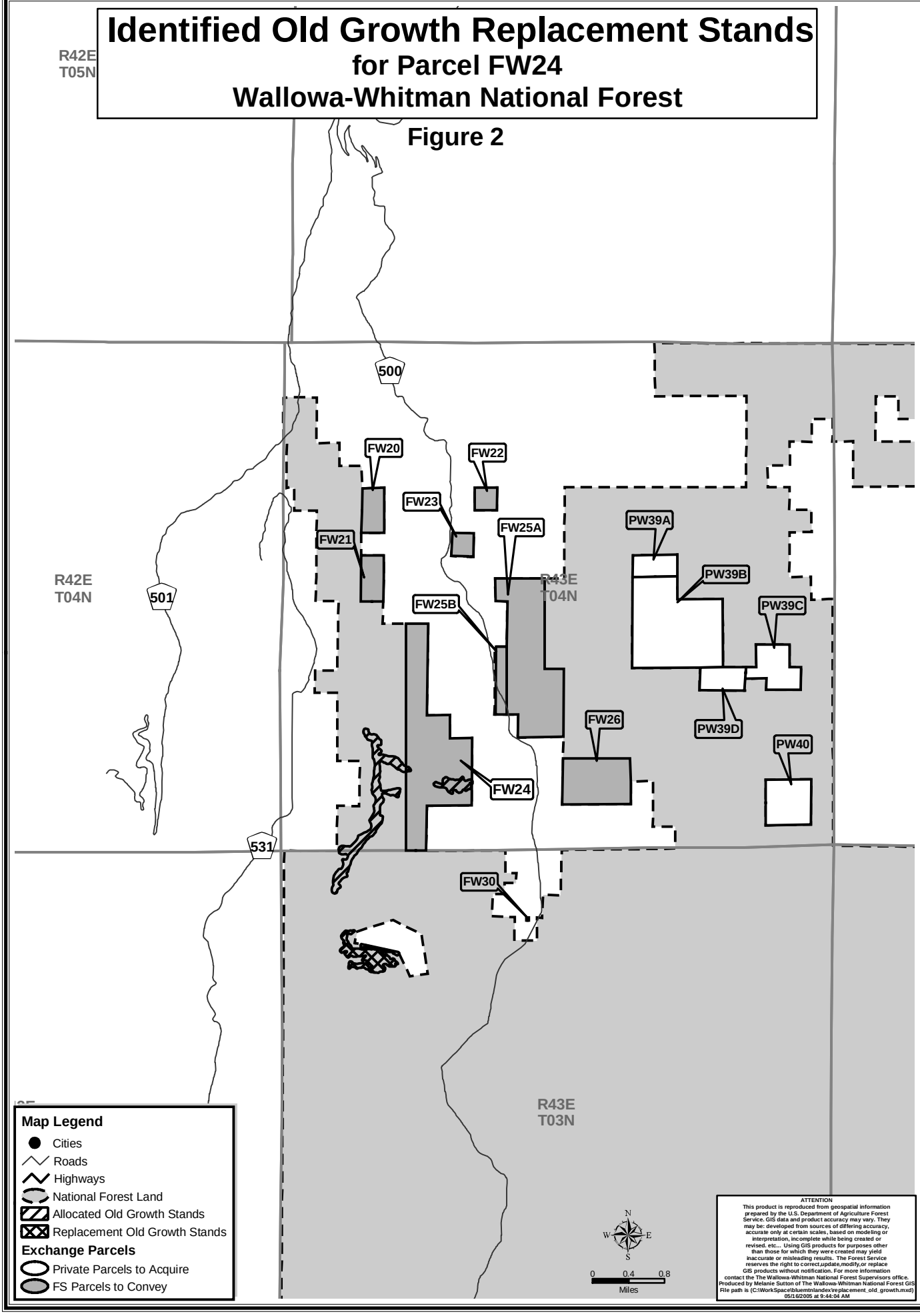
Identified Old Growth Replacement Stands
for Parcel FW10
Wallowa-Whitman National Forest

Figure 1



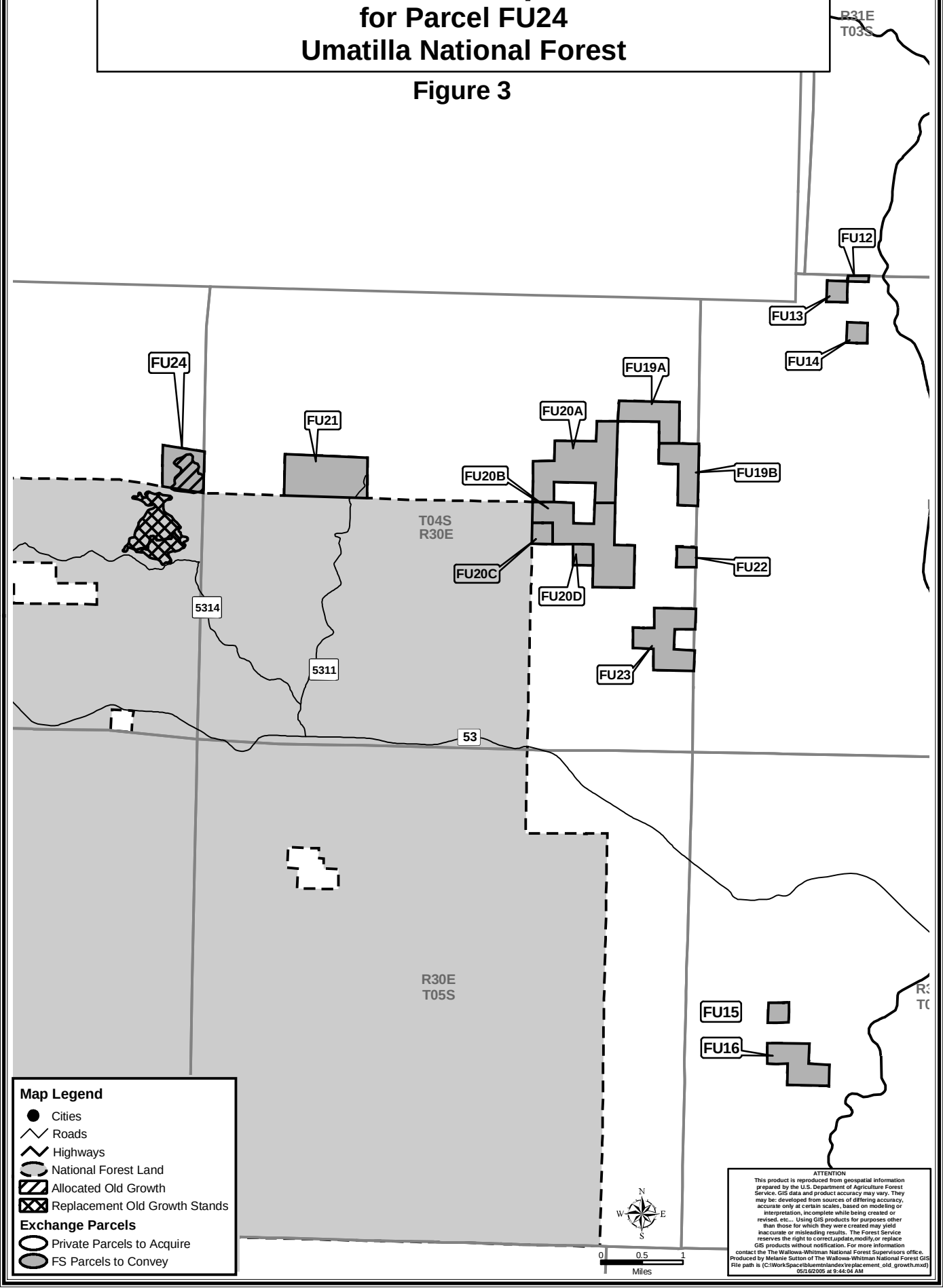
Identified Old Growth Replacement Stands
for Parcel FW24
Wallowa-Whitman National Forest

Figure 2



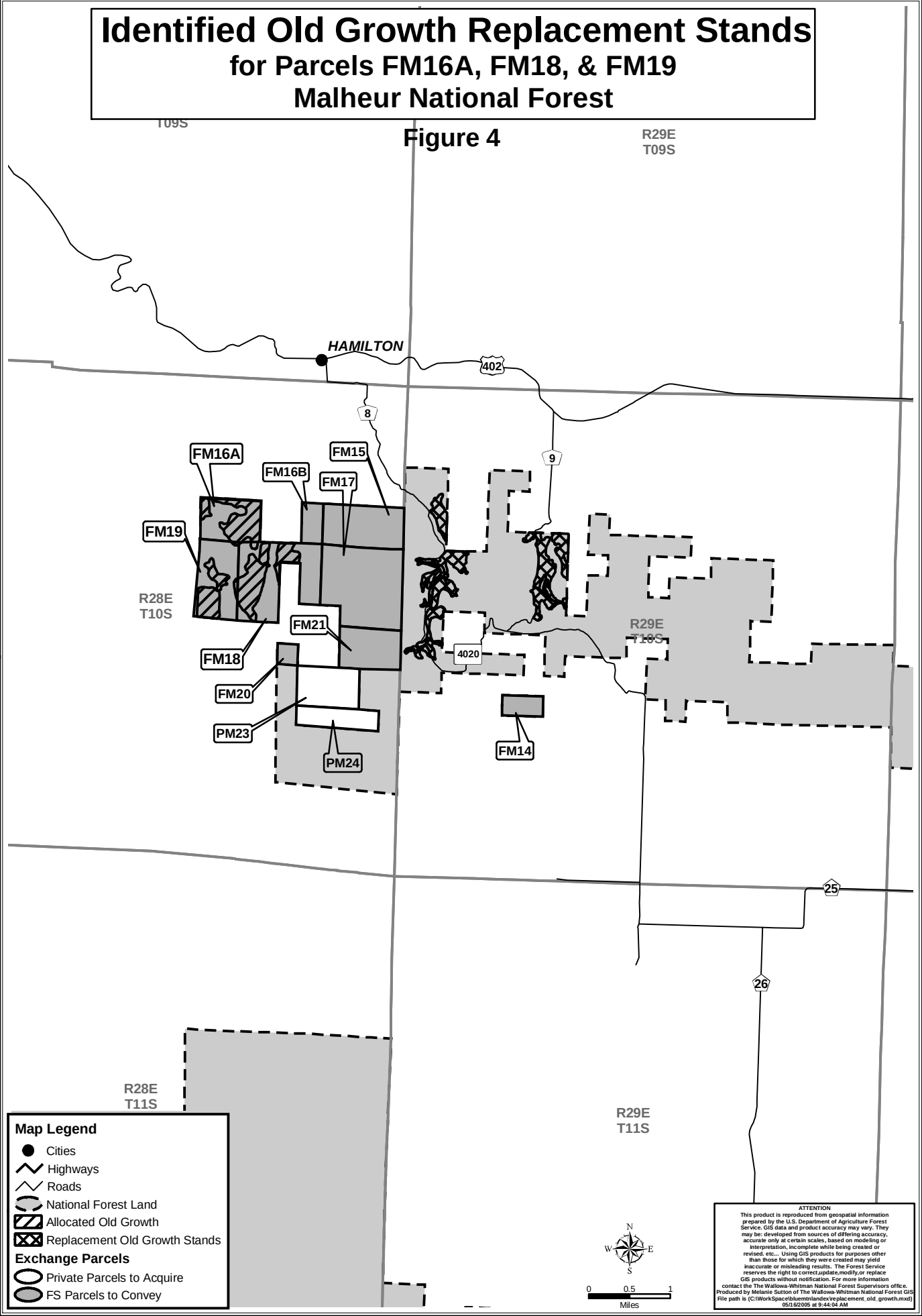
Identified Old Growth Replacement Stands
for Parcel FU24
Umatilla National Forest

Figure 3



Identified Old Growth Replacement Stands
for Parcels FM16A, FM18, & FM19
Malheur National Forest

Figure 4



Environmental Consequences

The net change in LOS by potential vegetation and by watershed is used to compare alternatives. Most watersheds involved in this land exchange are well below the historical range of variability for mature and old growth habitat, and some associated wildlife populations reflect this deficit. The gain or loss of LOS and dedicated old growth are measurement indicators of this issue. The time required to replace LOS conveyed through exchange is another consideration in this comparison of alternatives. Acquired older mid-seral stage stands would require fewer years than younger mid-seral stands to develop the old-forest characteristics required of LOS.

Measurement indicators are a means of assessing the extent to which alternatives address and respond to identified significant issues. Mitigation measures for replacing lost dedicated old growth are implemented where possible to comply with Forest Plan management direction on the Wallowa-Whitman, Umatilla, and Malheur National Forests.

Alternative 1: Proposed Exchange

Late and Old Structure (LOS)

The Proposed Exchange Alternative conveys LOS. The prospective new owners have indicated that they intend to log the commercial timber on these lands. Large-tree removal would result in current LOS being unable to function as late and old structure in the short and mid term. Alternative 1 would convey 2,205 acres and acquire 697 acres of late and old structure in the project area. The LOS conveyed includes Forest Plan dedicated old growth. Refer to Table 41 for conveyed and acquired LOS by watershed and potential vegetation. This table also displays the net acres gain/loss and the percent gain/loss from existing conditions on NFS lands.

Table 41. Conveyed and Acquired Late and Old Structure (LOS) for the Proposed Exchange

National Forest	Watershed	Potential Vegetation	NFS LOS Acres Conveyed	Private LOS Acres Acquired	Net Acres Gain (+) Loss (-)	Percent Gain (Loss (-)
Wallowa-Whitman	Big Sheep Creek	Dry UF	209	-0-	-209	-1
	Upper Wallowa	Cold UF	64	-0-	-64	-2
		Moist UF	-0-	409	+409	+1
	Bear Creek	Dry UF	7	-0-	-7	-0-
	Lostine River	Moist UF	-0-	4	+4	-0-
	Grande Ronde/ Mud Creek	Dry UF	187	26	-161	-1
	Total	**All**	**467**	**439**	**-28**	**-**
Umatilla	Birch Creek	Moist UF	31	-0-	-31	-0-
		Dry UF	121	-0-	-121	-1
	Lower Camus	Dry UF	470	-0-	-470	-2
	Meacham Creek	Moist UF	26	258	+232	+2
		Dry UF	346	-0-	-346	-2
	N. Fork John Day/ Potamus Ck.	Dry UF	142	-0-	-142	-0-
	Rhea Creek	Cold UF	5	-0-	-5	-1
		Moist UF	62	-0-	-62	-1
		Dry UF	5	-0-	-5	-0-
	Upper Butter Ck.	Dry UF	107	-0-	-107	-2
	Total	**All**	**1,315**	**258**	**-1,057**	**-**
Malheur	Lower N. Fork John Day	Moist UF	111	-0-	-111	-18
		Dry UF	302	-0-	-302	-8
	Cottonwood Creek	Moist UF	10	-0-	-10	Unknown
	Total	**All**	**423**	**-0-**	**-423**	**-**

Malheur NF portion of Lower N. Fork John Day watershed (Dry UF) includes 38 acres of Umatilla NF.
Percent gain or loss is the change from existing conditions.
Amount of existing LOS in Cottonwood Creek is unknown.
NFS acres of LOS lost include Forest Plan dedicated old growth from the Wallowa-Whitman and Malheur NFs; the Umatilla NF dedicated old growth is not included because this dedicated old growth does not qualify as LOS (refer to old growth discussion.)

The Wallowa-Whitman NF would convey 467 acres, and acquire 439 acres of LOS; all of the LOS acquired and conveyed is multi-strata (three or more tree layers) (PR). The LOS conveyed includes 33 acres of Forest Plan dedicated old growth. Approximately 403 acres of dry forest LOS and 64 acres of cold forest LOS would be conveyed. Nearly 85 percent of LOS conveyed

would be located in the Big Sheep and Grande Ronde/Mud Watersheds. Approximately 413 acres of moist forest LOS and 26 acres of dry forest LOS would be acquired. Over 93 percent of the LOS that would be acquired is in the Upper Wallowa Watershed. Only moist forests of the Upper Wallowa and Lostine River Watersheds would increase from the existing conditions in LOS. The other watersheds would decrease from 7 to 209 acres of LOS.

The Umatilla NF would convey 1,353 acres and acquire 258 acres of late and old structure. Of the LOS conveyed, 1,066 acres are multi-strata and 286 acres are single-strata (PR). Approximately 1,229 acres of dry forest LOS, 119 acres of moist forest LOS, and 5 acres of cold forest LOS would be conveyed. Over 73 percent of the LOS conveyed is located in Birch, Lower Camus, and Meacham Creek Watersheds. Only the moist forest of Meacham Creek would increase from the existing conditions in LOS; gaining 258 acres. The remaining watersheds would decrease from 5 to 470 acres of LOS.

All 385 acres of late and old structure that would be conveyed from the Malheur NF are Forest Plan dedicated old growth (refer to Old Growth narrative). Thirty-eight acres of LOS that would be conveyed from the Lower North Fork John Day River (Table 41) are actually part of the Umatilla NF, and are not Forest Plan dedicated old growth. No LOS acres would be acquired. The dedicated old growth that would be conveyed includes Parcel FM16A (138 acres), Parcel FM18 (165 acres), and Parcel FM19 (82 acres). All of the dedicated old growth conveyed would be multi-strata, 264 acres of dry forest and 121 acres of moist forest. All but 10 acres conveyed would be located in the Lower North Fork John Day River Watershed. The Malheur NF portion of the Lower North Fork John Day River Watershed would convey 111 acres of moist forest and 302 acres of dry forest. The remaining 10 acres of LOS conveyed would be located in the Cottonwood Creek Watershed.

The indirect and cumulative effects of conveying LOS has to do with ecological sustainability; the ability to sustain historic conditions on NFS lands within the context of naturally occurring disturbance regimes. Because native species are adapted to the disturbance regime of an area, ecosystem elements occurring within their historic range are believed to represent sustainable, resilient, productive, and healthy conditions. LOS levels outside the historic range are believed to be at greater risk of potentially losing ecosystem function, therefore putting some native species dependant on LOS at risk. Refer to the watershed, wildlife, and fisheries sections for discussions on indirect and cumulative effects to native species.

The extent to which LOS gain or loss on NFS lands influences a watershed depends on a comparison of existing LOS to historic conditions. The historic range and average mid-point have been used as benchmarks for comparing existing and historic levels. Comparison to a historic range is often used since structural stage levels naturally fluctuate over time. However, the historic mid-point is a more useful benchmark in this analysis because of the general under-representation of LOS and the best science represented by ICBEMP that emphasizes moving toward attainment of LOS at levels meeting the historic range of variability midpoint. Watersheds with less LOS than the historic mid-point are considered deficit while those with more than the historic mid-point are considered excess. LOS conveyed in watersheds already deficit is considered as having a greater adverse effect than LOS conveyed in watersheds currently in excess. Refer to Table 42 for a comparison of percent historic average LOS with existing percent LOS and the percent LOS resulting from the Proposed Land Exchange.

Table 42. Percentage of (LOS) for Historic, Existing, and Proposed Exchange

National Forest	Watershed	Potential Vegetation	Historic % LOS	Existing % LOS	Proposed Exchange % LOS
Wallowa-Whitman	Big Sheep Creek	Dry UF	55	62	61
	Upper Wallowa	Cold UF	40	37	35
		Moist UF	45	24	25
	Bear Creek	Dry UF	55	29	29
	Lostine River	Moist UF	45	26	26
	Grande Ronde/ Mud Creek	Dry UF	55	32	31
Umatilla	Birch Creek	Moist UF	45	37	37
		Dry UF	55	75	74
	Lower Camus	Dry UF	55	37	35
	Meacham Creek	Moist UF	45	17	19
		Dry UF	55	22	20
	N. Fork John Day/Potamus Creek	Dry UF	55	43	43
	Rhea Creek	Cold UF	40	54	53
		Moist UF	45	26	25
		Dry UF	55	52	52
	Upper Butter Creek	Dry UF	55	48	46
Malheur	Lower N. Fork John Day	Moist UF	45	18	-0-
		Dry UF	55	35	27

Includes only those watersheds with exchange parcels (FS or private) having LOS.
Percent historic LOS is a combined average of the historic range for multi-strata and single-strata LOS.
Percent existing LOS is the total of both multi-strata and single-strata LOS.
Lower N. Fork John Day watershed includes NFS land from Umatilla and Malheur NFs.

Those watersheds gaining substantial LOS, the moist forests of Upper Wallowa River and Meacham Creek, would remain 20 and 26 percent deficit respectively. The LOS deficit in the Lower North Fork John Day Watershed would increase from 27 to 45 percent in moist forests and from 20 to 28 percent in dry forests. LOS deficits in the dry forests of Bear, Grande Ronde/Mud, Lower Camus, and Meacham Creek, would be 20 percent or greater. The LOS deficit in moist forests of Rhea Creek would also be twenty percent. None of the watersheds currently having excess LOS of a particular potential vegetation group would become deficit as a result of the Proposed Land Exchange. The dry forests of Big Sheep and Birch Creek, and cold forests of Rhea Creek would continue to have excess LOS, although each watershed has a net reduction in LOS.

Past management practices, including fire suppression and timber harvest, have resulted in a shift from single-strata LOS toward multi-strata LOS, especially in dry forests. Therefore, in addition to being deficit from the historic average, most Blue Mountain watersheds are also currently below the historic range for single-strata LOS in dry forests.

In summary by forest, the percentage LOS reduction or increase would change little in the *Wallowa-Whitman NF* watersheds. Most watersheds would remain deficit from the historic

average, and below the historic range in single-strata LOS due to existing conditions. The percentage LOS reduction or increase would change little in the *Umatilla NF* watersheds. Most of the watersheds would remain deficit from the historic range in either single-strata or multi-strata LOS, and the historic average in both structures due to existing conditions. The highest percentage LOS reduction from the proposed exchange occurs in that portion of the Lower North Fork John Day River Watershed on the *Malheur NF*. The watershed's moist and dry forests would be reduced 18 and 8 percent respectively, remaining deficit from the historic average. For a detailed discussion on the change from the existing condition to what would occur from the Proposed Land Exchange refer to the Vegetation Specialist Report in the PR.

Unlike Forest Plan dedicated old growth, a forest plan amendment is not required to convey LOS on NFS lands. However it is desirable to move forests toward the historic range of variability at the landscape scale (ICBEMP). An assessment of the time required to replace conveyed LOS would disclose the anticipated duration of effects (Refer to table 43). The longer the time required to achieve late/old structural characteristics, the greater the likely potential effects would be. Natural attainment of late and old structure characteristics would take many years. Therefore, "replacement" of LOS would not occur immediately. Since large-tree densities distinguish LOS in the Blue Mountains, attainment of a large-tree component is important. Stands having a large tree component commonly have several trees greater than 20 inches in diameter. The time required for attainment of large-trees depends on potential vegetation, current tree size and growth rate. Stands with larger, older trees on moist sites require less time to reach LOS structure than stands with smaller trees on drier sites. Because of the Eastside Screens, any future projects proposed in these watersheds would be required to consider the status of LOS before prescribing treatments. In watersheds with deficit LOS, treatments would only be prescribed if they accelerate or maintain LOS. Only dedicated old growth areas require replacement when they are lost to disturbance, conveyed in an exchange, or a better quality stand is identified. Actual "replacement" of late and old structure stands would not occur for at least 50 years (moist forests) until LOS characteristics develop. In the interim, these stands would not provide old-forest habitat. Refer to the Wildlife section for specific effects to old-forest dependent species.

Table 43. Alternative 1- LOS Replacement by Potential Vegetation in Watersheds

Watershed	Potential Vegetation	LOS Acres Needing Replacement	Potential Replacement Existing Structure	Years to Attain LOS
Upper Wallowa	Cold UF	64	MSLTU	80 - 100
Bear Creek	Dry UF	7	MSLTU	60 - 70
Grande Ronde/ Mud Creek	Dry UF	161	MSLTU	60 - 70
Birch Creek	Moist UF	31	YFMS	50 - 60
Lower Camus	Dry UF	470	YFMS	60 - 70
Meacham Creek	Dry UF	346	YFMS	60 - 70
N. Fork John Day/Potamus Creek	Dry UF	142	YFMS	60 - 70
Rhea Creek	Moist UF	62	YFMS	50 - 60
	Dry UF	5	YFMS	60 - 70

Table 43. Alternative 1- LOS Replacement by Potential Vegetation in Watersheds (continued)

Watershed	Potential Vegetation	LOS Acres Needing Replacement	Potential Replacement Existing Structure	Years to Attain LOS
Upper Butter Creek	Dry UF	107	YFMS	60 - 70
Lower N. Fork John Day	Moist UF	121	YFMS	50 - 60
	Dry UF	302	YFMS	60 - 70

Assumes current average top layer tree diameter of 13 inches (Cold UF) and 14 inches (Moist & Warm UF)
Years to attain LOS (average top layer tree diameter of 21 inches) assumes 1.0 to 1.2 inches diameter growth-per-decade (Dry UF), 0.8 to 1.0 inches diameter growth per decade (Cold UF), 1.2 to 1.5 inches diameter growth-per-decade (Moist UF)

Old Growth

The Proposed Exchange Alternative would convey 33 acres of Forest Plan dedicated old growth from the Wallowa-Whitman NF in the Grande Ronde/Mud and Big Sheep Creek Watersheds. Replacing 30 acres of existing old growth in the Grande Ronde/Mud Watershed with 74 acres of late and old structure forest would have a positive effect because it results in a net increase of old growth acres set-aside to provide old growth habitat. Both the existing and replacement stands have similar old growth attributes. The replacement stand has sufficient amounts of large trees, snags, multiple canopy layers, and crown cover to provide suitable old growth. The location of this replacement stand appears to enhance connectivity for old growth associated wildlife species between two other allocated old growth areas, assuming the old growth allocation approach is continued in the next Forest Planning effort. In actuality, the current structure based (HRV) approach to forest management will do a better job of providing for connectivity between old growth habitat patches than provided by the old growth allocation approach. This means that even though the identified replacement old growth area appears to improve connectivity, it is a moot point considering that the HRV approach would have at least an equal or better result. These replacement old growth areas represent a net increase in MA 15 of 44 acres. The locations of the replacement areas appear to meet the distribution criteria established in Appendix M of the Wallowa-Whitman Land and Resource Management Plan (W-W LRMP 1990). Replacing a 3-acre portion of a larger old growth area in the Big Sheep Creek Watershed with 3 acres of forest, adjacent to another part of the same old growth stand, would have a positive effect because of the connectivity the replacement acres would provide (Knox). The two peninsula-shaped sections of existing old growth would be joined, ensuring the area between to be managed for providing old growth habitat.

Replacement of dedicated old growth with the stands identified above is consistent with the Wallowa-Whitman Forest Plan goals because they provide suitable old growth habitat for wildlife. The replacement stands are consistent with the Wallowa-Whitman Forest Plan standards and guidelines because they have sufficient amounts of large trees and snags (for dry forest types). In addition, replacement stands were selected from sites having similar character to the old growth stands they would replace. Because the location of the dedicated old growth would change, the Wallowa-Whitman Forest Plan would be amended to designate the replacement stands as Old Growth.

The Proposed Exchange Alternative would convey 75 acres of Forest Plan old growth from the Umatilla NF in the Upper Butter Creek watershed. Replacing 75 acres of existing dedicated old growth in Upper Butter Creek with 98 acres of forest would have a positive effect from a net increase of old growth acres set-aside to provide old growth habitat. The replacement stands are

currently providing some old growth habitat and are capable of providing suitable habitat in 40 to 60 years; compared to 60 to 70 years for the existing dedicated old growth. The old growth characteristics of the two replacement stands are currently better represented than the old growth characteristics of the dedicated old growth in Parcel FU24.

Replacement of dedicated old growth with the stands identified above is consistent with the Umatilla Forest Plan goals because the replacement stands currently have better old growth characteristics and currently provide some old growth habitat characteristics for management indicator species. In addition, the replacement stands would provide suitable old growth habitat for wildlife sooner than the currently dedicated old growth. The replacement stands are consistent with the Umatilla Forest Plan standards and guidelines because the replacement habitat is better than the original dedicated old growth habitat. Because the location of the dedicated old growth would change, the Umatilla Forest Plan would be amended to designate the replacement stands as Old Growth.

The Proposed Exchange Alternative would convey 385 acres of Forest Plan dedicated old growth from the Malheur NF in the Lower North Fork of John Day River and Cottonwood Creek Watersheds. Replacement old growth acres of multi-strata or single-strata LOS are currently limited in that portion of the Lower North Fork of John Day River Watershed. There are a sufficient amount of acres of mid-seral stands that potentially would attain late and old structure (50-60 years for moist forests and 60-70 years for dry forests) in the future. Field reconnaissance and stand assessment has identified two blocks of 358 acres that are the most similar to the old growth proposed for conveyance and are the best available replacement candidates. Given time, these stands would likely develop the minimum old growth characteristics required for tree size, snags, canopy cover, canopy layers, and down wood. Actual “replacement” of old growth would not occur for at least 50 years (moist forests) until old-forest characteristics develop. In the interim, these stands would not provide old-forest habitats. Refer to the Wildlife section for effects to old-forest dependent species. However even with time, these replacement stands are not large enough by themselves, nor are they contiguous to similar stands to form a 300-acre block that provides suitable pileated woodpecker habitat.

The Forest Plan requires dedicated old growth managed as pileated woodpecker habitat to be 300 acres or larger, although blocks of less than 300 acres are acceptable if the areas are separated by less than ¼ mile. The two identified blocks do not meet this requirement. Therefore, replacement of 385 acres of existing old growth in the Lower North Fork of John Day River Watershed with two blocks of 358 acres does not meet the Malheur Forest Plan direction for old growth. The Malheur Forest Plan would be amended by any decision to implement this alternative to allow the replacement Old Growth despite this reduction in designated pileated woodpecker habitat. In addition, because the location of the dedicated old growth would change and the replacement stands do not meet LRMP guidelines, the Malheur Forest Plan would be amended to designate the replacement stands as Old Growth. Refer to the wildlife section on late and old structure habitat for a discussion on the effects to old growth dependant species.

Alternative 2: No Action

This alternative would result in no change of ownership. There would be no conveyance of Forest Plan dedicated old growth and no conveyance or acquisition of LOS. Forest Plan amendments on dedicated old growth would not be required.

Watersheds with LOS levels currently outside the historic range would continue to be at risk of compromised ecosystem function, therefore likely putting some native species at risk. Refer to Table 42, for a comparison of existing percent LOS with historic percent LOS.

Alternative 3: Purchase

This alternative would only purchase high priority parcels. Forest Plan amendments on dedicated old growth would not be required. Direct effects to LOS would be minimal because only one parcel proposed for purchase has LOS. The Purchase Alternative would gain four acres (Parcel PW37) of moist upland forest, multi-strata LOS. The four acres gained would occur in the Lostine River Watershed that is currently deficit 19 percent LOS from historic levels. Of the 55,026 acres of moist upland forest in the Lostine River Watershed, 14,058 acres are LOS. The four acres gained would not appreciably change the LOS deficit. Watersheds with LOS levels currently outside the historic range would continue to be at risk of losing ecosystem function, therefore likely putting some native species at risk. Refer to Table 42, for a comparison of existing percent LOS with historic percent LOS.

Alternative 4: Deed Restriction

Private forest management options would be limited for all conveyed Federal parcels because of the deed restriction prohibiting harvest of trees over 21 inches in diameter. This restriction retains the large-tree component of late and old structure. However, Alternative 4 does not ensure that conveyed Forest Plan dedicated old growth would continue to function as old-forest habitat. Subsequent harvest of understory trees after conveyance could eliminate a tree canopy layer and reduce crown cover, key components of old-forest habitat of multi-strata forests. Loss of a canopy layer and reduction in the crown cover affects a stand's ability to function as old-forest habitat. Refer to the Wildlife section for specific effects to old-forest dependent wildlife species. Forest Plan amendments would still be required to convey dedicated old growth. Loss of Forest Plan dedicated old growth would occur from the Wallowa-Whitman (33 acres), Umatilla (75 acres), and Malheur (385 acres) National Forests. Refer to Table 40, for a list of Federal parcels with Forest Plan old growth. The Alternative 1, Environmental Consequences section, discloses effects related to old growth replacement.

The 2,205 acres of LOS conveyed would retain the large-tree component of late and old structure due to the deed restriction. Whether the LOS conveyed remains late and old structure depends on the level of subsequent harvest. Harvest of smaller understory trees could eliminate a tree canopy layer and reduce crown cover, key components of late and old structure in multi-strata forests. Loss of a canopy layer and reduction in crown cover affects a stand's ability to function as old-forest habitat. The 287 acres of single-strata LOS would likely remain late and old structure and may function as old-forest habitat.

It is difficult to predict the level of harvest that may occur on conveyed parcels containing LOS, especially with the restriction to retain large trees. Harvest may be economically unfeasible on some stands due to lack of access and steepness of slope. Harvest of smaller understory trees on some stands may remove only particular high-value tree species, leaving sufficient amounts of other trees to constitute a canopy layer and retain adequate crown cover. Since the level of subsequent harvest cannot be accurately predicted, it is assumed that the 2,205 acres of LOS conveyed would remain as late and old structure. In terms of large live trees and the restriction on removal of >21"DBH live trees it would not necessarily preclude the loss of LOS habitat as it relates to wildlife.

The FS would acquire fewer non-Federal parcels due to a lower fair market value of Federal parcels. In this alternative, only four acquired parcels have LOS resulting in a net gain of 413 LOS acres. Refer to Table 44 for Alternative 3 LOS gained by forest.

Table 44. Alternative 3- Gain of Late and Old Structure (LOS)

National Forest	Watershed	Potential Vegetation	Private LOS Acres Gained	Percent Gain
Wallowa-Whitman	Upper Wallowa	Moist UF	409	+1
	Lostine River	Moist UF	4	-0-
	Total	**All**	**413**	**-**
Umatilla	**Total**	**All**	**-0-**	**-**
Malheur	**Total**	**All**	**-0-**	**-**

Percent gain is the change from existing conditions. Less than one percent gain = -0-.

The cumulative effects associated with the minimal gain in LOS under this alternative would be insignificant. All of the watersheds gaining LOS would remain below historic levels. The largest increase of LOS would occur in the Upper Wallowa watershed (409 acres). The increase would only raise LOS above existing levels by 1%.

All Alternatives- Summary

Refer to the following Tables 45 and 46 for a summary on comparison of alternatives by a net reduction of LOS acres and by acres of old growth conveyed.

Approximately 1,508 net acres of late and old structure would be conveyed under the Proposed Exchange Alternative, including 493 acres of dedicated old growth. Forest plan amendments are not required to convey LOS (other than Forest Plan old growth) to another ownership. No LOS would be conveyed under the No Action Alternative. Four acres of LOS would be gained under the Purchase Alternative. Approximately 1,792 acres of LOS would be reduced under the Deed Restriction Alternative.

A reduction in the amount of LOS would not constitute an irreversible and irretrievable commitment of resources because LOS is a temporal stage of forest development that is continuously being replaced across the landscape over time.

The Proposed Exchange and Deed Restriction Alternatives would convey 493 acres of Forest Plan dedicated old growth. The Forest Plans of the Wallowa-Whitman, Umatilla, and Malheur National Forests would need amendments to convey dedicated old growth to another ownership. Identified old growth replacement on the Wallowa-Whitman N.F. is currently suitable habitat. Identified old growth replacement on the Umatilla N.F. does not currently meet minimum requirements for some old growth components, but is currently better habitat than the dedicated old growth stand it would replace and it is capable of providing suitable habitat in the future. Identified old growth replacement on the Malheur N.F. does not currently meet minimum requirements for most old growth components. It does not meet stand size and does not provide suitable old growth tree habitat for pileated woodpecker. No dedicated old growth would be conveyed under the No Action or Purchase Alternatives. Forest Plan dedicated old growth conveyed under the Deed Restriction Alternative would likely retain late and old structural characteristics due to the restriction requiring retention of large trees. However, this alternative

does not ensure all the characteristics necessary to provide suitable old growth habitat are retained in the future. Refer to the Wildlife section for a disclosure on effects to wildlife.

Table 45. Alternative Comparison by Net Reduction of LOS Acres

Measurement Comparison	National Forest	Alt 1	Alt 2	Alt 3	Alt 4
Late and Old Structure Net Acres Gained (+) or Lost (-)	Wallowa-Whitman	-28	-0-	+4	-54
	Umatilla	-1,057	-0-	-0-	1,315
	Malheur	-423	-0-	-0-	-423
	Total	-1,508	-0-	+4	-1,792

Net acres of LOS include dedicated old growth from the Wallowa-Whitman and Malheur NFs.

Table 46. Alternative Comparison by Acres of Old growth Conveyed

Measurement Comparison	National Forest	Alt 1	Alt 2	Alt 3	Alt 4
Forest Plan Old growth Acres Conveyed	Wallowa-Whitman	33	-0-	-0-	33
	Umatilla	75	-0-	-0-	75
	Malheur	385	-0-	-0-	385
	Total	493	-0-	-0-	493

Old growth lost to be replaced with currently suitable habitat (Wallowa-Whitman), or capable habitat (Umatilla), or unsuitable habitat (Malheur).

Threatened and Endangered Vegetation Species

Management activities considered in this DEIS require an affects analysis be completed on all threatened, endangered and sensitive species. This process analyzes and documents the predicted effects of proposed management activities necessary to ensure that the action alternatives would not jeopardize the continued existence or cause adverse modification of habitat for:

- Species listed, or proposed to be listed, as endangered or threatened under the Endangered Species Act P.L. 93-205 (ESA) by the U.S. Fish and Wildlife Service. Threatened, endangered and proposed plant species that may occur in the project area were provided by the U.S. Fish and Wildlife Service (USFWS)(USDI, Fish and Wildlife Service, Letter to Karen Wood, Species list number SP # 1-4-02-SP-912, of September, 2002). Threatened, endangered or proposed plants are not known or suspected to occur on the Malheur National Forest. There are no known occurrences of endangered, threatened, or proposed, plant species within or adjacent to proposed lands to convey or acquire on the Umatilla National Forest.
- Species designated “sensitive” by USDA FS, Pacific Northwest Region. Species considered in this analysis include sensitive plants listed by the Regional Forester in the Pacific Northwest Region (R6). There are no known occurrences of sensitive plant species within or adjacent to proposed lands to convey or acquire on the Umatilla National Forest. Sensitive plants were not found on the Malheur National Forest.
- Plants considered rare or endemic in the Hells Canyon National Recreation Area (HCNRA).

Sensitive species are those species for which population viability is a concern such that additional impacts to the species may diminish species diversity goals of the FS or cause a trend toward Federal listing.

Further, to comply with the statutory language of the HCNRA Act that compels the preservation of rare and endemic plants (PL 94-199), the HCNRA Comprehensive Management Plan (CMP) defines the terms "rare" and "endemic" as applied to plants in addition to establishing standards for these plants that agency actions must incorporate. Rare plants are equivalent to FS sensitive plants known or suspected to occur in the HCNRA plus plants with disjunct (separated) populations within the HCNRA. Endemic plants are those plant species confined largely to the boundary of the HCRNA. Since some exchange parcels are within the HCNRA, this discussion will refer to sensitive plants, disjunct plants, or endemic plants where appropriate.

Field inventories were conducted on all Federal parcels to determine which, if any, sensitive, rare, and endemic species might be present. These inventories were conducted during the last 10-year period. Surveys were conducted during May through July, except for parcel FW30, which was inventoried a second time on September 11, 2003, for the presence of Spalding's catch-fly. The Threatened, Endangered, Sensitive, Rare, and Endemic Plant Reports (Yates and Riley, 2004) and field inventories are available for review in the PR.

The Oregon Natural Heritage Program database was examined for rare plant sites known to exist on non-Federal parcels to be acquired under the Proposed Land Exchange. These parcels were not field reviewed.

The boundaries of the affected environment for threatened, sensitive, rare, and endemic plants consist of the boundaries of known plant sites that fall partly or wholly on the Federal parcels located on the three National Forests and the boundaries known to occur on private parcels to acquire. Some sensitive, rare, or endemic plant sites occur in numerous distinct patches growing in proximity. In these cases, the logical resource unit analysis boundary is the affected site or patch occurring on a land exchange parcel plus the nearby community of plant sites. Where necessary, these instances are described below.

Affected Environment

The following Federally listed Threatened plant species were not found on NF parcels to convey: *Howellia aquatillis* (Water Howellia), *Spiranthes diluvialis* (Ute ladies'tresses), *Silene spaldingii* (Spalding's Catch-fly), and *Thelypodium howellii* var. *spectabilis* (Howell's Spectacular Thelypody).

Parcel FW8, a parcel to convey located on the Wallowa-Whitman NF contains one patch or occurrence of Mimulus clivicola (Bank Monkey-Flower), a FS sensitive plant. The Mimulus clivicola site in parcel FW8 is located in the southern portion of the HCNRA, an area where most Mimulus clivicola sites have been found on the forest. Mimulus clivicola is known to inhabit 55 patches on the Wallowa-Whitman NF. The population sizes of these patches range from 25 to over 6000 plants. Because Mimulus clivicola is an annual plant, population sizes may vary from year to year due to environmental factors, especially precipitation. The Mimulus site in parcel FW8 has a reported population size of 200 plants, which is typical of many of Mimulus clivicola sites found. This particular site represents less than 2% of the known Mimulus clivicola sites on the Wallowa-Whitman NF. This site is located in the Himmelwright Grazing Allotment, which is in vacant status; therefore livestock currently do not graze the site.

Parcel PW20A, a parcel to acquire, holds one population of Marabilis macfarlanei (MacFarlane's four-o'clock). This is a Federally threatened plant locally endemic to the HCNRA in northeast Oregon and adjacent west central Idaho. The known range of MacFarlane's four-o'clock is about 29 miles by 18 miles. Eleven populations comprise the distribution of MacFarlane's four-o'clock in three principal disjunct geographic vicinities: the Snake River, Salmon River, and Imnaha River canyons. Two populations occur in the Imnaha River valley. One of these, the Buck Creek population, is found within the analysis area on private land in parcel PW20A. The second four-o'clock population in the Imnaha River canyon, the Fall Creek site, straddles both private and FS lands, with about half of the site occurring on FS land. Thus, no more than 25% of the MacFarlane's four-o'clock known to occur in the Imnaha River Canyon is located on NFS lands that fall under the umbrella of protections afforded to threatened plants by the Endangered Species Act, the Forest Plan (FP), and the HCNRA CMP.

The Buck Creek site occupies a steep rocky slope above the Imnaha River. The population contains an estimated 200 ramets of the four-o'clock plant. A ramet is one distinctly separable stem or clump belonging to a colony-forming plant species. Barnes (1996) estimated that one MacFarlane's four-o'clock genetic individual (or genet) averages 4.88 ramets. Based on Barnes' findings, the Buck Creek population is estimated to hold about 40 genetic individuals or genets.

A predictive model for MacFarlane's four-o'clock habitat (Murray 2001) identified 25.5 acres of high or moderate potential habitat in Federal parcels FW21, FW25A, and FW26. Dr. Steven Brunsfeld of the University of Idaho surveyed these parcels for the presence of MacFarlane's four-o'clock, but no plants were found. The PR contains the complete reports of these surveys. The predictive model also identified 875 acres of high and moderate potential habitat in privately owned parcels PW10A, PW10B, PW11, PW13A, PW13B, PW13C, PW13D, PW16A, PW16B, PW16C, PW16E, PW17B, PW19C, PW20A, PW20C, PW22, PW24A, PW24B, PW24C, PW24D, PW24G, PW25A, PW25B, PW25D, PW25E, PW27A, PW27C, PW2A, PW2B, PW2C, PW3, PW4, PW48, PW5, PW8A, and PW8B. These parcels have not been inventoried, so the presence or absence of MacFarlane's four-o'clock in private parcels (other than parcel PW20A) cannot be confirmed.

The private parcels to acquire in the Proposed Land Exchange that contain rare plant sites and one threatened species site are listed below in Table 47. The population size and the proportion of the population area located within each parcel are displayed. The three columns on the right of Table 47 display parcels that would be acquired by action alternatives.

Table 47. Rare/Threatened Plant Sites on Land to Acquire/purchase

Parcel	Species	Pop. Size	% Pop Area[1]	Remarks	Alt. 1	Alt. 3	Alt. 4
PW1	*Allium geyeri var. geyeri*	No Data	<5	HCNRA – Disjunct species	X	X	X
PW6					X	X	X
PW10A	*Carex hystericina*	4	100	HCNRA	X	X	X
PW10B					X	X	X
PW16E	*Carex hystericina*	200	100	HCNRA	X	X	X
PW17A	*Carex hystericina*	4	100	HCNRA	X		X
PW20A	*Mirabilis macfarlanei*	200	98	HCNRA - Federal Threatened Species	X	X	X
PW20B	*Carex hystericina*	No Data	100	HCNRA	X	X	X
PW23B	*Carex hystericina*	No Data	50	HCNRA	X	X	X
PW35B	*Platanthera obtusata*	No Data	10	On private land within Eagle Cap Wilderness	X		X
PW35C					X		X
PW46	*Phlox multiflora*	4,400	20 40 5	Three different patches overlap parcel PW46. La Grande RD.	X		X
PW47A	*Castilleja fraterna*	No Data	5	On private land inside Eagle Cap Wilderness	X	X	X
PW47B					X	X	X

1) Percent population Area: This figure represents the percent or proportion of the rare plant site that falls within the land exchange parcel. In some cases, less than 100 percent of the population is located within a given parcel. Where this occurs, the remaining proportion of the rare plant site is located on surrounding NFS lands.

Environmental Consequences

The environmental consequences to rare/threatened plants anticipated from the action alternatives were determined by comparing the number and size of these plant sites to convey to the number of these sites on privately owned parcels to acquire. Because this action does not compel any subsequent ground disturbing actions, but rather transfers deeds of affected parcels, comparing the number and size of rare plant sites acquired versus those transferred to private ownership provides a simple measure of the direct effect of this action. In some instances, only a portion of a given plant site is included within a parcel because of overlapping boundaries. The relative contribution of each rare/threatened plant site to the species' viability, to the extent such information is known, is included as part of this discussion.

Alternative 1: Proposed Exchange

Because field surveys did not detect the following Federally listed plant species it is assumed NF parcels to convey do not contain these species or their occupied habitat; this project would have no effect to these species: *Howellia aquatillis* (Water Howellia), *Spiranthes diluvialis* (Ute ladies'tresses), *Silene spaldingii* (Spalding's Catch-fly), and *Thelypodium howellii* var. *spectabilis* (Howell's Spectacular Thelypody).

Mirabilis ***macfarlanei*** (MacFarlane's Four-O'clock)

The direct and indirect effects of acquiring PW20A would result in MacFarlane's four-o'clock at the Buck Creek site being placed under the laws and policies that guide management of the HCNRA and the Wallowa-Whitman NF, including the Endangered Species Act. Currently, no legally required regulatory mechanisms exist to protect threatened plants on private lands, because the Endangered Species Act (ESA) does not mandate conservation of listed plants that inhabit privately owned lands. Under Federal stewardship, however, this MacFarlane's four-o'clock site would be subject to Section 7 of the ESA, the Wallowa-Whitman NF Land and Resource Management Plan, and the HCNRA CMP. Section 7 of the ESA will require the FS to consult with the USFWS on actions that may affect the four-o'clock at this site. Further, the ESA will require the FS not to engage in actions that would jeopardize the continued existence of this or any other threatened or endangered plant. Under Federal stewardship, then, regulatory mechanisms would be in place, where none currently exist.

With the MacFarlane's four-o'clock site managed as a Federal resource, actions later taken by the Wallowa-Whitman NF in the HCNRA would not be likely to adversely affect this plant. The Record of Decision for the HCNRA CMP determined that the goals, objectives, standards, and guides in this plan were not likely to adversely affect the MacFarlane's four-o'clock, a finding that received written concurrence from the USFWS (Gary Miller, USFWS, May 28, 2003 letter to Karen L. Wood, Forest Supervisor).

Acquisition of parcel PW20A would triple the amount of occupied MacFarlane's four-o'clock habitat under Federal stewardship known to occur in the Imnaha River canyon. Currently, 25% of the occupied habitat is under FS management, an amount that would increase to 75% with Alternative 1. This increase would benefit MacFarlane's four-o'clock by providing the regulatory mechanisms, described above, to maintain viable populations and secure from threats in the Imnaha River Canyon; one of the three geographic areas important to the recovery of the species (USFWS 2000). The Revised Recovery Plan for MacFarlane's Four-O'clock sets criteria before delisting of the species will be considered. These criteria include:

- A minimum of 11 populations are secure from threats, with stable or increasing populations trends;
- Population sizes are above the minimum necessary to maintain the viability of the species;
- Populations of MacFarlane's four-o'clock occur throughout its current range in each of three geographic areas: the Snake, Salmon, and Imnaha River canyons; and
- Management practices reduce and control threats.

Currently, the 25% of MacFarlane's four-o'clock occupied habitat now under Federal stewardship in the Imnaha River canyon is not likely sufficient to ensure the viability of this species in this area. The conservation of this plant presently must rely on the cooperation of landowners who hold deeds to the two four-o'clock sites in the Imnaha River canyon. The Recovery Plan for MacFarlane's four-o'clock (Task 1.3) seeks, at a minimum, the voluntary cooperation of landowners to conserve MacFarlane's four-o'clock habitat through conservation easements and deed restrictions on private lands. At present, conservation easements, deed restrictions, and habitat conservation plans have not been established with the private landowners in the Imnaha River canyon. The Recovery Plan also identifies direct acquisition of populations as a means to

protect MacFarlane's four-o'clock on private lands. This alternative's acquisition of the Buck Creek MacFarlane's four-o'clock site would accomplish one task in the Recovery Plan and increase to 75% the amount of occupied habitat in the Imnaha River canyon under Federal stewardship.

Cumulative effects are the combined effects of past, present, and reasonably foreseeable future actions when added to effects of the proposed action. Past and present actions that may have affected the Buck Creek MacFarlane's four-o'clock site consist mainly of a long history of livestock grazing dating to the latter 19th century. Observers have reported several "well-used" cattle trails coursing through the Buck Creek four-o'clock site, but cattle have not been observed to graze the plant itself. Livestock may have caused trampling impacts, which include soil compaction, soil shearing, and the exposure and subsequent shearing by hooves of the plant's rhizomes; impacts which have been observed at other MacFarlane's four-o'clock sites. The historical trend of the plant at this site is not known. Although impossible to quantify, past and present private grazing at this site has likely impacted individual four-o'clock plants to some degree.

Reasonably foreseeable future actions include management actions that would be undertaken according to the goals, objectives, standards, and guidelines found in the FP and the HCNRA CMP. Future actions that potentially may affect MacFarlane's four-o'clock would be analyzed in consultation with the USFWS. One reasonably foreseeable future action is livestock grazing in the Log Creek Allotment. The Buck Creek four-o'clock site is located on a private inholding within the Packsaddle Pasture of the Log Creek Cattle Allotment, which is administered by the Wallowa-Whitman NF. The four-o'clock site is located on private land in the northeast portion of the Packsaddle pasture, which will likely become part of the Log Creek Allotment with the acquisition of FW20A. The season of livestock use for the Packsaddle pasture follows this schedule:

April 1 – 10: 75 pairs permitted
April 11 – 20: 50 pairs permitted
April 21 – 30: 225 pairs permitted
May 1 – 10: 247 pairs permitted
May 11: livestock move out of the Packsaddle pasture until the following year.

Future grazing under Federal administration would likely continue to adversely affect the MacFarlane's four-o'clock, particularly if grazing continued under the present scheduled season of use. Once acquired, however, the annual operating plan and grazing permit could be modified to ensure livestock grazing did not adversely affect MacFarlane's four-o'clock.

Acquisition of parcel PW20A would potentially beneficially affect the MacFarlane's four-o'clock because the site at this location would be managed to standards and guides in the FP and HCNRA CMP, where now no legal requirements to conserve the species exist. Subsequent FS management of the Buck Creek MacFarlane's four-o'clock site under the auspices of the HCNRA CMP may affect, and in some circumstances, would not adversely affect MacFarlane's four-o'clock.

Sensitive Vegetation Species

The direct effect of exchanging lands between the FS and private parties would be to shift to private management one rare plant site (*Mimulus clivicola*) and to bring under FS management all or portions of at least eleven rare plant sites (see Table 47).

Mimulus clivicola
The conveyance of parcel FW8 would result in *Mimulus clivicola* no longer being managed according to the FP and HCNRA CMP, which gives direction to maintain viable populations of rare and endemic plants. While it is somewhat speculative to predict the fate of this rare plant site once in private ownership, grazing is a traditional use in this area along the Imnaha River bottomlands. The site is currently located in a vacant grazing allotment, and so direct observations of livestock behavior in this area have not been possible. This site occupies a moderately steep slope (40%) therefore livestock may not graze in this area to the degree they would valley bottomland. Because this site represents less than 2% of the known *Mimulus clivicola* populations on the Wallowa-Whitman NF, it's contribution to the overall viability of the species is probably not important. Regardless of this site's fate once in private ownership, the conveyance of parcel FW8 may indirectly impact individuals, but would not be expected to cause a loss of species or population viability to *Mimulus clivicola*.

Carex hystericina, Platanthera obtusata, Phlox multiflora, Castilleja fraternal
Through acquisition of parcels PW10A, PW10B, PW16E, PW17A, PW20B, PW23B, PW35B, PW35C, PW46, PW47A, and PW47B, *Carex hystericina* (5 patches), *Platanthera obtusata* (1 patch), *Phlox multiflora* (3 patches), and *Castilleja fraterna* (1 patch) would be brought under Federal stewardship and managed according to the Forest Plan and the HCNRA CMP. The *Castilleja fraterna* site would increase from 95% to 100% Federal management and the *Platanthera obtusata* patch would increase from 90% to 100% Federal management. These are not significant increases in Federal management of these rare plant sites, but overall would benefit each species, if only slightly. Both *Castilleja fraterna* and *Platanthera obtusata* are located in the Eagle Cap Wilderness Area and thus would be managed according to wilderness legislation and the Forest Plan standards and guidelines for the Eagle Cap Wilderness. The goal of wilderness management is to preserve the natural condition and characteristics of designated lands (LRMP 4-2).

The acquisition of PW46 would increase the proportion of three *Phlox multiflora* patches in a metapopulation of twelve patches under FS management in this area. The gained portions of these sites by the FS would subtly benefit *Phlox multiflora* because these patches would be managed according to FP standards and guides, which require maintaining viable populations of sensitive plant species.

The acquisition of parcels containing *Carex hystericina* would benefit the species because many of the known occurrences of this plant in the Imnaha River canyon currently inhabit private lands. Adding these parcels to the NFS would add 5 more sites of this species that would be managed according to the HCNRA CMP, thereby helping to maintain viable populations of this plant.

Castilleia fratema and Platanthera obtusata may experience an indirect or cumulative beneficial impact because these sites would be managed for wilderness values. Neither species occurs on lands that would become part of an active grazing allotment.

Cumulatively, present grazing would continue to be managed to the same standards as in the FP and HCNRA CMP; therefore, no net change in effects to *Carex hystericina* and *Phlox multiflora* would result from grazing following the FS's acquisition of the parcels containing these sites. The overall cumulative effect of bringing these two plant species under FS management *may impact individuals or habitat, but would not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.*

Allium geveri var. geveri
Two small portions that amount to less than 5% of one large *Allium geyeri var. geyeri* site are located in parcels PW1 and PW6. These parcels both occur within the Cherry Creek Allotment. Currently, the private lands where this plant is located have been waived to the FS for grazing administration. Once acquired, these lands would continue to be managed according to the terms and conditions of the permits issued for these grazing allotments and their associated annual operating plans. The effect of bringing this species under FS management would only subtly benefit *Allium geyeri var. geyeri.* Future actions managed under the standards and guidelines in the HCNRA CMP *may impact individuals or habitat, but would not likely contribute to a trend toward Federal listing or cause a loss of viability to this population or species*.

Alternative 2: No Action

Under the No Action Alternative the existing conditions described in "Affected Environment" would not change. Present NF parcels would continue under FS management. One rare plant site (Table 47) would not transfer to private ownership, and at least 11 rare plant sites, or portions thereof, would not transfer to FS management. Seventy five percent of the known occupied habitat of the threatened MacFarlane's four-o'clock in the Imnaha River canyon would continue to exist principally on private lands, where no regulatory oversight exists for the species' recovery. The population trends of the sites on private parcels are not known. Non-FS personnel at the Oregon Heritage Information Center have reported the only information available on these sites. Therefore, regardless of past use and any anticipated future use, the FS lacks the information necessary to draw any reasonable conclusions about the fate of these sites if they remain in private ownership. Any effort to do so would be highly speculative. What can be said with certainty is that, under private ownership, regulatory protections do not exist to protect or conserve these sites. That does not necessarily mean these plant sites are doomed to local extinction, but as with the action alternatives, they are more likely to be conserved under FS management because the agency has a mandate to provide for viable populations of these species.

Alternative 3: Purchase

Mimulus clivicola
Under this alternative, the FS would purchase the private parcels displayed in Table 47. No parcels would be conveyed to the private, thus the FS would continue to manage the *Mimulus clivicola* site in parcel FW8 according to FS policy and legal mandates. This site represents less than 2% of the known sites on the Wallowa-Whitman NF.

Carex hystericina, Platanthera obtusata, Phlox multiflora
Through the purchase of the private parcels, the FS would acquire fewer plant sites than Alternative 1. One small *Carex hystericina* site (parcel PW17A) that holds just four plants, 10 percent of one *Platanthera obtusata* site in the Eagle Cap Wilderness Area (Parcels PW35B and PW35C) and portions of the three *Phlox multiflora* sites would remain in private ownership.

Allium geyeri var. geyeri, Carex hystericina, Castilleja fraterna, Mirabilis macfarlanei
For *Allium geyeri var. geyeri*, *Carex hystericina, Castilleja fraterna*, and *MacFarlane's four-o'clock* the effect of Alternative 3 is the same as for Alternative 1. These species would be managed according to the standards and guidelines found in the FP and the HCNRA CMP. For all rare and endemic plants, the EIS for the HCNRA CMP found that the adopted standards and guides *"may impact individuals or habitat, but would not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species"* (FEIS, page 3-286).

Alternative 4: Deed Restriction

Mimulus clivicola

The affected environment for threatened, sensitive, rare, and endemic plants in Alternative 4 is the same as described in Alternative 1 because the acquired parcels known to harbor these plants do not differ between Alternative 1 and Alternative 4. Alternative 4 differs from the proposed action with the incorporation of deed restrictions on conveyed parcels. Under Alternative 4, the *Mimulus clivicola* site in parcel FW8 would likely move from a state of not being grazed to one that may be grazed in the future. However, Parcel FW8, which contains the *Mimulus clivicola* site, would carry a deed restriction that requires the owner to manage the land according to the grazing standards for the Wallowa-Whitman NF and the HCNRA CMP. Because this site may provide limited access to livestock, this point may be moot. *Mimulus clivicola may impact individuals or habitat, but would not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.*

Noxious Weeds

The objective of this section is to disclose by alternative the acres of noxious weeds present on proposed parcels to convey and acquire. Since the action alternatives do not compel any subsequent ground disturbing actions related to weeds, comparing the number and size of noxious weed sites acquired versus those conveyed provides one indicator measure of alternative effects. In addition, the cost of managing noxious weeds will be used as another indicator measure for comparison of alternatives.

Affected Environment

Plant species considered in this analysis consist of state designated noxious weeds present on lands considered for exchange. The presence of weeds was determined by existing inventories as mapped in the Forest GIS database for noxious weeds. Table 48 displays acres by alternative of noxious weeds where such information exists on exchange parcels.

Table 48. Acres of Noxious Weeds Present in Land Exchange Parcels

	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Acres To Convey	54	54		54
Acres To Acquire	910		294	858

Environmental Consequences

Noxious weed sites acquired would be managed according to the Land and Resource Management Plans for the Wallowa-Whitman, Malheur, and Umatilla National Forests and the HCNRA Comprehensive Management Plan (CMP). Noxious weed management results in a fiscal liability associated with the net change of acres of inventoried noxious weeds present on acquired parcels. Refer to Table 49 for a comparison of fiscal liability by alternative. The costs to manage noxious weed sites average approximately $125 per acre per year. For example, if the FS had a net increase of 100 acres of noxious weeds for a given alternative, then it would assume an additional $12,500 per year liability to manage the additional acres of weed sites.

Table 49. Noxious Weed Management Fiscal Liability in Land Exchange Parcels

	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Net weed Increase (acres)	856	0	294	804
Additional Cost to FS (1yr)	$107,000	0	$36,750	$100,500

Alternative 1: Proposed Exchange

The Proposed Land Exchange would result in the conveyance of parcels that have 54 acres of inventoried noxious weeds and the acquisition of parcels with 910 acres of mapped noxious weeds. This alternative would result in a net increase of 856 acres of noxious weeds on NFS lands in the project area. At a cost of $125 per acre to manage the increased noxious weed sites, $107,000 would be a fiscal liability. Over a 10-year period, the figure could exceed $1,000,000, but would likely be somewhat less as active management would decrease the amount of acres occupied by noxious weeds.

Alternative 2: No Action

Under this alternative, noxious weed sites would not be acquired and managed according to FS policy, therefore no change in fiscal liability would occur. The FS would continue to manage the 54 acres of noxious weed sites on lands proposed to convey under Alternative 1.

Alternative 3: Purchase

Under this alternative, the FS would purchase identified privately held parcels. The increase in acres of noxious weeds that would require management by the FS would be 294 acres. The weed management liability would be $36,750 per year. Over a 10-year period, the cost could rise to over $367,500, but would likely be somewhat less as active management would decrease the amount of acres occupied by noxious weeds.

Alternative 4: Deed Restriction

The effects of this alternative would be quite similar to Alternative 1. The FS would acquire a net increase of 804 acres of noxious weeds. The weed management liability would be $100,500 per year. Over a 10-year period, the cost could rise to over $1,000,000, but would likely be somewhat less as active management would decrease the amount of acres occupied by noxious weeds.

Range

The objective of this section is to describe by alternative the likely management changes to existing allotments. In addition, probable changes in range health by alternative will be described in general terms. The analysis area for range includes the exchange parcels and all range allotments that have exchange parcels located within their boundaries.

Laws and Regulations Applying to the Analysis

The pertinent laws include: 1) Bankhead-Jones Farm Tenant Act; 2) P.L. 75-210; Department of Agriculture Organic Act of 1944 P.L. 78-425; 3) Granger-Thye Act P.L. 81-478; 4) Multiple Use-Sustained Yield Act 1960, P.L. 86-517; 5) Environmental Quality Act of 1970, P.L. 91-224; 6) Forest and Rangeland Renewable Resources Planning Act of 1974; and 7) Public Rangelands Improvement Act of 1978, P.L. 95-514.

Affected Environment

Livestock use on NFS lands is only authorized through a grazing or livestock use permit [26 CFR 222.3(a)]. Allotments are designated on NFS lands and other offered lands with the owners consent to form logical grazing management units [36 CFR 222.2(a)]. The FS has designated grazing allotments within the project area on all three forests and has permitted livestock with management prescribed through grazing permits, forest plan direction, as amended, allotment management plans (AMP), and annual operating instructions. Refer to the Range Specialist Report in the PR for a description of the three types of grazing permits issued by the FS. To control and distribute livestock within allotments, the FS and permittees cooperatively finance, install, and manage livestock improvements. The improvements are amortized over a 30-year period. Although these improvements are often functional after 30 years, the FS recognizes no value in them.

There are private lands separate from Federally managed allotments in the analysis area. Management prescriptions on these lands would vary depending upon the owner's objectives. Some private parcels have winter-feeding operations, irrigated pastures, and/or open range. The landowner finances facilities and improvements placed on private lands.

Within the analysis area, livestock grazing occurs on forested lands, shrub lands, and grasslands. Though livestock graze on a multitude of environments and topographies, they display preferences to certain areas or locations. Livestock preference can be influenced by the amount, type, and nutritional value of forage, distance from water, percent slope, amount of canopy cover, etc (FSH 2209.21). Also, livestock learned experiences will contribute to distribution and forage preference. A manager can modify livestock behavior with salting, riding and herding, fencing, and other cultural practices. The intensity of livestock use will vary across the landscape depending on the physical, environmental, and cultural influences.

The health of rangeland vegetation and soils condition in the analysis area is variable. The FS classifies range health as satisfactory or unsatisfactory and uses a multitude of tools to determine vegetative health associated with permitted livestock activities. The three Forest Plans require rangelands to be managed in a satisfactory condition and assign standards and guidelines that are incorporated into grazing permits. The HCNRA Comprehensive Management Plan has a specific set of grazing standards and guidelines. The FS determines the number and seasons of livestock use based upon existing environmental conditions within allotments. Therefore, non-Federal lands within allotment boundaries typically represent range health conditions on NFS lands.

Environmental Consequences

Changes in land management objectives resulting from a change in ownership can indirectly affect the health of the range resource within the project area. This analysis has identified a combination of four situations that may result from the action alternatives. They include: 1) Parcels are conveyed that are currently within an allotment; 2) Parcels are acquired that are currently within an allotment; 3) Parcels are acquired that are currently outside an allotment; and 4) Parcels are conveyed that are currently outside an allotment and are likely to be grazed in the future.

This analysis identifies how each action alternative would likely affect the management of livestock operations, livestock stocking, and facility ownership. In addition, anticipated general

range health by alternative within affected allotments and on exchange parcels outside of allotments will be discussed.

Additional discussions concerning the impacts from livestock activities can be found in other resource sections of this Draft EIS. For this information refer to the effects analysis in the soils, hydrology, plants, wildlife, and social and economic environment sections.

Alternative 1: Proposed Exchange

Alternative 1 proposes to acquire 141 parcels representing 24,143 acres within 53 existing allotments. This alternative would convey 62 parcels representing 15,450 acres within existing allotments.

Table 50 displays the distribution of acquired and conveyed parcels and parcel acreage by allotment for each Forest and Ranger District.

Table 50. Alternative 1 Distribution of Acquired and Conveyed Parcels by Allotment

Allotment	Parcel	Acres
Aldrich	PM28	161
	PM29	44
Murderers Creek	PM21	146
	PM25	161
	PM26	160
	PM27	159
	PM30	641
	PM31	160
Beech Creek	FM12	236
	FM13	317
Blue Mountain	PM1	33
	PM2	280
Deer Creek	FM16A	246
	FM16B	82
	FM18	480
	FM19	309
	FM20	41
	PM23	241
	PM24	159
Dixie	FM3	121
	FM4	368
	FM5	326
	FM6	302
	FM7[1]	322
	FM8	581
	PM6	124
	FM9[2]	398
Hamilton	FM15	325
	FM17	596
	FM21	241
King	FM14	80
Long Creek	PM7	163
Mt. Vernon/	PM11	328
	PM12	161
	PM13	161
	PM14	314
	PM15	80
	PM16	124
	PM17	162
	PM18	481
	PM19	623
	PM20	483
	PM8A	39
	PM8B	109
	PM9	158
	FM11[3]	64
Roundtop	FM10	314
Upper Middle Fork	PM4	40
Hot Springs	FM2	16
Sullens	PM3	160
Coalmine	FU26	189
Hardman	PU22A	1080
Tamarack Monument	FU27	102
	FU28	38
	PU23	465
	PU24	161
Cooper Creek	FU19A	158
	FU19B	157
	FU20A	403

Table 50. Alternative 1 Distribution of Acquired and Conveyed Parcels by Allotment (continued)

Allotment	Parcel	Acres
Cooper Creek (continued)	FU20C	40
	FU20D	40
	FU22	37
	FU20B[4]	408
Cunningham	PU14	640
F.G.Whitney	FU21	319
Hutchison	FU23[5]	242
Indian Creek	PU20	390
Klondike	FU6B	45
	PU15	319
Lucky Strike	PU19	152
McDonald Spring	FU30	49
Trout Meadows	PU13	108
	PW45[6]	59
Butcher Creek	FU3A	710
	FU3B	658
	FU3C	557
	FU3D	874
	FU3E	643
	PU10A	247
	PU10B	240
	PU6	14
	PU7A	85
	PU7B	359
	PU7C	42
	PU8A	40
	PU8B	40
	PU8C	81
	PU9A	63
	PU9B	32
	PU11[7]	745
Eden	PU1A	230
	PU1B	521
	PU2	78
	PU3	238
	PU4	59
Dark Ensign	PW46	159
Five Points	PW42	21
McCarty	PW44B	12
Starkey	FW18	388
Cayuse	FW5	39
	PW26A	315
	PW26B	157
	PW26C	155
Cow Creek	PW3	564
	PW4	40
	PW48	233
	PW5	40
Dodson-Haas	PW10A	63
	PW10B	101
	PW11	41
	PW12	257
	PW13A	43
	PW13B	83
	PW13C	63
	PW13D	8
	PW14	649
	PW15A	187
	PW15B	87
	PW16A	39
	PW16B	115
	PW16C	302
	PW16D	80
	PW16E	162
	PW17A	118
	PW17B	399
	PW19A	21
	PW19B	201
	PW19C	162
	PW22	41
Grouseline	PW28	119
Log Creek	FW1D	325
	FW1E	127
	PW18	41
	PW20A	159
	PW20B	224
	PW20C	151
	PW21A	81
	PW21B	76
	PW21C	75
	PW21D	151
	PW23A	39
	PW23B	75
	PW50	464
Lone Pine	PW1	11
Middlepoint	PW24A	67
	PW24B	53
	PW24C	31
	PW24D	41
	PW24E	39
	PW24F	88
	PW24G	24
	PW24H	98

Table 50. Alternative 1 Distribution of Acquired and Conveyed Parcels by Allotment (continued)

Allotment	Parcel	Acres
Middlepoint (continued)	PW25A	186
	PW25B	65
	PW25C	180
	PW25E	74
	PW27A	80
	PW27C	127
Toomey	PW2A	22
	PW2B	37
	PW2C	2
	PW7A	83
	PW7B	244
	PW7C	118
	PW8A	429
	PW8B	258
	PW8C	39
Goose Creek	PW38	311
Snake River	PW29	143
Bullrun	FW19	42
Al-Cunningham	PW34A	237
	PW34B	279
	PW34C	142
Big Sheep	FW6A	42
	FW6B	38
	FW6C	43
	FW6D	43
	FW6E	38
	FW6F	41
	PW31	183
Buck Creek	PW39A	77
	PW39B	572
	PW39C	141
	PW39D	83
	PW40	163
Carrol Creek	FW9	422
Chesnimnus	PW30	162
	PW51D	78
	PW52	253
	PW51A	244
	PW51C	79
Divide	FW10	640
Doe Creek	PW33	161
Needham Butte	PW32	78
North	FW20	79
	FW21	83
	FW22	40
	FW23	40
	FW24	663
	FW25A	576
	FW25B	59
	FW26	247
South Powwatka	FW30	1

1) FM7 – Only seven acres in Dixie Allotment
2) FM9 - Dixie Allotment 83 acres & Roundtop Allotment 315 acres
3) FM11 - Mt. Veron/John Day Allotment 37 acres & Beech Creek Allotment 27 acres
4) FU20B - Cooper Creek Allotment 374 acres & Hutchinson Allotment 35 acre
5) FU23 - Hutchison 164 acres & Cooper Creek 78 acres
6) PW45 the Umatilla NF administers livestock use.
7) PU11 - Only 147 acres in Butcher Creek Allotment

In addition to the parcels in the above table, this alternative proposes to acquire 30 parcels representing 7,597 acres outside existing active allotments. This alternative would also convey 32 parcels representing 2,721 acres outside existing active allotments.

Table 51 identifies only the parcels and parcel acres outside of allotments in Alternative 1 that are either currently being grazed or are intended to be grazed.

Table 51. Parcels Outside Allotments Either Being Grazed or Intended to be Grazed

To Convey	Acres	To Acquire	Acres
FU15[NG]	39	PU22B[G]	545
FU16[NG]	164	PU22C[G]	157
FU17[NG]	80	PU5[G]	202
FU18[NG]	160	PU11A[G]	200
FU2[NG]	160	PU11B[G]	404
FU4 [NG]	321	PU12[G]	84
FU5 [NG]	57	PU11[G 1]	598
FW15[NG]	31	PW44A[G]	70
FW16[NG]	39	PW6[G]	9
FW2[NG]	82	PM5[G]	51
		PM[G 2]	156
		PM22[G]	41
Total Acres	1133	Total Acres	2517

1) PU11 contains 598 acres outside and 147 acres inside the Butcher Creek Allotment.
2) PM7 contains 156 acres outside and 7 acres inside the Long Creek Allotment.
G - Current owner indicates livestock grazing is occurring on these acquired parcels.
NG - New grazing is an intended activity on these conveyed parcels.

The anticipated management implication to existing allotments resulting from Alternative 1 is outlined in Table 52. The FS would cooperatively work with the permittees to further clarify and implement these administrative changes.

Table 52. Alternative 1- Management Implications to Existing Allotments

Allotment	Management Implications
Aldrich	No change in management
Murderers Creek	No change in management
Beech Creek	No change in management. Conveyed NFS lands on one pasture, adjust term on/off permit to reflect changes in land ownership. No change in stocking.
Blue Mountain	No change in management
Deer Creek	Adjust allotment boundary to exclude conveyed and include acquired parcels. No change in stocking.
Dixie	Adjust allotment boundary; reduce permit by 257 AUM.
Hamilton	1/2 of western pastures conveyed. Potential change in allotment boundary. No change in stocking.
King	Conveyed all NFS lands on allotment. Cancel term on/off permit. Loss of the 3 AUM authorized through the on portion of the permit.
Long Creek	No change in management
Mt. Vernon/John Day	No change in management
Roundtop	No change in management
Upper Middle Fork	No change in management
Hot Springs	No change in management

Table 52. Alternative 1- Management Implications to Existing Allotments (continued)

Allotment	Management Implications
Sullens	No change in management
Coalmine	No change in management
Hardman	No change in management
Tamarack Monument	No change in management
Cooper Creek	Conveyed all NFS land. Cancel term on/off permit. Loss of 62 AUM authorized through the on portion of the permit.
Cunningham	No Change in Management
F.G. Whitney	No Change in Management. Loss of 2 ponds “no value.”
Hutchison	Conveyed all NFS land on allotment. Cancel term on/off permit. Loss of 18 AUM authorized through the on portion of the permit.
Indian Creek	No change in management
Klondike	No change in management
Lucky Strike	No change in management
McDonald Spring	Conveyed all NFS land. Cancel term on/off permit for 6 AUM. Loss of one trough “no value”
Trout Meadows	No change in management
Butcher Creek	Conveyed all NFS land on 2 pastures. Acquire private on rest of allotment. Cancel term on/off permit. Increase term permit. There would be a total loss of 158 AUM (sheep) from the on portion of the permit. Loss of two ponds “no value”.
Eden	No change in management
Dark Ensign	No change in management
Five Points	No change in management
McCarty	No change in management
Starkey	Convey most NFS land on one pasture. Remove from allotment. Pasture removed from rotation. No change in stocking.
Cayuse	No change in management
Cow Creek	No change in allotment management but improvement in administration. There is a private feeding facility on PW48. Livestock feeding area discontinued and site is being restored.
Dodson-Haas	No change in allotment management but improvement in administration. There are private feeding facilities on PW10A & B and PW13B. Livestock feeding area discontinued and site is being restored.
Grouseline	No change in management
Log Creek	No change in management. There are private feeding facilities on PW20C. Livestock feeding area discontinued and site is being restored.
Lone Pine	No change in management
Middlepoint	No change in allotment management but improvement in administration. There is private winter feeding facilities on PW27C. Livestock feeding area discontinued and site is being restored.
Toomey	No change in management

Table 52. Alternative 1- Management Implications to Existing Allotments (continued)

Allotment	Management Implications
Goose Creek	No change in management
Snake River	No change in management
Bullrun	No change in management
Al-Cunningham	No change in management. There are private feeding facilities on PW34C. Livestock feeding area discontinued and site is being restored.
Big Sheep	No change in management
Buck Creek	No change in management. There are private feeding facilities on PW39B&C. Livestock feeding area discontinued and site is being restored.
Carrol Creek	Conveyed all NFS land west of Carol Creek. Cancel 42 AUM from term grazing permit. New owner does not intend to continue grazing.
Chesnimnus	No change in management
Divide	Conveyed most NFS land in one pasture. Cancel 64 AUM from term grazing permit. New owner does not intend to continue grazing.
Doe Creek	No change in management
Needham Butte	No change in management
North Powwatka	Conveyed most NFS lands. Cancel term on/off permit for a loss of 113 AUM from the on portion of the permit. The private owner plans to continue grazing.
South Powwatka	No change in management. Though this parcel is the only Federal land within a private land pasture. It is so small no capacity is given to it. FS would no longer manage pasture.

Acquisition of private lands within existing allotments would likely improve the ease of management. Improvements in administration would be realized through monitoring and fence and other structural improvement location. Improvements in cultural practices would be realized through salting, herding and gathering. The benefits of consolidated ownership should provide a small reduction in the costs of management along with a small benefit to the range land resources. Where private lands have been waived to the Government for control, such as through the issuance of a term private land grazing permit, this ease of management is already occurring.

Improved management can have an indirect positive affect on rangeland health through better distribution of livestock and implementation of allotment standards and guidelines. In rare cases, the current management on acquired private lands is not consistent with the goals and objectives of the allotment. Once acquired these lands would adopt the allotments goals and objectives and incorporate appropriate standards and guidelines. Under this alternative there would be 24,306 acres of acquired parcels and 15,450 acres of parcels being conveyed. There would be no change in management for 40 of the allotments affected by this action. Even though acquired parcels may add capacity to these allotments, there would be no increase in stocking until further analysis is conducted. The FS determines stocking capacity based on attainment or retention of satisfactory range conditions. On the 141 acquired parcels within allotments, livestock would be managed to Forest Plan standards and guidelines as applied in the term grazing permit, AMP, and annual

operating instructions. Following these standards would be sufficient to protect the forage vegetation and soil resources. Indirectly there would be an improvement of rangeland management. This improvement would be greatest where acquired lands are capable and suitable and where the FS has not issued a private land term grazing permit. The allotments most benefited are the Murders Creek, Mount Vernon/John Day on the Malheur, Butcher Creek and Eden on the Umatilla and Cayuse, Cow Creek, Dodson-Haas, Log Creek, Middlepoint, Toomey, Al-Cunningham, Buck Creek, and Chesnimnus on the Wallowa-Whitman.

In addition, there will be indirect benefits to range health where livestock management practices on acquired lands are inconsistent with the allotment's prescribed management. These management situations include feeding areas or gathering corrals. Gathering areas would be evaluated and a future decision made to determine if the future use is appropriate. Use of feeding areas has been discontinued by the private landowners and would not be re-established if these lands are acquired. Site restoration activities have been initiated and would be continued with appropriate analysis. Those lands where feeding areas have been discontinued include Log Creek, Cow Creek, Dobson Haas, Middlepoint, Al-Cunningham and Buck Creek Allotments located along the Imnaha River and Cow, Horse Joseph and Buck Creeks on the Wallowa-Whitman. The associated affects from soil loss, impacts to local vegetative health and water quality would improve to a near natural rate as prescribed by the allotment management planning.

The conveyance of 62 parcels within allotments would eliminate the need to administer five allotments effecting the cancellation of five grazing permits. In addition, the FS would no longer manage six pastures on five allotments. This would result in the reduction of FS grazing administration costs. There would be a direct effect loss of 4 ponds and one trough on conveyed lands. These improvements are on pastures or allotments that would be removed from FS administration. The facilities are still functional but have exceeded their amortized value. Through the cancellation or adjustments of permits, the FS would reduce permitted stocking by 723 AUM. All parties receiving these parcels, except for parcels FW9 (Carol Creek Allotment) and FW10 (Divide Allotment) have expressed an interest in continued livestock grazing. The FS plans on completing allotment environmental analysis on the majority of the affected allotments by 2010. The consolidation of allotment lands would improve the ability to monitor and prescribe range health standards. In addition, the consolidation of allotment ownership would aid in improving livestock management prescriptions.

Under this alternative, approximately 2,517 acres would be acquired that are outside of active allotments and are currently being grazed. Once acquired, livestock grazing would be discontinued on these lands. Range health varies from satisfactory to unsatisfactory on these acquired parcels with feeding areas contributing to most unsatisfactory conditions. These areas would improve over time. Refer to the soils section for additional information on feeding areas and impacts to the soils resource.

It is not feasible to predict what changes in management would occur on the conveyed rangeland parcels outside allotments. These conveyed lands totaling 1,133 acres would receive a multitude of management prescriptions depending on the objectives of the owner and availability to livestock. Consolidation of these lands should assist individual landowners in achieving their management objectives and provide opportunities to manage lands separate from FS control.

Alternative 2: No Action

Under this alternative, there would be no change from existing conditions. Existing management would continue on all FS allotments and on private land. There would be no change in land and facility ownership or livestock management and stocking. Both forest and private lands would continue to be fragmented resulting in continued complications to efficient grazing management.

There would be no change to the conditions affecting range health within allotments. NFS lands would still be managed to the standards and guidelines prescribed in the forest plan and implemented through the permit, annual operating instructions, and plan of operations. Stocking on allotments would be authorized by permit regardless of land ownership.

The FS would be completing allotment administrative environmental analysis on the majority of the affected allotments by 2010. Without the consolidation of NFS lands within allotments, management analysis would be more complex than under Alternative 1.

Alternative 3: Purchase

Alternative 3 proposes to purchase 34 parcels representing 3,699 acres within 11 existing allotments. This alternative conveys no parcels.

Table 53 displays the distribution of purchased parcels and parcel acreage by allotment for each Forest and Ranger District.

Table 53. Alternative 3- Distribution of Purchased Parcels by Allotment

Allotment	Parcel	Acreage
Trout Meadows	PW45[1]	59
Eden	PU1A	230
Cow Creek	PW48	233
Dodson-Haas	PW10A	63
	PW10B	101
	PW11	41
	PW13A	43
	PW13B	83
	PW13C	63
	PW13D	8
	PW16A	39
	PW16C	302
	PW16E	162
	PW19B	201
	PW19C	162
	PW22	41
Grouseline	PW28	119
Log Creek	PW20A	159
	PW20C	151
	PW21A	81
	PW21B	76
	PW21C	75
	PW21D	151
	PW23A	39
	PW23B	75
Lone Pine	PW1	11
Middlepoint	PW25A	186
	PW25B	65
	PW25C	180
	PW27C	127
Toomey	PW2A	22
	PW2B	37
Snake River	PW29	143
Buck Creek	PW39C	141

1) The Umatilla NF administers livestock use on PW45

Alternative 3 purchases an additional five parcels representing 580 acres outside active allotments. None of these parcels outside of allotments are currently being grazed.

The anticipated management implication to existing allotments resulting from this Purchase Alternative is outlined in Table 54. The FS would cooperatively work with the permittees to further clarify and implement these management actions.

Table 54. Alternative 3- Management Implications to Existing Allotments

Allotment	Management Implications
Trout Meadows	No change in management
Eden	No change in management
Cow Creek	No change in allotment management but improvement in administration. There is a private feeding facility on PW48. Livestock feeding area discontinued and site is being restored.
Dodson-Haas	No change in allotment management but improvement in administration. There are private feeding facilities on PW10A & B and PW13B. Livestock feeding area discontinued and site is being restored.
Grouseline	No change in management
Log Creek	No change in management. There are private feeding facilities on PW20C. Livestock feeding area discontinued and site is being restored.
Lone Pine	No change in management
Middlepoint	No change in allotment management but improvement in administration There is private winter feeding facilities on PW247C. Livestock feeding area discontinued and site is being restored.
Toomey	No change in management
Snake River	No change in management
Buck Creek	No change in management. There are private feeding facilities on PW39B&C. Livestock feeding area discontinued and site is being restored.

Purchase of private lands within existing allotments would likely improve the ease of management. Improvements in administration would be realized through monitoring and fence and other structural improvement location. Improvements in cultural practices would be realized through salting, herding and gathering. The benefits of consolidated ownership should provide a small reduction in the costs of management along with a small benefit to the range land resources. Where private lands have been waived to the Government for control, such as through the issuance of a term private land grazing permit, this ease of management is already occurring.

Improved management can have an indirect positive affect on rangeland health through better distribution of livestock and implementation of allotment standards and guidelines. In rare cases, the current management on acquired private lands is not consistent with the goals and objectives of the allotment. Once acquired these lands would adopt the allotments goals and objectives and incorporate appropriate standards and guidelines. Under this alternative there would be 3,669

acres of purchased lands. There would be no change in management for the allotments affected by this action but several allotments would have improved administration. Even though purchased parcels may add capacity to the allotment there would be no increase in stocking until further analysis is conducted. The FS determines stocking capacity based on attainment or retention of satisfactory range conditions. On purchased parcels within allotments, livestock would be managed to Forest Plan standards and guidelines as applied in the term grazing permit, AMP, and annual operating instructions. Following these standards would be sufficient to protect the forage vegetation and soil resources. Indirectly there would be an improvement of rangeland management. This improvement would be greatest where purchased lands are on capable and suitable and where the FS has not issued a private land term grazing permit. The allotments most benefited are the Cow Creek, Dodson-Haas, Log Creek, Middlepoint and Toomey on the Wallowa-Whitman.

In addition, there would be indirect benefits to range health where livestock management practices on purchased lands are inconsistent with the allotment's prescribed management. These management situations include feeding areas or gathering corrals. Gathering corrals would be evaluated and a future decision made to determine if there future use is appropriate. Use of feeding areas has been discontinued by the private landowners and would not be re-established if these lands are purchased. Site restoration activities have been initiated and would be continued with appropriate analysis. Those feeding areas that would be purchased and have been discontinued include Log Creek, Cow Creek, Dobson Haas, Middlepoint, and Buck Creek Allotments located along the Imnaha River and Cow, Horse and Buck Creeks on the Wallowa-Whitman. The associated affects from soil loss, impacts to local vegetative health and water quality would improve to a near natural rate as prescribed by the allotment management planning.

Alternative 3 purchases an additional five parcels representing 580 acres outside active allotments. None of the parcels outside of allotments are currently being grazed therefore, there would be no effects related to grazing on these parcels.

Summary- Alternative 3

The FS would improve grazing management within allotments where parcels are purchased. This alternative would block up Federal lands and improve the ability to manage the grazing resource. The benefits to the FS grazing resource would be less than Alternative 1 because Alternative 3 purchases considerably less range acres within allotments than Alternative 1 acquires. Alternative 1 also benefits the private landowner's ability to improve grazing management by conveying Federal parcels that allow consolidation of ownership, thereby improving the ability to manage the private grazing resource. The Purchase Alternative does not provide for consolidation of private grazing lands. Therefore, the FS would continue to administer all pastures or allotments and grazing permits under current administration. Alternative 3 provides less savings in administration costs than Alternative 1 since there would be minimal opportunity to reduce the administration of pastures or allotments and grazing permits. The FS plans on completing allotment environmental analysis on the majority of the affected allotments by 2010. The consolidation of allotment lands would improve the ability to monitor and prescribe range health standards and would aid in improving livestock management prescriptions, but Alternative 1 would accomplish more in this regard. There would be no direct loss of Federally owned range structure improvements under Alternative 3.

Alternative 4: Deed Restriction

Alternative 4 proposes to acquire 84 parcels representing 11,603 acres within 42 existing allotments. This alternative conveys 62 parcels representing 15,450 acres. It conveys the same parcels as Alternative 1.

Table 55 displays the distribution of acquired and conveyed parcels by allotment for each Forest and Ranger District.

Table 55. Alternative 4 Distribution of Acquired and Conveyed Parcels by Allotment

Allotment	Parcel	Acres
Beech Creek	FM12[8]	236
	FM13	317
Blue Mountain	PM2	280
Deer Creek	FM16A	246
	FM16B	82
	FM18[8]	480
	FM19[8]	309
	FM20	41
Dixie	FM3[8]	121
	FM4[8]	368
	FM5[1]	326
	FM6[8]	302
	FM7[8]	322
	FM8[8]	581
	FM9[2]	398
Hamilton	FM15	325
	FM17[8]	596
	FM21	241
King	FM14	80
Mt. Vernon/John Day	FM11[38]	64
Roundtop	FM10	314
Hot Springs	FM2	16
Coalmine	FU26	189
Tamarack Monument	FU27	102
	FU28	38
Cooper Creek	FU19A	158
	FU19B	157
	FU20A	403
	FU20C	40
	FU20D	40
	FU22	37
	FU20B[4]	408
F.G. Whitney	FU21	319
Hutchison	FU23[5]	242
Indian Creek	PU20	390
Klondike	FU6B	45
	PU15	319
McDonald	FU30	49

Allotment	Parcel	Acres
Spring		
Trout Meadows	PU13	108
	PW45[6]	59
Butcher Creek	FU3A[8]	710
	FU3B[8]	658
	FU3C	557
	FU3D	874
	FU3E	643
	PU6	14
	PU9A	63
	PU9B	32
	PU11[7]	147
Eden	PU1A	230
Dark Ensign	PW46	159
McCarty	PW44B	12
Starkey	FW18[8]	388
Cayuse	FW5	39
	PW26A	315
	PW26B	157
	PW26C	155
Cow Creek	PW3	564
	PW4	40
	PW48	233
	PW5	40
Dodson-Haas	PW10A	63
	PW10B	101
	PW11	41
	PW12	257
	PW13A	43
	PW13B	83
	PW13C	63
	PW13D	8
	PW14	649
	PW15A	187
	PW15B	87
	PW16A	39
	PW16B	115
	PW16C	302
	PW16D	80
	PW16E	162

Table 55. Alternative 4 Distribution of Acquired and Conveyed Parcels by Allotment (continued)

Allotment	Parcel	Acres
Dodson-Haas (continued)	PW17A	118
	PW17B	399
	PW19A	21
	PW19B	201
	PW19C	162
	PW22	41
Grouseline	PW28	119
Log Creek	FW1D	325
	FW1E	127
	PW18	41
	PW20A	159
	PW20B	224
	PW20C	151
	PW21A	81
	PW21B	76
	PW21C	75
	PW21D	151
	PW23A	39
	PW23B	75
Lone Pine	PW1	11
Middlepoint	PW24A	67
	PW24B	53
	PW24C	31
	PW24D	41
	PW24G	24
	PW24H	98
	PW25A	186
	PW25B	65
	PW25C	180
	PW25E	74
	PW27A	80
	PW27C	127
Toomey	PW2A	22
	PW2B	37
	PW2C	2
	PW7A	83
	PW7B	244
	PW7C	118
	PW8A	429
	PW8B	258
	PW8C	39
Snake River	PW29	143
Bullrun	FW19	42
Al-Cunningham	PW34A	237
	PW34B	279
	PW34C	142
Big Sheep	FW6A	42
	FW6B	38
	FW6C	43
	FW6D	43
	FW6E	38
	FW6F	41
	PW31	183
Buck Creek	PW39C	141
Carrol Creek	FW9	422
Chesnimnus	PW51D	78
	PW51A	244
	PW51C	79
Divide	FW10[8]	640
Needham Butte	PW32	78
North Powwatka	FW20	79
	FW21	83
	FW22	40
	FW23	40
	FW24	663
	FW25A	576
	FW25B	59
	FW26[8]	247
South Powwatka	FW30	1

1) FM7 – Only seven acres in Dixie Allotment
2) FM9 - Dixie Allotment 83 acres & Roundtop Allotment 315 acres
3) FM11 - Mt. Veron/John Day Allotment 37 acres & Beech Creek Allotment 27 acres
4) FU20B - Cooper Creek Allotment 374 acres & Hutchinson Allotment 35 acres
5) FU23 - Hutchison 164 acres & Cooper Creek 78 ac.
6) W45 the Umatilla NF administers livestock use.
7) PU11 - Only 147 acres in Butcher Creek Allotment
8) Parcels with deed restrictions

In addition to the parcels in the above table, this alternative proposes to acquire 19 parcels representing 5,516 acres outside existing active allotments. Alternative 4 would also convey 19 parcels representing 2,721 acres outside existing active allotments, the same as Alternative 1.

Table 56 identifies only the parcels and parcel acres outside of allotments in Alternative 4 that are either currently being grazed or are intended to be grazed.

Table 56. Parcels Outside Allotments Either Being Grazed or Intended to be Grazed

Conveyed Parcels	Acres	Acquired Parcels	Acres
FU15[NG]	39	PU22B[G]	545
FU16 [NG]	164	PU11[G 1]	598
FU17 [NG]	80	PW44A[G]	70
FU18 [NG]	160	PW6[G]	9
FU2 [NG]	160		
FU4 [NG]	321		
FU5 [NG]	57		
FW15 [NG]	31		
FW16 [NG]	39		
FW2 [NG]	82		
Total Acres	1133	Total Acres	1222

1) PU11 contains 598 acres outside and 147 acres inside the Butcher Creek Allotment.

The anticipated management implication to existing allotments resulting from Alternative 4 is outlined in Table 57. The FS would cooperatively work with the permittees to further clarify and implement these management actions.

Table 57. Alternative 4- Management Implications to Existing Allotments

Allotment	Management Implications
Beech Creek	No change in management. Conveyed NFS lands on one pasture. Adjust term on/off permit to reflect changes in land ownership. No loss in stocking. Applied deed restriction for nonuse season and utilization.
Blue Mountain	No change in management
Deer Creek	Adjustments in ownership but no change in management or stocking. Applied deed restriction for nonuse season and utilization.
Dixie	No change in management. Applied deed restriction for nonuse season and utilization.
Hamilton	1/2 of western pastures conveyed. Potential change in allotment boundary. Applied deed restriction for nonuse season and utilization. No change in stocking.
King	Conveyed all NFS lands on allotment. Cancel term on/off permit. Loss of 3 AUM from on portion of the permit.
Long Creek	No change in management
Mt. Vernon/John Day	No change in management
Roundtop	No change in management

Table 57. Alternative 4- Management Implications to Existing Allotments (continued)

Allotment	Management Implications
Hot Springs	No change in management
Coalmine	No change in management
Tamarack Monument	No change in management
Cooper Creek	Conveyed all NFS land. Cancel term on/off permit. Loss of 62 AUM from the on portion of the permit.
F.G.Whitney	No Change in Management. Loss of 2 ponds “no value.”
Hutchison	Conveyed all NFS land on allotment. Cancel term on/off permit. Loss of 18 AUM from the on portion of the permit.
Indian Creek	No change in management
Klondike	No change in management
McDonald Spring	Conveyed all NFS land. Cancel term on/off permit for 6 AUM from on portion of permit. Loss of one trough “no value”.
Trout Meadows	No change in management
Butcher Creek	Conveyed all NFS land on 2 pastures. Reduce term on/off permit. Total loss on allotment 158 AUM (sheep). Loss of two ponds “no value”. Applied deed restriction for nonuse season and utilization.
Eden	No change in management
Dark Ensign	No change in management
McCarty	No change in management
Starkey	Conveyed most NFS land on one pasture. Remove from allotment. Pasture removed from rotation. No change in stocking. Applied deed restriction for nonuse season and utilization.
Cayuse	No change in management
Cow Creek	No change in allotment management but improvement in administration. There is a private feeding facility on PW48. Livestock feeding area discontinued and site is being restored.
Dodson-Haas	No change in allotment management but improvement in administration. There are private feeding facilities on PW10A & B. Livestock feeding area discontinued and site is being restored.
Grouseline	No change in management
Log Creek	No change in management. There is a private feeding facility on PW20C. Livestock feeding area discontinued and site is being restored.
Lone Pine	No change in management
Middlepoint	No change in allotment management but improvement in administration. There are private winter feeding facilities on PW27C. Livestock feeding area discontinued and site is being restored.
Toomey	No change in management
Snake River	No change in management
Bullrun	No change in management

Table 57. Alternative 4- Management Implications to Existing Allotments (continued)

Allotment	Management Implications
Al-Cunningham	No change in management. There are private feeding facilities on PW24A & C. Livestock feeding area discontinued and site is being restored.
Big Sheep	No change in management. Applied deed restriction for nonuse season and utilization.
Buck Creek	No change in management. There are private feeding facilities on PW39C. Livestock feeding area discontinued and site is being restored.
Carrol Creek	Conveyed all NFS land west of Carol Creek. Cancel 42 AUM from term grazing permit. The new owner does not intend to continue grazing.
Chesnimnus	No change in management
Divide	Conveyed most NFS land in one pasture. Cancel 64 AUM from term grazing permit. The new owner does not intend to continue grazing. Applied deed restriction for nonuse season and utilization.
Needham Butte	No change in management
North Powwatka	Conveyed most NFS lands. Cancel term on/off permit. Loss of 113 AUM from the on portion of the permit. The private owner plans to continue grazing. Applied deed restriction for nonuse season and utilization.
South Powwatka	No change in management. This parcel is the only Federal land within a private land pasture. It is so small no capacity is given to it. FS would no longer manage pasture.

Acquisition of private lands within existing allotments would likely improve the ease of management. Improvements in administration would be realized through monitoring and fence and other structural improvement location. Improvements in cultural practices would be realized through salting, herding and gathering. The benefits of consolidated ownership should provide a small reduction in the costs of management along with a small benefit to the range land resources. Where private lands have been waived to the Government for control, such as through the issuance of a term private land grazing permit, this ease of management is already occurring.

Improved management can have an indirect positive affect on rangeland health through better distribution of livestock and implementation of allotment standards and guidelines. In rare cases, the current management on acquired private lands is not consistent with the goals and objectives of the allotment. Once acquired, these lands would adopt the allotments goals and objectives and incorporate appropriate standards and guidelines. Under this alternative, there would be 11,603 acres of acquired parcels and 15,450 acres of parcels being conveyed. There would be no change in management for 34 of the allotments affected by this action. Even though acquired parcels may add capacity to the allotment, there would be no increase in stocking until further analysis is conducted. The FS determines stocking capacity based on attainment or retention of satisfactory range conditions. On the 71 acquired parcels within allotments, livestock would be managed to Forest Plan standards and guidelines as applied in the term grazing permit, AMP, and annual operating instructions. Following these standards would be sufficient to protect the forage vegetation and soil resources. Indirectly there would be an Improvement of rangeland management. This improvement would be greatest where acquired lands are capable and suitable lands and where the FS has not issued a private land term grazing permit. The allotments most benefited are the

Eden on the Umatilla and Cayuse, Cow Creek, Dodson-Haas, Log Creek, Middlepoint, Toomey, Al-Cunningham, Buck Creek, and Chesnimnus on the Wallowa-Whitman.

In addition, there would be indirect benefits to range health where livestock management practices on acquired lands are inconsistent with the allotment's prescribed management. These management situations include feeding areas or gathering corrals. Gathering areas would be evaluated and a future decision made to determine if their future use is appropriate. Use of feeding areas has been discontinued by the private landowners and would not be re-established if these lands are acquired. Site restoration activities have been initiated and would be continued with appropriate analysis. Those lands where feeding areas have been discontinued include Log Creek, Cow Creek, Dobson Haas, Middlepoint, Al-Cunningham and Buck Creek Allotments located along the Imnaha River and Cow, Horse Joseph and Buck Creeks on the Wallowa-Whitman. The associated affects from soil loss, impacts to local vegetative health and water quality would improve to a near natural rate as prescribed by the allotment management planning.

The conveyance of 62 parcels within allotments would lead to reducing the need to administer one allotment affecting the cancellation of one grazing permit. In addition, the FS would no longer mange five pastures on four allotments. This likely would not result in the reduction of FS grazing administration costs because the FS would need to monitor for compliance of the five deed restrictions that apply to grazing on conveyed parcels. There would be a direct effect loss of 4 ponds and one trough on conveyed lands. These improvements are on pastures or allotments that would be removed from FS administration. The facilities are still functional but have exceeded their amortized value. Through the cancellation or adjustments of permits the FS would reduce permitted stocking by 404 AUM. All parties receiving these parcels, except for parcels FW9 (Carol Creek Allotment) and FW10 (Divide Allotment) have expressed an interest in continued livestock grazing. The FS plans on completing allotment environmental analysis on the majority of the affected allotments by 2010. The consolidation of allotment lands would improve the ability to monitor and prescribe range health standards. In addition, the consolidation of allotment ownership would aid in improving livestock management prescriptions.

Under this alternative, approximately 1,222 acres would be acquired that are outside of active allotments and are currently being grazed. Once acquired, livestock grazing would be discontinued on these lands. Range health varies from satisfactory to unsatisfactory on these acquired parcels with feeding areas contributing to most unsatisfactory conditions. The areas would improve over time. Refer to the soils section for additional information on feeding areas and impacts to the soils resource.

It is not feasible to predict what changes in management would occur on the conveyed rangeland parcels outside allotments. These lands totaling 1,333 acres would receive a multitude of management prescriptions depending on the objectives of the owner and availability to livestock although, the deed restrictions in this alternative would assist in maintaining or improving range health where required to address significant issues. Consolidation of these lands should assist individual landowners in achieving their management objectives and provide additional opportunities to manage lands but some management activities may be restricted due to FS monitoring for deed covenant compliance.

Summary- Alternative 4

The FS would improve grazing management within those allotments where parcels are acquired. This alternative would block up Federal lands within allotments and eliminate grazing on parcels acquired outside of active allotments. The total benefits to rangeland health may be more than Alternative 1 because of the required deed covenants on conveyed parcels outside of grazing allotments. Although, this benefit is somewhat offset by the FS acquiring considerably less acreage than Alternative 1, resulting in a lost opportunity for additional FS consolidation of land. Alternative 4 conveys the same amount of acres

as does Alternative 1, but the private land owners are somewhat restricted in management options due to the deed covenants applied to conveyed range land. FS monitoring of these deed covenants coupled with the lost opportunity for consolidation of lands within allotments would increase FS administrative costs over what would occur under Alternative 1.

Transportation

The objectives of this section are: 1) To describe the existing roads on all of the parcels under consideration; 2) to describe the effects of potential changes to motorized access under the action alternatives and; 3) to identify estimated deferred maintenance and annual maintenance costs associated with the roads affected by each action alternative; 4) To describe the effects of acquisition of private lands and conveyance of Federal lands on public access, and 5) to describe effects of the exchange on existing access agreements.

The analysis area includes all of the land within parcels that are being considered in the Proposed Land Exchange. It includes all of the existing roads that have been documented within the exchange parcels. Some discussion of roads outside the parcels is included if acquiring easements for those roads are necessary to allow road access to NFS lands.

On the parcels to convey, relatively good information about specific roads and road conditions is available. On State and private parcels to acquire, only limited information about specific roads and road conditions is available. This information was not detailed enough to conduct an interdisciplinary roads analysis. Consequently, the following assumptions were made for any roads where the FS would acquire jurisdiction through the Proposed Land Exchange:

- Any deferred road maintenance activities that are related to public safety, protection of cultural resources, protection of Threatened and Endangered Species, or related to providing functional drainage would be implemented as soon as possible following the proposed exchange.
- Other deferred road maintenance would be implemented within the first 10 years following the completion of the Proposed Land Exchange.
- Roads to be acquired that are currently closed for public access would remain closed.
- Roads to be acquired that are currently open for public access would remain open and maintained for High Clearance vehicles; exceptions to this would be made only for roads that need to be closed because of concerns related to public safety issues.
- The jurisdiction of State and Federal Highways and any FS roads that are currently maintained for passenger car use would not change, so any maintenance costs associated with those roads are not included in this section.
- Most problems identified in the field data sheets for roads on parcels that could potentially be acquired can be corrected by spot blading and constructing or installing drainage such as waterbars on closed roads and self maintaining structures such as drain dips and grade sags on roads to be left open. Spot rocking would be used in drain dips; grade sags and wet spots lacking drainage. Limited stream crossing information was available on road/stream crossings, so further field evaluations are needed at those locations. Appropriate analysis will be completed on those projects that require routine road maintenance on a site-specific basis.
- High clearance recreation road maintenance guidelines were used to determine deferred maintenance needs for all High Clearance roads that would be left open. The deferred maintenance needs were based only on administrative and recreational uses; additional road work and funding would be needed on most roads prior to commercial use.

- At some future date, the acquired roads would be subject to an interdisciplinary roads analysis, but this type of analysis is not likely to take place immediately following completion of the Proposed Land Exchange. The outcome of that analysis would determine long-term management strategies for the acquired roads, which could range from major improvements to decommissioning depending on the determined need for the road.

Other assumptions were necessary to address the effects of the land exchange on access across involved lands. Acquisition of some private parcels eliminates a need, and potential cost, to acquire roaded legal access across them. Conveyance of certain Federal lands eliminates the need, and potential cost, to acquire roaded legal access to them. In analyzing these effects the following assumptions were made:

- It is estimated that approximately 100 miles of FS system roads lacking easements cross parcels that could be acquired in the exchange. Access needs and costs were estimated only on those roads presently identified at present as needing legal right-of-way.
- While legal (not roaded) access may exist to some of the Federal parcels to be conveyed (across adjoining Federal lands) this assessment considers roaded, legal access.
- Where management prescription is for non-roaded access, trail considerations are described.
- Prescriptive rights may exist on some of the roads or trails crossing private lands to be acquired. However, these untested rights were not considered to be perfected. Acquisition of these parcels would eliminate any future actions that would potentially be necessary to perfect these rights.
- All private lands will be acquired with legal, roaded access.
- Roads crossing FS lands that could be conveyed, but still needed for access to adjoining Federal lands, would be reserved.

The Land Exchange Handbook, filed in the PR, directs Forest Supervisors to conduct an analysis of the effects and subsequent actions required as a result of a Proposed Land Exchange within a Road Right-of-Way Construction and Use Agreement (Cost Share) Area. The proposed Blue Mountain Land Exchange involves the exchange of Umatilla and Wallowa-Whitman NF lands that lie within the boundaries of the Boise Cascade-Umatilla and Boise Cascade-Wallowa-Whitman Road Right-of-Way Construction and Use Agreements and two Road Maintenance Agreements between the Umatilla National Forest and Pioneer Resources, LLC, dated May 9, 1995 and October 30, 1997. Cooperators to the above referenced potentially affected agreements are Boise Cascade Corporation and Pioneer Resources, LLC. The two Ageeements with Boise Cascade Corporation will be terminated in the near future since Boise Cascade Corporation sold all of their lands in these Agreement areas. Deferred maintenance obligations of Boise Cascade Corporation will be handled independent of this Proposed Land Exchange.

The Proposed Land Exchange involves lands located only in the State of Oregon, and therefore would not affect the Umatilla National Forest Memorandum of Agreement on Access with the Washington Department of Natural Resources.

Laws and Regulations Applying to the Analysis

Laws and regulations include: 1) FS Handbook 7709.58 – Forest Transportation Maintenance Handbook; 2) Highway Safety and Standards Act; 3) FS Manual 7700 – Transportation Systems and; 4) Draft Land Exchange Handbook, FSH 5409.13, 32.16.

Affected Environment

There are a wide variety of transportation systems and facilities in and near the exchange parcels. These include interstate highways, U.S. highways, State roads, county roads, NFS roads (arterial, collector, ad local) and private roads. Facilities located in or near the exchange parcels include electrical transmission lines, bridges, private structures, and railroads.

Roaded access to and across the exchange parcels depends on jurisdictional status of the roads. Some roads are open, some are not. Interstate Highways, State Highways and County Roads are open to the general public. Roads across Federal lands and FS system roads across private lands (where US has acquired easement) are open to the public at the discretion of the Secretary of Agriculture. Some FS system roads are closed to the public for a variety of reasons such as resource protection, public safety, road density guidelines, etc. On private or state lands involved in the exchange, unless the FS has acquired an easement, use by the public is by permission only and is totally at the discretion of the landowner.

There are 263 parcels being considered in the land exchange, including 94 NF parcels, 13 State owned parcels, and 156 privately owned parcels. Tables 88 and 89 have narratives describing access considerations and other related land uses for exchange parcels. All specific road information by parcel is stored in tables located in the PR. Eighty of the parcels have no existing roads. The roadless parcels include 41 NF parcels, 4 State-owned parcels, and 35 privately owned parcels. The 183 parcels that are roaded have a total of about 227 miles of road. Approximately 129 miles of the roads are currently open for public access, and approximately 98 miles are currently closed to public access.

The 53 NF parcels that are roaded have about 34 miles of open roads and 41 miles of closed roads. The 121 privately owned parcels that are roaded have about 87 miles of open roads, and 55 miles of closed roads. The nine roaded parcels under State ownership have about 8 miles of open roads and 3 miles of closed roads.

Within all the roaded parcels, approximately 121 road miles are within 300 feet of Class 1 through 4 streams (about 31 miles on NF parcels, 84 miles on private parcels, and 5 miles on State parcels). Within this same group of roads, approximately 71 road miles are within 150 feet of Class 1 through 4 streams (about 17 miles on NF parcels, 51 miles on private parcels, and 3 miles on State parcels).

The roads on NF parcels were usually constructed to FS standards (typically at least 12 feet wide), and have functional drainage, but some of the roads have some documented deferred maintenance needs. Based on available information, the roads currently under State and private jurisdiction on the State and private parcels were constructed to a variety of standards, so the road widths, drainage systems, and overall road conditions are highly varied. Many of the roads are less than 12 feet wide, and many are in need of drainage improvements and other deferred road maintenance activities.

All the roads that would potentially be acquired or conveyed through the Proposed Land Exchange are currently either open to High Clearance vehicles or closed by a Forest Order and/or a physical barrier (i.e. vegetation, locked gates, earth berms, blocked by cut or fill slopes, or other means). Most of these roads have low traffic volumes unless they are primary access roads or are associated with recreation activities like hiking trails or dispersed recreation site.

On roads that could potentially be acquired, the overall road surfaces are generally in good condition. The roads that do have problems are usually related to road segments that lack functional drainage, or where recent logging has occurred impacting road and drainage features. These roads are primarily located within a few select watersheds. The problem areas tend to be concentrated within 300 feet of streams and on short segments of roads with steep grades.

Environmental Consequences

The direct and indirect net effects to roads for each alternative will be expressed in terms of total road miles gained or lost, miles of open road that provide public motorized access for High Clearance vehicles gained or lost, miles of closed roads gained or lost, road/stream proximity on road miles gained or lost, and net changes in annual and deferred maintenance costs based on road miles gained or lost.

Available information related to road conditions and needed maintenance for a deferred maintenance cost on proposed acquired roads was limited to field data sheets. Cost estimates for closed roads include surface blading, constructing water bars, and in some cases reestablishing closure devices. Cost estimates for roads proposed to remain open for high-clearance vehicle use include surface blading, installing drain dips, grade sags, and installing culverts where erosion problems were identified at live stream crossings. Cost estimates for culverts documented as damaged are for repair or replacement with similar sized structures. The majority of the deferred maintenance costs are related to installing new drainage structures and reshaping the road surfaces. Some spot rocking of drainage structures and wet spots to correct the drainage problems are also included in the cost estimates.

For all of the roads that could potentially be acquired, the deferred maintenance costs were calculated to be approximately $105,000 (PR). Because those estimates were based on limited information and did not include overhead or contracting costs, actual total costs for completing the work are estimated to be in the range of $100,000 to $200,000. This range of values reflects the uncertainty of the actual work and the costs that might be needed. More detailed road condition surveys would be required to determine precisely what improvements are needed and the costs to do the improvements.

Calculated deferred maintenance cost estimates are higher on roads potentially acquired then on roads potentially conveyed, which is consistent with the assumption that the FS maintains system roads to higher standards than most private landowners.

The deferred maintenance cost estimates for roads that would potentially be conveyed were $363 per mile for closed roads, and $1,040 per mile for open, high-clearance roads. The costs used for open, high-clearance roads are based on 2004 maintenance contracts on the Malheur National Forest. The costs for closed roads were based on average deferred maintenance figures currently in the Malheur Forest INFRA database.

The estimated annual maintenance costs for acquired and conveyed roads were determined by comparing estimates from the Wallowa-Whitman and Malheur National Forest Road Managers. Closed roads were assigned a cost of $35 per mile, open (High Clearance) roads were assigned a cost of $245 per mile, and open (Low Clearance) roads were assigned a cost of $670 per mile.

The direct and indirect net effects to roads for each alternative are displayed in Table 58. A summary of estimated costs by forest is located in the PR.

Table 58. Roads Summary by Alternative

	Alt 1	Alt 2	Alt 3	Alt 4
Acquired (miles)	101	0	8	53
Conveyed (miles)	60	0	0	60
Net Gain or Loss (miles)	+ 41	0	+ 8	- 7
Reserved (miles)	10	0	0	10
Acquired Roads Closed for Safety (miles)	2.5	0	0	0
Acquired Deferred Maintenance Costs	$100,000 to $200,000	0	$2,000 to $4,000	$50,000 to $100,000
Acquired Annual Maintenance Costs	$14,523	0	$442	$6,150
Acquired Roads within 300 foot Stream Buffers				
Total Miles	56	0	5.5	33.2
Closed Miles	29	0	5.1	12.7
Open Miles	27	0	.4	20.5
Acquired Roads within 150 foot Stream Buffers				
Total Miles	35	0	3.4	19.9
Closed Miles	19	0	3.1	12
Open	16	0	.3	7.9

Effects Common to all Action Alternatives

Within the 183 roaded parcels considered in the Proposed Land Exchange, there are about 66 miles of road that are currently under County, State, Federal Highways or FS jurisdiction, where no changes in jurisdiction would occur under any of the alternatives. These road miles include reserved roads on NF parcels that would be conveyed with the exchange alternatives.

Any deferred road maintenance activities that are related to public safety, protection of cultural resources, or protection of Threatened and Endangered Species, or related to providing functional drainage would be implemented as soon as possible following implementation of any action alternatives. Closures of acquired roads that are currently open that have been identified as having public safety concerns would be implemented immediately after acquisition.

Other deferred road maintenance would be implemented within the first 10 years following acquisition.

Alternative 1: Proposed Exchange

Under this alternative, the FS would acquire jurisdiction over approximately 101 miles of road, and convey jurisdiction over about 60 miles of road, which would result in a net gain of about 41 miles of roads. The FS would reserve jurisdiction on approximately 10 miles of existing roads on conveyed parcels, to maintain access to other forest roads or lands. Approximately 2.5 miles of the acquired roads that are currently open have been identified as needing to be closed for public safety reasons.

The acquired roads include approximately 56 miles of roads within 300 feet of class 1 through 4 streams (29 miles of closed roads and 27 miles of open roads). Of these roads, approximately 35 road miles are within 150 feet of class 1 through 4 streams (about 19 miles of closed roads and 16 miles of open roads).

Total costs for all three forests are estimated to range from $100,000 to $200,000. Most of the potentially acquired roads in need of deferred maintenance work on the Malheur N. F. are located in the Beech Creek watershed. This type of work is mostly in the Wall Creek and Meacham Creek Watersheds on the Umatilla N. F., and most of this work is located in the Lower Imnaha River watershed on the Wallowa-Whitman N. F. The estimated cost of annual maintenance work on acquired parcels is approximately $14,523 (Table 58). A summary of estimated costs by forest can be found in the PR.

Estimated costs for acquiring rights-of-way to access public lands and acres accessed under Alternative 1 are displayed in Table 59.

Table 59. Alternative 1- R/W Acquisition Costs and Acres Accessed

Private Parcels with Identified Right-of-Way Need		
Parcel Number	**Estimated Cost to Acquire**	
PU1A&B	None	
PW39A&B	None	
PW47A&B	None	
PW38	None	
PW29	None	
PW1, 2A&B	None	
PU7B&C	None	
PU15	None	
PU19	None	
PU14	None	
PU23	None	
PM1	None	
Federal Parcels Lacking Access		
Parcel Number	**Estimated Cost to Acquire Needed Access**	**Acres Lacking Access**
FM2	None	16
FW9	None	422
FW20, 21 & 24	None	832
FW15&16	None	70
FW12	None	291
FU2, 3A-E, 5	None	3,659
FU7	None	35
FU15 & FU16	None	203
FU8, 9-14, 22, 30	None	374
FU17	None	80
Totals	None	5,982

The cost-share agreements with Boise Cascade Corporation will be terminated. Therefore, the Land Exchange will not effect this Agreement.

Pioneer Resources LLC would not be acquiring or granting lands as part of the Proposed Land Exchange but lands previously owned by Pioneer would be involved in all alternatives. The Umatilla National

Forest has not entered into maintenance agreements with Pioneer's successors in interest to these roads. Road maintenance obligations of the successors in interest are being handled on an "as used" or "as hauled" basis. The outstanding deferred maintenance obligations of Pioneer Resources have been satisfied via separate agreement. Cost share easements do encumber some of the lands proposed for acquisition by the United States. These easements would merge with title. Cost share easements previously granted by the United States on adjacent NFS lands to access these parcels have either been terminated via separate agreement with Pioneer Resources or would become mute, as they relate to the exchange parcels, when the FS acquires title. There are no costs or other effects associated with this Agreement to be considered.

Alternative 2: No Action

Under this alternative, no exchange or purchase of private parcels would occur. Changes to roads under FS jurisdiction would be subject to NEPA from another analysis of proposed management actions. Efforts towards achieving access to public lands would be continued in accordance with Forest Plan direction and budgets.

Estimated costs for acquiring rights-of-way to access public lands and acres accessed under Alternative 2 are displayed in Table 60.

Table 60. Alternative 2- R/W Acquisition Costs and Acres Accessed

Private Parcels with Identified Right-of-Way Need		
Parcel Number	**Cost Estimated to Acquire**	
PU1A&B	$10,000	
PW39A&B	$10,000	
PW47A&B	$10,000	
PW38	$10,000	
PW29	$10,000	
PW1, 2A&B	$10,000	
PU7B&C	$10,000	
PU15	$10,000	
PU19	$10,000	
PU14	$10,000	
PU23	$10,000	
PM1	$10,000	
Federal Parcels Lacking Access		
Parcel Number	**Estimated Cost to Acquire Needed Access**	**Acres Lacking Access**
FM2	$10,000	16
FW9	$10,000	422
FW20, 21 & 24	$20,000	832
FW15&16	$20,000	70
FW12	$50,000	291
FU2, 3A-E & 5	$20,000	3,659
FU7	$20,000	35
FU15 & FU16	$20,000	203
FU8, 9-14, 22, 30	$120,000	374
FU17	$30,000	80
Totals	$440,000	5,982

Alternative 2 would have no effect to cost share agreement areas.

Alternative 3: Purchase

Under this alternative, the FS would acquire jurisdiction over approximately 8 miles of road, and would not convey jurisdiction over any roads, which would result in a net gain of about 8 miles of roads. The FS would not need to reserve jurisdiction on any roads, to maintain access to other forest roads or lands. None of the acquired roads that are currently open have been identified as needing to be closed for public safety reasons.

The acquired roads include approximately 5.5 miles of roads within 300 feet of class 1 through 4 streams (5.1 miles of closed roads and .4 miles of open roads). Of these roads, approximately 3.4 road miles are within 150 feet of class 1 through 4 streams (about 3.1 miles of closed roads and .3 miles of open roads).

All three forests estimated costs of deferred maintenance work to mitigate existing road problems on acquired roads. They are in the range of $2,000 to $4,000. The estimated cost of annual maintenance work on purchased parcels is around $442 (Table 58). A summary of estimated costs by forest can be found in the PR.

Estimated costs for acquiring rights-of-way to access public lands and acres accessed under Alternative 3 are displayed in Table 61.

Table 61. Alternative 3- R/W Acquisition Costs and Acres Accessed

Private Parcels with Identified Right-of-Way Need		
Parcel Number	**Estimated Cost to Acquire**	
PU1A	None	
PU1B	$10,000	
PW39A&B	$10,000	
PW47A&B	None	
PW38	$10,000	
PW29	None	
PW1, 2A&B	$10,000	
PU7B&C	$10,000	
PU15	$10,000	
PU19	$10,000	
PU14	$10,000	
PU23	$10,000	
PM1	$10,000	
Federal Parcels Lacking Access		
Parcel Number	**Estimated Cost to Acquire Needed Access**	**Acres Lacking Access**
FM2	$10,000	16
FW9	$10,000	422
FW20, 21 & 24	$20,000	832
FW15&16	$20,000	70
FW12	$50,000	291
FU2, 3A-E & 5	$20,000	3,659
FU7	$20,000	35
FU15 & FU16	$20,000	203
FU8, 9-14, 22, 30	$120,000	374
FU17	$30,000	80
Totals	$420,000	5,982

The Malheur National Forest would have no purchased parcels, therefore no acquired roads. On the Umatilla N. F., there are no identified deferred maintenance needs to mitigate existing road problems on acquired roads. On the Wallowa-Whitman N. F., none of the acquired roads that are currently open have been identified as needing to be closed for public safety reasons.

Alternative 3 would have no effect to cost share agreement areas.

Alternative 4: Deed Restriction

Under this alternative, the FS would acquire jurisdiction over approximately 53 miles of road, and convey jurisdiction over about 60 miles of road, which would result in a net loss of about 7 miles of roads. The FS would reserve jurisdiction on approximately 10 miles of existing roads on conveyed lands, to maintain access to other forest roads or lands. None of the acquired roads that are currently open have been identified as needing to be closed for public safety reasons.

The acquired roads include approximately 33.2 miles of roads within 300 feet of class 1 through 4 streams (12.7 miles of closed roads and 20.5 miles of open roads). Of these roads, approximately 19.9 road miles are within 150 feet of class 1 through 4 streams (about 12 miles of closed roads and 7.9 miles of open roads).

All three forests estimated costs of deferred maintenance work to mitigate existing road problems on acquired roads. They are in the range of $50,000 to $100,000. The estimated cost of annual maintenance work on acquired parcels is around $6,150 (Table 58). A summary of estimated costs by forest can be found in the PR.

Since the Malheur Forest would not acquire new roads, there would be no deferred maintenance or annual maintenance work. Most of the potentially acquired roads in need of deferred maintenance work on the Umatilla N. F. are located in the Wall Creek and Meacham Creek Watersheds. Most of this work is located in the Lower Imnaha River watershed on the Wallowa-Whitman N. F.

Estimated costs for acquiring rights-of-way to access public lands and acres accessed under Alternative 4 are displayed in Table 62.

Table 62. Alternative 4- R/W Acquisition Costs and Acres Accessed

Private Parcels with Identified Right-of-Way Need		
Parcel Number	**Estimated Cost to Acquire**	
PU1A	None	
PU1B	$10,000	
PW39A&B	$10,000	
PW47A&B	None	
PW38	$10,000	
PW29	None	
PW1, 2A&B	None	
PU7B&C	$10,000	
PU15	None	
PU19	$10,000	
PU14	$10,000	
PU23	$10,000	
PM1	$10,000	
Federal Parcels Lacking Access		
Parcel Number	**Estimated Cost to Acquire Needed Access**	**Acres Lacking Access**
FM2	None	16
FW9	None	422
FW20, 21 & 24	None	832
FW15&16	None	70
FW12	None	291
FU2, 3A-E & 5	None	3,659
FU7	None	35
FU15 & FU16	None	203
FU8, 9-14, 22, 30	None	374
FU17	None	80
Totals	$80,000	5,982

Alternative 4 would have no effect to cost share agreement areas.

Fisheries

The objective of this section is to describe the various fisheries within the analysis areas and disclose the potential effects to these resources by alternative. The analysis areas used includes individual exchange parcels, 47 watersheds (5th field HUC), and subwatersheds with the highest concentration of exchange parcels. The analysis area includes portions of 13 subbasins, across four river basins. Of the 47 fifth level HUCs involved in the Proposed Land Exchange, six account for 50% of the exchange acres, and twelve account for 75% of the exchange acres. This indicates that many watersheds involve extremely minor acreages that would not represent measurable changes to fisheries resources. However, there are fifteen subwatersheds (sixth level HUC) that involve at least 5% of their area in the proposed exchange. These subwatersheds warrant closer examination. The same approach in determining effects was taken in the Hydrology, Wetland and Floodplains section. Refer to that section for additional information about these fifteen subwatersheds.

The fisheries evaluated include Non-listed fish, Mid-Columbia and Snake River steelhead trout, Mid-Columbia and Snake River Chinook salmon, and bull trout. These fisheries are addressed in the order mentioned above.

Affected Environment

The affected environment is adequately described in the Vegetation, Hydrology, Wetland and Floodplains, Water Rights, Soils, Range and Transportation sections. This section does not repeat this information but refers the reader to these sections as deemed appropriate. The following is a discussion related to management activities that potentially affect fisheries within the analysis area.

Potential effects to steelhead, Chinook salmon, and bull trout focuses on four primary areas of management: grazing by livestock, logging, roads, and water rights. The mechanisms involved in these activities that could affect fisheries are described below and referenced in the Environmental Consequences narrative. Alternatives are compared by the miles of fish habitat being conveyed and acquired rather than repeat specific effects of each management activity or mechanism. Therefore, gain/loss in stream miles of habitat by alternative along with professional judgments are considered measurement indicators for comparing relative effects caused by livestock grazing, logging, roads, and water rights.

Effects from Livestock Grazing

All watersheds in the Proposed Land Exchange have some level of livestock grazing. FS rangelands are managed to standards outlined in PACFISH/INFISH. PACFISH and INFISH establish riparian management objectives (RMO) and provide standards and guidelines designed to attain or maintain RMOs. RMOs exist for pool frequency, water temperature, large woody material, substrate sediment, bank stability, lower bank angle, and width to depth ratio. AMPs are consulted through the Level I consultation process. Specific standards and monitoring are agreed to in this process. The standards for range and riparian conditions would not change as a result of the Proposed Land Exchange. Acres would be added and subtracted from allotments, AUMs would be reduced in some allotments, but regardless of these changes the standards agreed to in previous consultations would not change. The management implications related to allotment changes disclosed in the Range section do not necessarily represent changes (positive or negative) to range or riparian conditions. The following list of likely negative effects from grazing have all been considered and mitigated in existing biological assessments for AMPs.

The most likely negative effect that grazing poses to fisheries habitat are as follows:

- Retarding development of a shrub layer next to streams by cattle “lounging” in riparian areas for too long and/or at improper times of year. This could lead to increases in water temperature as shade is reduced or prevented from developing.
- Hoof sheer and overgrazing of streamside grasses and forbs can contribute to bank instability, changing stream morphology at a localized scale, creating point sources for sediment and substrate embeddedness. These effects can ultimately lead to reduced quality of fish habitat for spawning, foraging, migration, and rearing.
- Intense and focused cattle use in riparian habitat conservation areas (RHCA) degrade riparian habitat through compaction, denuding of vegetation, point sources of nutrients, and establishment of undesirable weeds. Livestock trailing, bedding, salting, loading, and handling facilities are some of the focused uses that should be kept out of RHCAs. These activities near streams can lead to degraded water quality, sediment and nutrient input to streams, and damage to stream banks that cumulatively decrease fish production and survival.

- Direct damage to redds can occur if cattle are permitted to graze along spawning streams while fish are spawning or emerging. This occurs when cattle travel in or across streams. There is the potential for direct damage to redds where fish eggs are crushed or knocked loose and flushed downstream. There is also the possibility for cattle to disrupt spawning behavior of fish by keeping males from fertilizing eggs, or by chasing females from redds while in the process of depositing eggs. These effects can result in direct mortality of eggs and reduced fish production from the affected spawning cycle(s).

Federal lands that have permitted livestock grazing are generally maintained in better condition than non-Federal lands that are grazed. This is largely due to the standards and guidelines that govern grazing on public lands, and the monitoring and oversight provided by the interested public and regulatory agencies. There are no state laws that govern grazing near streams on privately owned lands. There is also no outside oversight for grazing on private lands, other than permitting of confined area feeding operations. This conclusion is based on 10 years of observations by Mark Penninger in central and northeastern Oregon, and applies mainly to larger landowners who allow grazing on their lands secondary to timber management objectives. For the above stated reasons, acquired parcels and conveyed parcels within allotments are expected to improve over time in regard to achieving RMOs. Federal parcels conveyed outside of allotments (except those in Alternative 4) are expected to degrade over time if subjected to livestock grazing.

The FS would continue to administer allotments to assure PACFISH/INFISH standards and guidelines are met and that resources are meeting or moving toward a satisfactory condition; RMOs in the case of riparian areas. If there is a change in the ability of managers to maintain desired conditions, adjustments in stocking would be made through administrative or environmental analysis of AMPs. It takes the FS time to make these adjustments. For this reason, it is not automatically assumed that a reduction in AUMs in an allotment as described in the Range section would result in improved range conditions within a short time.

Effects from Forest Management

Logging of mid and late structural forested stands could result in adverse effects to fisheries habitat. The majority of adverse effects can be reduced or eliminated through retention of stream buffers. The following documents findings and assumptions made in evaluating effects to fisheries from forest management.

- Removal of trees that contribute to stream shade or could be recruited as large woody material in the channel can lead to degraded stream conditions. Increased stream temperatures can result from reduced shade. Reductions in future large woody material can lead to decreased pool frequency, less cover for fish, and decreased structural complexity in streams. These indirect effects result in less usable fish habitat, increased watershed efficiency (a negative effect related to the rate that water escapes a landscape), and overall lower productivity for fish.
- Harvesting activities result in soil compaction, soil displacement, accelerated erosion and weeds. When harvesting outside of RHCAs and mitigating with proper restoration techniques harvesting may have little or no influence on streams. However, if harvesting activities are not mitigated or occur in RHCAs this activity would contribute sediment to streams, change seasonal run-off patterns, and ultimately reduce fish habitat quality.
- Created openings in forested stands may lead to changes in transpiration and the timing and rate of snow melt, which can lead to changes in water yield and peak flows. These effects are not being discussed in detail in this analysis because recent reviews of literature demonstrate that the relationship is highly variable (Stednick, 1995 and Scherer, 2001).

Logging on private lands with mid and late structural forested stands would progress at a rate determined by timber markets and landowner objectives. It is assumed that private timber operations would adhere to standards in the Oregon Forest Practices Act. Timber management on FS lands would proceed at a rate determined by Forest priorities and stand conditions. PACFISH buffers would be applied to all logging on public lands. The PACFISH/INFISH standards contain considerations for managing within RCHA's where such actions would help in the attainment of RMOs. These buffers are considered adequate to protect fish habitat. Buffers on private lands would be retained at least to the minimum required by the Oregon Forest Practices Act. Buffers on private lands would be marginal for protection of fisheries resources, except in Alternative 4 where deed restrictions call for the same stream buffers as applied to FS lands. The Oregon Forest Practices Act specifics are covered in detail in "Oregon's Forest Protection Laws, An Illustrated Manual", pages 21-33 (Logan 2002) located in the PR.

FS stream and wetland protection measures are more protective of water and fisheries resources than the state of Oregon standards. The state regulations allow for the removal of shade producing trees, removal of future large woody material from streams, and a narrower buffer of vegetation to filter sediment from runoff.

The effects of upland logging are difficult to assess in terms of actual effects to fish populations, but it is reasonable to assume an increased likelihood of negative effects with increased acres of logging. It is also reasonable to assume that PACFISH/INFISH stream buffers include a greater margin of protection than the narrower buffers afforded by the Oregon Forest Practices Act. Therefore, logging on FS lands would pose less of a risk to fisheries than logging on private lands.

Effects from Roads

There are many road and access related issues that are being evaluated in the proposed exchange. Some site-specific decisions concerning roads are beyond the scope of this DEIS. The Road section of this DEIS disclosed the following assumptions made to evaluate roads by alternative: 1) "Any deferred road maintenance activities related to public safety, protection of cultural resources, or protection of Threatened and Endangered species, or related to providing functional drainage would be implemented as soon as possible following the Proposed Land Exchange", 2) "Roads to be acquired that are currently closed for public access would remain closed." and 3) "Roads to be acquired that are currently open for public access would remain open and maintained for High Clearance vehicles, except where roads need to be closed for public safety reasons".

Roads are relevant to fisheries in the following ways:

- Roads located within RHCAs often occupy up to half of the riparian area. This restricts lateral channel migration and full use of the floodplain.
- Roads create barriers to fish movement where culverts are undersized, too steep, or perched.
- Native surface and gravel surface roads often contribute sediment to nearby streams, particularly when drainage structures are absent or poorly maintained. This can contribute to increased substrate embeddedness, thereby reducing effectiveness of spawning habitat or contributing to mortality of fish eggs.
- Roads can increase the drainage network on a watershed scale. When roads become hydrologically connected to streams, watershed efficiency increases. The result is more rapid movement of water from landscapes because roads become conduits for water, rather than water infiltrating through the soil and being slowly released over a longer time period. The

effect to fish is changes in water quantity and peak flow timing that can interrupt migration, decrease available refugia, and create seasonal in-stream barriers to fish movement.

Based upon the documented assumptions in the Road section, the most significant effects to listed fisheries would be addressed on acquired roads within one year of this proposed exchange. Other less indirect effects to fisheries would be addressed later (first decade) and would depend on availability of funding and Forest priorities. Roads that are acquired by the FS are more likely to be maintained. This would result in reduced sediment, culverts replaced and maintained to accommodate fish passage, and "draw bottom roads" obliterated or relocated to restore floodplain function.

Roads that remain in private ownership are generally not maintained to the same standards as roads on NF lands. Roads conveyed from NF to private could expect to be maintained only to address immediate needs for logging or access by the landowner. Drainage structures are likely to be less frequently maintained and one would expect no decrease in roads within RHCAs on private lands. On non-Federal forest lands, OAR Chapter 340, Division 41 #11 is in effect.

Forestry on State and Private Lands: For forest operations on State or private lands, water quality standards are intended to be attained and are implemented through BMPs and other control mechanisms established under the Forest Practices Act. (OARS 527.610 to 527.992) and rules there under, administered by the ODF. Therefore, forest operations that are in compliance with the Forest Practices Act requirements are (except…) deemed in compliance with this Division. DEQ will work with the ODF to revise the Forest Practices program to attain water quality standards.

Although BMPs are intended for forest operations on non-Federal lands, very little oversight is available to enforce these requirements. Also, some of the poor road conditions found on private lands are not associated with "forest operations" and would not fall under the authority of the State Forest Practices Act. Differences in effects from roads between alternatives are assessed in terms of road miles within 300 feet of streams. Roads within 300 feet of a stream are more likely to contribute to the detrimental effects discussed above. It has been determined there would be little additional benefit to this analysis by disclosing the road distance from streams based on stream classes 1-4. Table 58, located in the Road section, is a summary of roads by alternative. This table displays total open and closed acquired road miles within 300 foot and 150 foot stream buffers by alternative.

Effects from Water Rights

Water rights are a complex topic that involves legal, environmental, and economic aspects. The relevance of water rights to fisheries relates to in-stream water being available for fish in sufficient quantities and timing that do not interfere with life history requirements of fish and their food sources. Over-allocated water resources can leave streams dry or with inadequate flows to support fish during parts of the year, generally during summer and fall. (Timothy Bliss). The Water Rights Environmental Effects Report (PR) documents what is currently known about water rights in the Proposed Land Exchange parcels.

Some key considerations regarding water rights include:

- The official position of the NF as stated by the Chief, Principle 1: Water Uses on NFS lands: "We recognize and respect the authority of states to allocate water available for appropriation. We respect valid, existing water rights and will manage water resources on NFS lands to minimize impacts adversely affecting the exercise of such rights" (Bosworth 2004).
- Federal reserved water rights would be lost on conveyed property, and would not accompany acquired property. This is a negligible consideration since courts rarely uphold Federal reserved water rights.
- Water rights (other than Federal reserved rights) would be transferred with land parcels.

- The FS generally does not cancel water rights held by the agency.
- Specific decisions about changes to water rights, abandoned water rights for example, would not be made early enough in the EIS process to incorporate specifics into this analysis of effects.
- Only three streams would be affected by modeled flow reductions of 5% or more under the proposed exchange: Joseph Creek, Meacham Creek, and Middle Fork John Day River. Water uses on many streams appear to have been in non-use status. Cancellation would likely protect an existing condition of restored streamflow.

The Water Rights section states that 81 land exchange parcels contain water rights or water developments. Of these, 20 water rights on lands proposed for acquisition and one on a conveyed parcel that appear to have been in non-use status for more than five years.

Environmental Consequences

The largest scale on which listed salmonids is analyzed is the Evolutionary Significant Unit (ESU) in the case of steelhead trout and Chinook salmon, and the Distinct Population Segment (DPS) for bull trout. These scales cover too large of an area to allow meaningful discussion of effects for most projects. Therefore, the effects analysis focuses on smaller scales where local changes to habitat can be assessed. The fifth level Hydrologic Unit Code (HUC) is used as the next step down in scale from ESU or DPS. Occasionally the sixth level HUC is referenced. The parcel is the smallest scale addressed in the analysis.

Non-Listed Fish

There are several species of fish within this analysis area that occur in waters also occupied by Federally listed bull trout, Chinook salmon and steelhead. Redband trout, westslope cutthroat trout, and resident rainbow trout are recognized as either sensitive or management indicator species on the three national forests involved in the Proposed Land Exchange. Streams in this analysis area also support numerous species of non-game fish, both native and introduced (sculpin, suckers, catfish, largemouth and smallmouth bass, shiners, etc.). Practically all waters occupied by these species also hosts at least one of the Federally listed fish species. These streams are protected by standards outlined in PACFISH and INFISH. The FS implements stream protection standards according to PACFISH or INFISH regardless of the presence of listed fish species. Therefore, streams that only support non-listed resident fish receive the same protection as other streams that support listed species. For this reason only steelhead trout, Chinook salmon, and bull trout will be analyzed in detail.

Mid-Columbia and Snake River Steelhead Trout

The Snake River and Mid-Columbia populations of steelhead trout *(Oncorhynchus mykiss)* are listed as Threatened under the Endangered Species Act. These two populations represent ESUs; units by which NOAA - Fisheries tracks status and recovery of listed anadromous fish populations. Critical habitat was designated by NOAA - Fisheries in March of 2000, but was later rescinded due to litigation. This original critical habitat includes all accessible habitats within the range of this species for 19 evolutionarily significant units for listed anadromous fisheries previously listed under ESA. This original version of critical habitat was used for all analyses involving steelhead.

Table 63 shows the watersheds (5^{th} level HUC), how many miles of steelhead habitat exist, and miles of habitat within exchange parcels. These miles include all categories of habitat including spawning/rearing and migratory.

Table 63. FS Miles of Steelhead Habitat by 5th Level HUC On Proposed Land Exchange Parcels.

Watershed Name	Miles of Steelhead Habitat	Miles of Steelhead Habitat in proposed exchange		
		Parcel	Acquired	Conveyed
Malheur National Forest				
Beech Creek	40.53	FM11 FM12 PM8B	 0.08	0.09 0.37
Big Creek	26.34	PM5	0.76	
Camp Creek	18.41			
Cottonwood Creek	8.50			
Laycock Creek	39.09	PM20	1.15	
Long Creek	11.52			
Lower NF John Day River	21.45	FM18		0.25
Murderer's Creek	32.74	PM21	1.22	
Strawberry Creek	26.31	FM4 FM6 FM7 FM8		1.19 1.02 0.69 0.74
Upper John Day River	10.54			
Middle SF John Day River	8.79			
Upper Middle John Day River	26.57	PM2	2.07	
Umatilla National Forest				
Big Creek	5.99	PU20	0.57	
Birch Creek	5.17			
Lower Camas Creek	12.98			
Meacham Creek	58.31	FU2 FU3A FU3B PU11 PU9A PU9B	 1.08 0.57 0.11	1.22 0.59 0.30
NF John Day R/Big Creek	17.04	PU16D PU16E PU16F	0.19 1.16 0.71	
NF John Day R/Potamus Cr.	35.48	PU21	0.44	
Upper Camas Creek	38.98	PU15	0.66	
Upper NF John Day River	27.53	PU13	0.15	
Wall Creek	31.02	PU22B	0.93	

Table 63. FS Miles of Steelhead Habitat by 5th Level HUC On Proposed Land Exchange Parcels (continued)

Watershed Name	Miles of Steelhead Habitat	Miles of Steelhead Habitat in proposed exchange		
		Parcel	Acquired	Conveyed
Wallowa-Whitman National Forest				
Bear Creek	26.65			
Big Sheep Creek	56.65	FW10		0.09
		FW6C		0.08
		PW31	1.03	
		PW32	0.56	
Chesnimnus Creek	78.94	PW51A	0.50	
		PW51C	0.25	
		PW51D	0.32	
Grande Ronde R/Five Points	98.93			
Grande Ronde R/Mud Creek	69.08			
Little Sheep Creek	54.86	PW24A	0.52	
		PW24B	0.49	
		PW24C	0.64	
		PW24D	0.54	
		PW24H	0.55	
		PW25D	0.12	
Lostine River	28.08			
Lower Imnaha River	101.18	PW1	0.10	
		PW10A	0.67	
		PW10B	0.31	
		PW13A	0.20	
		PW13B	0.32	
		PW13C	0.24	
		PW13D	0.22	
		PW16A	0.30	
		PW16C	0.37	
		PW16E	0.97	
		PW19B	1.17	
		PW19C	1.13	
		PW20A	0.67	
		PW20C	0.15	
		PW2A	0.20	
		PW2B	0.11	
		PW3	1.85	
		PW48	1.43	
Lower Wallowa River	36.57			
Meadow Creek	136.43	FW18		0.66
		PW44A	0.35	
		PW44B	0.25	
		PW46	0.92	

Table 63. FS Miles of Steelhead Habitat by 5th Level HUC On Proposed Land Exchange Parcels (continued)

Watershed Name	Miles of Steelhead Habitat	Miles of Steelhead Habitat in proposed exchange		
		Parcel	Acquired	Conveyed
Middle Imnaha River	66.13	PW25A PW25B PW25C PW25D PW27C	0.36 0.92 0.98 1.00 0.61	
Middle Wallowa River	15.11			
Upper Imnaha River	57.47			
Upper Joseph Creek	78.13	PW34A PW34B PW34C	1.00 1.30 1.38	
Upper Wallowa River	32.02			
Totals:	**1,439.52**		**36.85**	**7.29**

Alternative 1: Proposed Exchange

Alternative 1 would acquire approximately 37 miles of steelhead habitat, 11.50 miles in the Mid-Columbia ESU and 25 miles in the Snake River ESU. Also, 6.5 and 0.8 miles of steelhead habitat would be conveyed in the Mid-Columbia and Snake River ESU's respectively. This would result in a net increase in steelhead habitat coming under FS management of 5.0 and 24.2 miles for the Mid-Columbia and Snake River ESU's respectively. To put these figures into perspective, there are 35 fifth level HUCs that contain exchange parcels with steelhead habitat. These 35 HUCs contain nearly 1,400 total miles of steelhead habitat. Thirty-seven miles of stream proposed for acquisition represents about 2.6% of the habitat in the watersheds involved. This represents a negligible amount at the ESU scale. Seven miles of habitat proposed for conveyance represents .5% of available habitat. Table 63 shows the miles and distribution of steelhead habitat over the three forests involved in the Proposed Exchange Alternative.

The net increase in steelhead habitat coming under FS management would lead to improvements in fisheries habitat through correction of point sources for sediment from poorly designed/located roads, improved livestock grazing practices near streams on acquired parcels outside of allotments, and wider future stream buffers in FS logging areas. These positive effects would represent minor contributions to recovery of steelhead habitat at the ESU scale. Although, positive effects could result in greater hatching rates and fingerling survival in specific acquired streams with steelhead habitat. An example would be the Upper, Middle, and Lower Imnaha River. This river has a total of 18.7 miles of steelhead habitat that would be acquired in Alternative 1.

The Butcher Creek subwatershed (6th Level HUC) would convey 10.5% of its total acres and acquire 6.6% of its total acres, for a total acre net reduction of approximately 3.9%. The Bear Creek subwatershed would convey 20.2% of its total acres, and no acres would be acquired. The Upper Deer Creek subwatershed in the Lower North Fork John Day River watershed would convey 12% of its total acres and acquire 1.4% of its total acres for a total acre net reduction of approximately 10.6%. These three 6th Level HUC subwatersheds represent the greatest potential for negative effects to steelhead from the Proposed Land Exchange. The potential for negative effects comes from appreciable percentages of subwatersheds being conveyed to private owners that would likely implement less protective management standards.

Alternative 1 would acquire 56 miles of road within 300 feet of streams. The acquisition of these roads would offer the greatest opportunity for restoration or mitigation of road effects to water quality. Not all of these roads are adjacent to steelhead habitat, but the measurement indicator of total miles of road within 300 feet of streams provides a good index to compare with other alternatives.

Under the Proposed Exchange Alternative, the 37 miles of steelhead habitat would be managed to higher environmental standards. Monitoring of habitat and fish populations would be more likely to occur.

Alternative 1 would acquire 64 parcels with water rights and/or developments and would convey parcels with 17 water rights and/or developments. Approximately 20 of the water rights on aqcquired parcels and 1 on a conveyed parcel appear to have been in non-use status for more than 5 years. Future use of the water right on the conveyed parcel is under the jurisdiction of OWRD. The future use of water rights on parcels proposed for acquisition is unknown and cannot be assumed to contribute to instream water for fisheries and other values. If these parcels are not acquired, water rights could potentially be used and decrease current lows.

Summary- Alternative 1

When comparing all alternatives, Alternative 1 would represent the greatest potential benefit to steelhead trout based on the amount of habitat that would be acquired. Although some detrimental effects would likely result from roads and logging on conveyed parcels, the majority of these effects would be upslope and pose minor indirect effects to steelhead trout.

Alternative 2: No Action

This alternative would retain ownership patterns as they currently exist and no steelhead habitat would be acquired or conveyed.

The indirect effects of not exchanging the proposed parcels are related to forgone opportunities to consolidate ownership boundaries that would increase management efficiencies on public land relative to steelhead habitat. The No Action Alternative would forego an opportunity to acquire approximately 37 miles of steelhead habitat and would not address restoration needs required by the FS to comply with the Endangered Species Act. For example, 56 miles of road within 300 feet of streams would remain under private ownership. This alternative would prevent the FS from addressing site-specific problems with culverts and sediment sources.

The missed opportunity to improve management on 37 miles of steelhead streams represents discountable negative effects when considered at the ESU scale for either the Snake River or Mid-Columbia ESU. Under Alternative 2, adverse effects that likely would influence steelhead fisheries such as increased sediment to streams from poorly maintained/designed roads, intensive livestock grazing, holding facilities near streams, and logging to Oregon Forest Practices Act standards would continue. These possible effects are generally slight and not measurable at the fifth level HUC scale.

Summary- Alternative 2

When comparing all alternatives, Alternative 2 represents the least benefit to steelhead trout because no habitat would be acquired. Opportunities to acquire and substantially restore habitat would be foregone.

Alternative 3: Purchase

Alternative 3 would purchase 0.71 miles of steelhead habitat within the Mid-Columbia ESU and 8.56 miles in the Snake River ESU. No steelhead habitat would be conveyed in this alternative.

There would likely be improvements in steelhead habitat conditions on the 9.27 miles following acquisition, but these positive effects would be miniscule relative to the ESU scale. Any positive effects would likely not be realized in increased survival or production of steelhead. Five and a half miles of road within 300' of streams would be acquired with Alternative 3. The opportunities for stream restoration (related to roads) and mitigation of road effects to water quality are minimal with this alternative. The small scale of potential improvements to roads in Alternative 3 would have a negligible influence on steelhead populations.

Under Alternative 3, logging of merchantable private forestlands would continue on parcels not purchased. These acres would be subject to the less protective stream buffers required by the Oregon Forest Practices Act. Steelhead streams located within these commercial forestlands would likely be protected from indirect effects from logging. Although, the narrow riparian buffers would provide less protection from unexpected events that can compromise or invalidate narrow stream buffers. Wildfire, insects, disease, wind, and floods are more likely to compromise a narrow stream buffer than a wider one.

Summary- Alternative 3

When comparing all alternatives, Alternative 3 is considered as ranking below Alternatives 1 and 4 when considering benefits to steelhead trout. This alternative would only purchase minor amounts of steelhead habitat and would convey no habitat.

Alternative 4: Deed Restriction

Alternative 4 would acquire 33.3 miles of steelhead habitat, 8.3 miles in the Mid-Columbia ESU and 25 miles in the Snake River ESU. Conveyed steelhead habitat would be the same as Alternative 1.

An important difference between Alternatives 4 and 1 is that all conveyed lands would be managed the same as FS administered lands in regard to streamside habitat. PACFISH buffers would apply to logging projects and livestock grazing would be restricted in spawning habitat during critical periods to protect redds and emerging fish. Also, livestock grazing standards and monitoring requirements on parcels outside of allotments would match those required on FS lands. These requirements would be accomplished through deed restrictions, essentially protecting fisheries to the same level as on public lands.

Alternative 4 would acquire 33.2 miles of road within 300 feet of streams. This would allow for opportunities to repair or obliterate roads that are having a negative effect to fisheries or water quality, but not as much opportunity as available under Alternative 1.

Less than half the acres of the forested stands would be acquired in this alternative due to the reduced value of Federal parcels with perpetual deed restriction requirements. The merchantable stands not acquired and near steelhead streams would likely be logged according to Oregon Forest Practices Act requirements. Although more acres would be harvested in Alternative 4 than any other alternative, the effects to water quality and riparian condition would likely be less than Alternative 1 and more than Alternative 2. The Hydrology, Wetland, and Floodplain section reached this conclusion because of the deed restrictions that apply to conveyed parcels.

Summary- Alternative 4

When comparing all alternatives, Alternative 4 is considered a close second to Alternative 1 when considering benefits to steelhead trout. Alternative 4 would acquire slightly fewer miles of steelhead habitat than Alternative 1. Also, Alternative 4 would provide the same protections to riparian habitat on conveyed lands as provided on FS lands. The minor difference between this alternative and Alternative 1

would be the less protective management for upslope activities on parcels not conveyed. These private commercial forest parcels would pose an indirect effect to steelhead trout when logged.

Mid-Columbia and Snake River Chinook salmon

Chinook salmon (*Oncorhynchus tshawytscha*) within the Snake River basin is listed as Threatened under the Endangered Species Act. Chinook salmon also occur in the Mid-Columbia basin and are not listed under ESA. However, Chinook habitat in the Mid-Columbia basin is recognized as essential fish habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act, as amended. Effects to Chinook are the same as those discussed for steelhead but different amounts and locations of habitat are involved.

Roads within 300' of Chinook habitat are minimal and were not analyzed in detail because the potential effect is negligible.

Alternative 1: Proposed Exchange

This alternative would acquire 14 miles of Chinook habitat in the Snake River ESU and 1.70 miles in the Mid-Columbia ESU. No Chinook habitat would be conveyed, except for minute corners of six parcels (FW6A-F) that overlap the RHCA along Big Creek (Table 64). These NF parcels along Big Creek are not practical to manage individually or collectively due to their small size and scattered distribution.

Table 64. Alternative 1 and 4- Miles of Spring Chinook Habitat by 5th HUC Watershed

Watershed Name	Miles ONTS	Parcels	Acquired (miles)	Conveyed (miles)
Big Sheep Creek	24.23	FW6C PW31	 1.03	0.08
Grande Ronde R/Mud Cr	3.45		0	0
Little Sheep Creek	6.97	PW24A PW24B PW24C PW24D PW24H	0.52 0.49 0.64 0.54 0.55	
Lostine River	24.80		0	0
Lower Imnaha River	28.92	PW1 PW10A PW10B PW13A PW13B PW13C PW13D PW16A PW16C PW16E PW19B PW20A PW20C PW2A PW2B	0.10 0.67 0.31 0.20 0.32 0.24 0.22 0.30 0.37 0.97 1.17 0.67 0.15 0.20 0.11	

Table 64. Alternative 1 and 4- Miles of Spring Chinook Habitat by 5th HUC Watershed (continued)

Watershed Name	Miles ONTS	Parcels	Acquired (miles)	Conveyed (miles)
Lower Wallowa River	23.66		0	0
Middle Imnaha River	26.02	PW25A PW25B PW25C PW25D PW27C	0.32 0.92 0.98 1.00 0.61	
Upper Wallowa River	23.53		0	0
Grande Ronde R/Five Points Cr	6.04		0	0
Meadow Creek	10.43	PW44A	0.35	
Meacham Creek	1.13		0	0
U.M. John Day River	10.87	PM2	1.74	0
Upper John Day River	10.88		0	0
Big Creek	9.14		0	0
Totals:	210		15.7	0.08

ONTS - Oncorhynchus tshawytscha

The acquisition of 15.7 miles of Chinook habitat holds potential for improved management by the FS through more protective standards for forest, range, and road management. Improvements on acquired parcels could result in increased fish production. Improvements could result in recovery of degraded riparian habitat, restored fish passage, livestock excluded from spawning habitat, and successional recovery of upland forests. Refer to the Hydrology, Wetland, and Floodplain section (effects analysis) for a detailed discussion on environmental consequences to water quality and stream condition under Alternative 1. Stream condition and water quality are important factors used in assessing effects to the Chinook salmon fishery.

Summary- Alternative 1

When comparing with all alternatives, Alternative 1 would represent the greatest potential benefit to Chinook salmon based on the amount of habitat that would be acquired. Although some detrimental effects would likely result from roads and logging on conveyed parcels, the majority of these effects would be upslope and pose minor indirect effects to salmon.

Alternative 2: No Action

Ownership patterns would not change under this alternative.

Approximately 15.7 miles (14 miles in Snake River ESU and 1.7 miles in Mid-Columbia ESU) of Chinook salmon habitat would remain in private ownership, forgoing opportunities for the FS to address degraded habitat conditions on parcels that would have been acquired under Alternative 1.

This alternative would perpetuate existing conditions that could negatively affect Chinook production and survival in the Imnaha River. These conditions include, but are not limited to: cattle handling corrals in RHCAs, noxious weeds in uplands and RHCAs, culverts that pose barriers to fish movement, minimal riparian buffers in forested areas, and cattle grazing in spawning habitat while Chinook are present. Refer to the Hydrology, Wetland, and Floodplain section (No Action effects analysis) for related information.

Summary- Alternative 2

When comparing all alternatives, this alternative represents the least benefit to Chinook salmon because no habitat would be acquired. Opportunities to acquire and substantially restore habitat would be foregone.

Alternative 3: Purchase

Alternatives 3 would purchase 9.85 miles of Chinook habitat and no parcels would be conveyed. Table 65 identifies which purchased parcels in Alternatives 3 would have spring Chinook habitat and total miles of purchased habitat by watershed and parcel.

Table 65. Alternative 3- Miles of Spring Chinook Habitat by 5th HUC Watershed

Watershed Name	Miles ONTS	Parcels	Purchase (miles)
Big Sheep Creek	24.23		0
Grande Ronde R/Mud Cr	3.45		0
Little Sheep Creek	6.97	PW25D	0.12
Lostine River	24.80		0
Lower Imnaha River	28.92	PW10A PW10B PW13A PW13B PW13C PW13D PW16A PW16C PW16E PW19B PW20A PW20C PW2A PW2B	0.67 0.31 0.20 0.32 0.24 0.22 0.30 0.37 0.97 1.17 0.67 0.15 0.20 0.11
Lower Wallowa River	23.66		
Middle Imnaha River	26.02	PW25A PW25B PW25C PW25D PW27C	0.32 0.92 0.98 1.00 0.61
Upper Wallowa River	23.53		0
Grande Ronde R/Five Points Cr	6.04		0
Meadow Creek	10.43		0
Totals	178.06		9.85

ONTS - Oncorhynchus tshawytscha

Potential positive effects would result from 9.85 miles of habitat being purchased. Although no Chinook habitat would be conveyed, improvements in management of upstream habitat on purchased parcels could result in a slight positive effect to Chinook habitat. This positive effect would be negligibly small.

Summary- Alternative 3

In comparing all alternatives, Alternative 3 is considered as ranking below Alternatives 1 and 4 when considering benefits to Chinook salmon. This alternative would only acquire minor amounts of Chinook salmon habitat and would convey no habitat.

Alternative 4: Deed Restriction

Alternative 4 would acquire 15.7 miles and convey .08 miles of habitat. Conveyed and acquired parcels would be the same as Alternative 1.

Only Big Sheep Creek Watershed (.08 miles in parcel FW6C) would convey Chinook habitat (Table 64). All parcels conveyed by Alternative 4 would have a deed restriction that would apply FS standards to all streams. These deed restrictions essentially result in no change in regard to the minimal Chinook habitat conveyed. Potential positive effects would result from 15.70 miles of habitat being acquired for Alternative 4. Although minimal Chinook habitat would be conveyed, overall improvements in management of upstream habitat from acquired parcels could result in a slight positive effect to Chinook habitat. This positive effect would be negligibly small.

Summary- Alternative 4

In comparing all alternatives, Alternative 4 is considered a close second to Alternative 1 when considering benefits to Chinook salmon. Alternative 4 would acquire the same miles of Chinook salmon habitat as Alternative 1 and would convey a minimal amount of habitat. Alternative 4 would provide the same protections to riparian habitat on conveyed lands as provided on NF lands. The minor difference between Alternative 4 and Alternative 1 would be the less protective management for upslope activities on parcels not conveyed. These private commercial forest parcels would pose an indirect effect to salmon when logged.

Bull Trout

Bull trout (*Salvelinus confluentus*) are listed as threatened under the ESA throughout the Proposed Land Exchange analysis area. The USFWS has delineated Proposed Critical Habitat (PCH), which generally represents the highest quality habitat (occupied and unknown) and all habitat thought to be necessary for recovery of the species. Habitat capable of supporting bull trout, but is not identified as PCH, is uncommon and considered negligibly important to the species overall. The effects analyses focused on PCH when addressing bull trout, however all aquatic features (streams, rivers, ponds, lakes, etc.) on FS administered lands are managed to standards outlined in PACFISH or INFISH, which are considered adequate for the protection of fisheries, water quality, and riparian function.

Effects to bull trout from the Proposed Land Exchange would be similar to those discussed for steelhead and Chinook with a few exceptions. Although, some bull trout habitat is identified that does not support either of the anadromous species discussed thus far. Bull trout spawn at a different time of year than most of the steelhead and Chinook runs in northeast Oregon. Therefore, bull trout have different timing considerations for instream work or livestock grazing along spawning and rearing habitat.

Table 66 contains miles of spawning/rearing (SR) and foraging/migratory/overwintering (FMO) habitat that could be affected by the Proposed Land Exchange. Miles of stream potentially affected are miniscule relative to the total amount of habitat available. The PR contains tables showing total miles of bull trout habitat in fifth code hydrologic units. The Proposed Rule for Bull Trout Critical Habitat states that approximately 18,175 miles of streams and 498,782 acres of lakes and reservoirs are proposed as critical habitat for the Columbia River DPS. Of these, approximately 3,391 miles of streams and 44,670 acres of

lakes and reservoirs are located in Oregon; the remainder is distributed between Washington, Montana, and Idaho.

Table 66. Proposed Exchange Miles of Bull Trout FMO and SR Acquired and Conveyed by 5th HUC Watershed

Watershed Name	Parcels	Miles of FMO		Miles of SR	
		Acquired	Conveyed	Acquired	Conveyed
Upper MF John Day River	PM2			1.19	
Meacham Creek	PU11 PU9B PU9A FU1		 0.05	1.05 0.08 0.16	
Middle Imnaha River	PW27C PW25B PW25A PW25C PW24A PW25D	0.56 0.91 0.36 0.96 0.47 1.16			
Lower Imnaha River	PW20C PW20A PW16E PW16C PW16A PW13D PW13C PW13B PW13A PW10A PW10B PW2B PW2A PW1	0.49 0.49 0.83 0.41 0.31 0.26 0.02 0.32 0.19 0.53 0.42 0.08 0.17 0.1			
Little Sheep Creek	PW24D PW24C PW24B	0.51 0.57 0.50			
Lostine River	PW37			0.11	
Big Sheep Creek	FW6C		0.9		
Totals:		10.62	0.14	2.59	0

Table 67 displays a comparison of miles of bull trout habitat involved in the alternatives evaluated in detail.

Table 67. Miles of Bull Trout FMO and SR by Alternative

Alternative	Miles of FMO in 5th Level HUCs		Miles of SR in 5th Level HUCs	
	Acquire	Convey	Acquire	Convey
Alt. 1 Proposed Exchange	10.62	0.14	2.59	0
Alt. 2 No Action	N/A	N/A	N/A	N/A
Alt. 3 Purchase	8.57	0	0.11	0
Alt. 4 Deed Restriction	10.62	0.14	2.59	0

Alternative 1: Proposed Exchange

This alternative would acquire 10.62 miles and 2.59 miles of FMO and SR habitat respectively. No SR habitat would be conveyed and 0.14 miles of FMO habitat would be conveyed.

The addition of approximately 13 miles of bull trout habitat to FS management would likely have minor beneficial effects to bull trout through improved management of roads, upland forests, and livestock grazing. The amount of habitat improvement would likely not be great enough to increase fish production or survival of juvenile fish. Alternatives 1 and 4 would have similar effects and represent the greatest potential of all alternatives for improvement of bull trout habitat.

Alternative 2: No Action

The existing ownership pattern would continue. Bull trout habitat would remain under current management regimes.

This alternative would forego opportunities to improve management on nearly 13 miles of bull trout habitat. Merchantable timber would be logged from private lands not conveyed. This anticipated logging would be substantial for the subwatersheds that involve >5% of their area in the Proposed Land Exchange. The PR has tables describing these watersheds in detail. Under this alternative, NF parcels in Butcher Creek, Bear Creek, and Upper Deer Creek subwatersheds would be retained by the FS but merchantable timber would likely be logged on private parcels in Dry Gulch, Butcher Creek, Bark Cabin Creek, and Texas Bar. The Hydrology, Wetlands and Floodplains section describes effects to water quality, riparian condition, and water yield when describing effects for the No Action Alternative.

Alternative 3: Purchase

Alternative 3 would purchase 8.57 and 0.11 miles of FMO and SR habitat respectively. No bull trout habitat would be conveyed.

A total of nearly nine miles of bull trout habitat would come under a more protective management regime, which could lead to slight increases in riparian habitat recovery. The minor amount of recovery that would occur on these streams (mostly FMO habitat) would be too small to increase fish production or survival of juvenile fish. The beneficial effects of this alternative are greater than Alternative 2, but less than Alternatives 1 and 4.

Alternative 4: Deed Restriction

Like Alternative 1, this alternative would acquire 10.62 miles and 2.59 miles of FMO and SR habitat respectively. No SR habitat would be conveyed, and 0.14 miles of FMO habitat would be conveyed.

The difference between Alternative 4 and other action alternatives is that deed restrictions would apply to 0.14 miles of FMO habitat. The deed restrictions could lead to improvements in habitat conditions over time. Improvements in habitat would likely be negligible because the parcels involved (FW6C and FU1) are very small and contain only five acres each of upland forests. The corners of six other conveyed parcels (FW6A, FW6B, FW6D, FW6E, FW6F and FW9) overlap into the RHCA of Big Sheep Creek but do not actually involve exchange of stream habitat. These parcels include small segments of floodplain associated with seasonally wet meadows that are less than 20 feet wide and located in remote areas with little development pressure. Deed restrictions on these parcels would have immeasurably minor positive effects to bull trout. When considering these minor differences between Alternatives 4 and 1, these alternatives would have the same beneficial effects to bull trout and a discountable risk of negative effects.

Affected Environment - Regional Forester's Sensitive Fisheries Species

Table 68 contains the R-6 Sensitive fish and amphibian species that could exist within the analysis area. The entire analysis area (minimum convex polygon formed by outermost parcels) was used for the purpose of assessing effects to these sensitive species. Potential effects from the Proposed Land Exchange are discussed to the extent practicable, given that little to no survey or distribution information exists for most of these sensitive species.

Table 68. R-6 Sensitive Fish and Amphibian Species

Common Name	Scientific Name
Fish	
Malheur Mottled Sculpin	*Cottus bairdi ssp.*
Margined Sculpin	*Cottus marginatus*
Chinook salmon	*Oncorhynchus tshawytscha*
Westslope Cutthroat Trout	*Oncorhynchus clarki lewisi*
Interior Redband Trout (All stocks)	*Oncorhynchus mykiss ssp.*
Amphibians	
Northern Leopard Frog	*Rana pipiens*
Columbia Spotted Frog(OR only)	*Rana luteiventris*

Environmental Consequences - Regional Forester's Sensitive Fisheries Species

Habitat capable of supporting sensitive species was used as an indicator of effects to these species. It was assumed that more protective management standards would apply to acquired sensitive species habitat; therefore a beneficial effect would result. It was further assumed that conveyed habitat would come under a less protective set of management standards thereby resulting in a potential negative effect. An estimate was provided as to whether the amount of habitat being acquired would be greater or less than what would be conveyed. Due to the number of sensitive species, the broad range of habitats involved, and the uncertainty of habitat requirements for some species, effects descriptions are very general. These effects are described in terms of increase, decrease, or no change in habitat.

The right hand column in Table 69 is labeled "Net Change Federal" which indicates whether there would be a net increase, decrease or no change in the amount of habitat coming under NF management. An increase (acquired) represents a "positive effect", a decrease (conveyed) represents a "negative effect",

and no change represents "no effect". A more in-depth species by species analysis would be of little value because a majority of these R-6 sensitive species are associated with lower elevation streams, marshlands, grasslands, or specific riparian habitats that are absent or scarcely represented in the analysis area.

Habitat was considered in relatively broad terms when estimating whether habitat would be acquired or conveyed for a particular species. In all cases, the net increase was substantial, precluding the need to analyze at a finer scale.

Table 69. R-6 Sensitive Fish and Amphibian Species Effects Analysis

Fish	Natural Heritage Rank[1]	WA Status	OR Status	Federal Status	Year Desig.	MNF	UNF	WWNF	Net Change Federal
Cottus bairdi ssp. Malheur Mottled Sculpin	T3		SC		86	D			No Change
Cottus marginatus Margined Sculpin	G3 N3	S	SV		00		D		No Change
Oncorhynchus tshawytscha Mid Columbia River Spring-run Chinook salmon					97	D	D		Increase
Oncorhynchus clarki lewisi Westslope Cutthroat Trout	T3 N2				00	D	D	D	Increase
Oncorhynchus mykiss ssp Interior Redband Trout (All stocks)			SV		86	D	D	D	Increase
Amphibians									
Rana pipiens Northern Leopard Frog	S2-OR S1-WA	C	SC		00		S	S	Increase
Rana luteiventris Columbia Spotted Frog (OR only)	S2-OR	C		C	00	D	D	D	Increase

Refer to PR for additional information

Alternatives: 1, 3 & 4: Proposed Exchange, Purchase and Deed Restriction

All action alternatives are similar enough in regard to fish and amphibian sensitive species to address together. All sensitive species would experience an increase or no change in habitat coming under more protective management standards. These alternatives would potentially benefit most sensitive species and would not result in a trend toward Federal listing or a reduction in species viability. The action alternatives ranked in order of greatest to lowest potential benefit to these sensitive species are: 1, 4 and 3.

Alternative: 2 No Action

This alternative would not result in a trend toward Federal listing or a reduction in species viability for any R-6 sensitive species. However, this alternative would forego opportunities to acquire and potentially restore habitat for several sensitive species.

Wildlife

The objective of this section is to document relevant information on the existing wildlife habitat condition and disclose the effects assessment for each alternative evaluated in detail. The wildlife evaluated includes Rocky Mountain elk, lynx, bald eagle, old growth associated wildlife species and the Regional Forester's sensitive species list for reptiles, mammals and birds. These species will be addressed in the order listed above.

The analysis area covers a broad range of biophysical and geophysical conditions from canyon grasslands along the Imnaha River to mixed conifer montane settings in the John Day River basin. Habitats represented support a variety of wildlife, some of which are of special interest due to their legal status (threatened or endangered), usefulness as management indicators or value as game animals. Not only does this analysis area represent a broad range of habitat conditions, but it is also distributed over an area approximately 90 by 150 miles. Exchange parcels range in size from 0.56 acres (FW30) to 1,271.15 acres (PU16B). Some parcels are isolated while others are aggregated into several hundred contiguous acres. For these reasons, it is difficult to define meaningful and logical areas for use in evaluating wildlife species. The logical analysis area will generally not conform to conventional projects that are smaller in scope and involve specific planned activities that alter the environment.

Since the action alternatives do not directly involve actual changes to the environment, some assumptions have been made in order to discuss potential effects. These assumptions are based on existing law and observed practices.

- Forested parcels (and forested portions of parcels) containing merchantable timber (generally >9" average d.b.h.) being conveyed from FS to private would be logged to standards in the Oregon Forest Practices Act within 10 years. It is common practice for private forests in northeastern Oregon to be logged to a commercial thinning or clearcut with reserve tree prescriptions. Larger diameter trees are usually targeted for harvest on private lands, whereas prescriptions on Federal lands generally focus on retention of the largest trees and removal of smaller, dead, defective and poor form trees. The results are typically a higher basal area with a large tree component on Federal land and a lower basal area with a lower average tree diameter retained on private lands.
- Non-forest or grassland parcels being conveyed to private would be grazed by domestic livestock (usually cattle) for at least a part of the year.
- Access by the general public would not change appreciably following the Proposed Exchange, Purchase and Deed Restriction alternatives. Gated roads on private parcels would remain gated following acquisition and roads currently open to the public on private lands would remain open following acquisition. This is a consideration for potential disturbance as it relates to elk distribution.

Laws and Regulations Applying to the Analysis

Federal lands are subject to more stringent management standards designed to protect and conserve natural resources than privately owned lands. Also, a significant amount of oversight exists for public land agencies. This oversight helps ensure the legally mandated management standards are applied.

Although some standards exist for private lands, there is often little incentive to adhere to such standards and little or no oversight.

Affected Environment Rocky Mountain Elk

Elk are the most popular and economically important game species in northeastern Oregon. They occur throughout the area influenced by the Proposed Land Exchange. Elk are habitat generalists and can be found using grasslands, shrub steppe, conifer forests, and alpine areas. This broad range of habitats makes it impossible to key in on a specific habitat type and discuss potential effects in a meaningful way for a proposed project of this magnitude. Elk are recognized as management indicators on all three Forests. Elk populations achieving the state management objectives are indicators of good forage/cover arrangements and quality mule deer habitat.

Elk habitat is most commonly discussed in terms of winter and summer range. Winter ranges are generally below 3,500 feet elevation and encompass all aspects and habitat types. The remainder of habitat above 3,500 feet and occupied by elk is considered summer range. Transitional range is sometimes recognized where elk stage near the upper elevation limits of winter range and the lower limits of summer range. Forest Plans in northeastern Oregon contain land allocations and specific standards and guidelines for selected winter and summer ranges. Such allocations recognize elk habitat as a higher priority than other resources. General forestland allocations that encompass the majority of summer elk ranges also have management standards and guidelines specific to maintaining some level of elk habitat, usually at moderate levels.

Specific key elk habitat conditions beyond forest stand structure are not available for most of the parcels in this analysis area. Specifics on elk habitat conditions associated with scattered small parcels and fragmented arrangements would only have limited utility in this analysis.

Environmental Consequences Rocky Mountain Elk

Habitat effectiveness index (HEI) is the measurement indicator required by the three forest plans for site-specific projects that change the arrangement of forage and cover, cover quantity, and the amount and distribution of roads open to vehicular traffic. The Proposed Land Exchange project is not suited to this analysis because of the scattered small parcels and fragmented parcel arrangements over a very large analysis area. Also, the anticipated private management plans are not detailed enough to provide the specific changes to elk habitat and vehicle access conditions necessary for determining accurate HEI's. Wildlife biologists' professional judgments based upon the Forest Plans allocation of winter and summer range, personal observation of locally important elk habitat, distribution of elk, efficiencies in management and hunter access were used to assess effects on elk numbers and compare alternatives. The following discussion provides the important background information for comparison of alternatives.

On parcels proposed for acquisition, the FS has designated approximately 12,776 acres of winter range and 18,908 acres of summer range. Forest Plans identified approximately 11,925 Federal acres of winter range and 6,249 Federal acres of summer range to convey.

Powwatka Ridge/Wildcat Creek – Parcels FW20 through 25B, FW30, PW 39, and PW40
This area is mostly winter range and currently presents challenges for land managers due to the somewhat fragmented ownership pattern. FW22, FW23, and FW30 are small NF parcels surrounded by private land, an arrangement that makes access by the public difficult and management impractical. Parcels FW20, FW21, and FW24-26 are relatively large parcels that are contiguous with other NF lands. This grouping of parcels represents a combination of positive and negative effects to elk habitat. The acquisition of parcels PW39 and PW40 and the conveyance of FW22, 23, and 30 would be advantageous to the FS in regard to managing elk habitat and hunter access. The conveyance of FW24-26 would result in a loss of

1,713 acres of NF winter range, and the acquisition of PW39-40 would result in a gain of 1,036 acres of winter range. The net change is a reduction of approximately 677 acres of NF winter range.

Imnaha River North (downstream from town of Imnaha) – Parcels PW1 through 23
Although not identified as winter range in the Wallowa-Whitman Forest Plan, this area functions as important winter range for elk, mule deer and bighorn sheep. These parcels are grasslands adjacent to the Imnaha River and provide low elevation range for big game during harsh winters. Sizable herds of mule deer and bighorn sheep can be found on portions of these ranges year round. Fences, noxious weeds and hunter access represent problems with these parcels. Acquisition of these parcels would facilitate restoration and improvements of this winter range.

Imnaha River South (upstream from town of Imnaha) – Parcels PW24A through E, PW25, and PW27
This area is grasslands adjacent to the Imnaha River and function as winter range for mule deer, elk, and bighorn sheep. Acquisition of these parcels would consolidate ownership boundaries, thereby increasing management efficiencies that would benefit wildlife (deer, elk, and bighorn sheep).

Meacham/Butcher Creek – Parcels FU2 through 5, and PU5 through 12
These parcels are an important part of the summer range within the Meachum Creek area of the Mt. Emily Game Management Unit (GMU). The NF parcels represent the highest quality cover within a several square mile area. The steepness of surrounding topography, difficult access, and forested cover combine to make the headwaters of Butcher Creek a high quality security area for elk and other wildlife. This area also provides a valuable connection between Meacham Creek and the Five Points Creek area, which subsequently represents the best connection between the Starkey and Mt. Emily GMUs. The private parcels in this area have been logged and contain a mix of forage and hiding cover. Public access on these private lands is strictly controlled. It would be advantageous to acquire PU5 through PU12 to begin restoring habitat, ensure landscape connectivity, and increase management efficiencies through boundary consolidation. However, it would be detrimental to convey FU2 through FU5 because of the likelihood of them being logged and the potential for further restrictions to public access.

Swiss Flat (North of Ukiah) – Parcels FU6 through 14, FU19 through 24, and FU30
This area is winter range. These small isolated parcels are surrounded by a large expanse of private land. This ownership pattern is nearly impossible to effectively manage. Many of these parcels are likely too small to serve as "stepping stones" to facilitate connectivity across a largely inhospitable environment for forest dwelling species (Gobar 2004). Management of big game ranges in this area would be simplified if the NF would convey these parcels.

Coalmine Hill – Parcel FU26
This parcel is located on the exterior boundary of the Umatilla National Forest and is 189 acres of summer range. Conveying this parcel would not contribute to increased efficiencies for managing elk habitat. The parcel contains high quality cover, security, connectivity, and is a known elk calving area. Approximately 400-700 elk spend much of their time on the adjacent private land but move to NF land when disturbed (VanWinkle 2004). Motorized access into this area is prohibited. The combination of cover and low disturbance make this a security area that influences elk distribution in a positive way. Logging on adjacent private lands has eliminated cover for elk. Conveyance of this parcel would likely result in it being logged within the next 10 years. Harvesting of Parcel FU26 would result in further degradation of elk habitat in this area.

NF John Day River/Bridge Creek – Parcels PU16A through H
These parcels represent 3,440 acres of relatively low elevation elk range that functions as winter range in most years and occasionally transitional or summer range. The acquisition of this group of parcels would

compliment elk management efforts on the nearby Bridge Creek State Wildlife Area. Bridge Creek supports the largest wintering population of elk in northeastern Oregon. Improved management of forage, cover, and human access on these parcels could improve elk distribution and habitat utilization on this important winter/transitional area.

North Finger/West Fork Deer Creek – Parcels FM15 through 20
This area represents the only cover over a large landscape that has been heavily logged. These parcels also represent the western extent of public access for hunting and viewing elk in this vicinity. These parcels are contiguous with other NF lands and their conveyance would not contribute appreciably to consolidating ownership boundaries in order to increase management efficiencies of elk habitat. The acquisition of PM23 and PM24 would add to the contiguousness of NF lands in this vicinity, but are less important in regard to increasing management efficiencies of big game habitat than nearby FM15 through FM20. Conveyance of FM15 through FM20 would be detrimental to public elk herds because of the subsequent loss of cover, reduced access by the public (all forms of access for viewing and hunting), and the potential for a negative influence on elk distribution in this vicinity (per Kranich and Miller 2004).

Bear Creek/Hall Creek (NW of Prairie City) – Parcels FM4 through 10
These parcels represent 2,506 acres of winter range. These parcels are largely disconnected from nearby NF lands except where FM4, 8, and 9 share a boundary with the Forest. These parcels are largely characterized by dry upland forests that provide a moderate to low level of cover, but considerably more than adjacent private timber lands and naturally open grasslands. Ochoco Lumber indicated that they would log these parcels "as needed". It would be reasonable to assume that the merchantable timber on these parcels would be logged within 10 years if conveyed. These parcels would likely not provide cover following logging. Conveyance of these parcels would improve management efficiencies of NF lands, although elk use of the area may be altered as a result of the expected accelerated rate of logging. Conveyance of these parcels would simplify management of elk habitat on the adjacent contiguous public land while not forfeiting highly important or critical habitat features.

South Finger – PM13 through 20
Acquiring private parcels along the southern edge of the "South Finger" would improve the FS's ability to manage an important winter range for mule deer and elk.

Alternative 1: Proposed Exchange

This alternative would result in a net increase of 851 acres of acquired winter range and a net increase of 12,698 acres of acquired summer range. This change in winter and summer range ownership would be a direct effect of Alternative 1.

The indirect and cumulative effects of the changes in ownership include more efficient management of big game ranges where NF boundaries are consolidated; making planning, project implementation, and monitoring easier. Fragmented ownership patterns make management of elk habitat difficult due to the variety in personal values and objectives of private landowners. Larger scale projects like aerial fertilization, shrub and tree planting, prescribed burning, access management, and noxious weed treatments are more efficiently accomplished on contiguous tracts of land under a single ownership. Fragmented ownerships inevitably lead to one or more land owners who are not interested in such projects, incapable or unwilling to make the financial investment, or sometimes unwilling to cooperate with the government on a common goal for shared resources. Less ownership fragmentation generally leads to fewer fences. Barbed wire fences that separate ownerships, allotments, and pastures can often be reduced when a fragmented ownership pattern is consolidated. Some mortality to elk (and other wildlife) results when they become entangled in fences. Young calves are most susceptible to this risk. Alternative

1 would result in the greatest potential of all the alternatives for reduction of fences and associated risks to wildlife.

Alternative 1 includes the following parcel groupings that would be beneficial to elk habitat management: Powwatka Ridge/Wildcat Creek; Imnaha River North; Imnaha River South; Swiss Flat, NF John Day River /Bridge Creek; and Bear Creek/Hall Creek. The effect of these groupings being acquired would be an improved ability by Oregon Department of Fish and Wildlife (ODFW) and FS to manage habitat, elk distribution, and hunters.

Alternative 1 also includes the following parcels groupings that would complicate management of elk habitat or lead to habitat degradation from anticipated logging: Meacham/Butcher Creek, Coalmine Hill, and North Finger/WF Deer Creek. The indirect and cumulative effects of these groupings being conveyed would contribute to poor elk distribution, a loss of important cover stands, and reduced public access for viewing and hunting elk.

The FS would acquire approximately 101 miles of road and convey about 60 miles, for a net increase of 41 miles (refer to Transportation section). This increase of FS road miles in a scattered distribution over this large project area does not represent a measurable effect in regards to elk habitat and security.

Cover provided by mid and late seral forest structure would likely be reduced to forage (less than 40% canopy closure) on lands conveyed as indicated by the private participants' management plan surveys and past practice. Alternative 1 could result in reductions in cover within the next 10 years over an estimated 9,615 acres. Cover is assumed to be provided by forested habitat in the following structural stages: stem exclusion closed canopy, under story reinitiation, multi-strata large trees uncommon, multi-strata large trees common, young forest multi-strata and old forest multi-strata. This reduction in cover would be somewhat offset because the acquired forested parcels that are currently providing forage would begin to function as cover within the next 10 to 20 years.

Summary- Alternative 1

Alternative 1 represents the second greatest benefit to elk habitat of all alternatives evaluated in detail. Over the long-term this alternative acquires the most summer and winter range. Alternative 1 acquires considerable miles of roads that could be managed with elk habitat in mind in six of the important parcel groupings important to elk. The drawbacks of Alternative 1 are the projected decrease in cover within the first decade (9,615 acres) and the conveyance of important parcel groupings in Meacham/Butcher Creek, Coalmine hill, and the North Finger (Hamilton Ridge).

Alternative 2: No Action

This alternative would result in a continuation of the current ownership patterns. The amount of summer and winter range under NF management would not change. Existing difficulties presented by current ownership patterns would persist, however elk populations would not suffer long-term or irretrievable negative effects from Alternative 2.

By continuing the current ownership patterns, Alternative 2 does not address the purpose and need of consolidating Federal lands to provide for more efficient management of National Forest System lands. Elk that currently reside on private lands to be conveyed under Alternative 1 would continue to be largely unavailable to the public for hunting and viewing. Cover on private lands would continue to be reduced through logging. The large majority of forested private parcels has been logged and functions as forage for elk. These conditions would likely exist in perpetuity.

Alternative 2 would retain important elk habitat areas in public ownership. The following areas would allow for management efficiency, increased probability of habitat enhancements and restoration, and provide access to the public for hunting and viewing of elk: Meacham/Butler Creek (FU2 through FU5); Coalmine Hill (FU26); and North Finger/WF Deer Creek (FM15 through FM20). This alternative would also keep the following important elk habitat areas in private ownership, which complicates landscape scale habitat management and access by the public: Imnaha River South (PW24A-E, PW25, and PW27); Imnaha River North (PW1 through PW23); Meacham/Butler Creek (PU5 through PU12); NF John Day River/Bridge Creek (PU16A-H); and North Finger/WF Deer Creek (PM23 and PM24). The following public land parcels would remain in public ownership, which perpetuates problems associated with managing small, isolated land parcels: Swiss Flat (FU6 through FU14, FU19 through FU24, and FU30) and Bear Creek/Hall Creek (FM4 through FM10).

Road densities would remain unchanged. Currently 43 sixth level sub watersheds exceed the threshold of 2.5 miles per square mile. This density is recognized as an upper limit for road densities in habitat managed for elk (PR).

Summary- Alternative 2

Alternative 2 is third in the ranking of benefits to elk habitat of all alternatives evaluated in detail. The main benefits to elk from this alternative would be the retention of all important parcel groupings and a decreased likelihood of cover being reduced on lands retained by the FS. The drawback of this alternative would be the foregone opportunity to acquire some important parcel groupings and convey some groupings that currently complicate management of elk habitat.

Alternative 3: Purchase

This alternative would result in the purchase of 714 acres of winter range and 3,515 acres of summer range. This increase in winter and summer range ownership would be a direct effect of Alternative 3.

This alternative would contribute to minor improvements in land management efficiencies through minor consolidation of land boundaries, but not to a degree that would improve the FS's ability to improve elk habitat at a measurable scale.

Cover would continue to be reduced on approximately 8,824 acres of private lands that would not be purchased under Alternative 3. Approximately 791 acres of cover purchased by the NF would continue to function as cover and contribute to a desirable distribution of elk herds. These purchased acres would be eligible for FS treatments (logging) in the future, but elk cover and habitat effectiveness would be management considerations in future FS plans to change the cover/forage arrangement. These cover stands would be more likely to continue functioning as cover under NF management than under private ownership.

Changes to access by the general public would be relatively minor with this alternative. The FS would gain jurisdiction on eight additional miles of road and would not convey jurisdiction over any roads (Refer to Transportation section). These changes are too small to represent a measurable change in FS road densities that would be meaningful in an analysis of elk habitat. Also, the potential for a decrease of barbed wire fences would be negligible under Alternative 3.

Summary- Alternative 3

Alternative 3 represents the greatest benefit to elk habitat in the short and long-term because it would involve a net increase in both summer and winter range and would not convey parcel groupings important to elk. The main drawback of Alternative 3 would be the lost opportunity for cover to develop in 10 to 20 years on 8,824 acres because these private lands would not be purchased under Alternative 3.

Alternative 4: Deed Restriction

This alternative would result in a net decrease of 61 acres of winter range and a net increase of 5,483 acres of acquired summer range. This change in winter and summer range ownership would be a direct effect of the Deed Restriction Alternative.

Alternative 4 would result in an estimated 6,649 acres of cover coming into FS stewardship. These acres would be managed with elk habitat as a primary consideration. If left in private ownership, these acres of cover would likely be converted to foraging areas within 10 years following the exchange. However, 9,231 acres of cover would be conveyed, resulting in a potential net decrease in cover of 2,582 acres. An appendix in the PR displays the potential change in cover as a result of future logging under this alternative. These changes in cover are negligible at the Blue Mountains scale but could have detrimental effects at the local scale. Loss or reductions in cover from logging can have a dramatic effect on the distribution of elk. This is particularly important near the outside boundaries of National Forests where activities on NF lands can push elk onto adjacent private lands where problems arise with fence damage, crop depredation, haystack damage, and over-utilization of limited winter range forage. Another effect of elk moving off NF lands would be that they are not available for viewing and hunting, a reasonable expectation by forest visitors to Blue Mountain Forests. Relatively dense conifer cover influences the distribution of elk, particularly during hunting seasons, by providing security and mitigating the effects of extreme weather (very hot, cold, windy or snow accumulation).

The following parcel groupings are acquired in Alternative 4 and would increase management efficiency, positively influence elk distribution, and improve the public's access to elk on public lands: Powwatka Ridge/Wildcat Creek; Imnaha River North and South; Swiss Flat; NF John Day River/Bridge Creek; and Bear Creek/Hall Creek.

The following parcel groupings are conveyed/acquired under Alternative 4 and would decrease management efficiency of elk habitat, perpetuate poor elk distribution, and decrease the public's access to elk on public lands: all NF parcels and a portion of the private parcels in the Meacham/Butcher Creek grouping; Coalmine Hill; and North Finger/WF Deer Creek (all NF parcels would be conveyed, but neither of the private parcels would be acquired).

Alternative 4 would acquire (jurisdiction on) approximately 53 miles of roads and would convey about 60 miles, for a net reduction of around seven miles of road (Refer to Transportation section). These changes in FS road densities are negligible in terms of effects to elk habitat.

Summary- Alternative 4

Alternative 4 would represent the lowest level of benefits to elk habitat and security of all the alternatives. The benefits of this alternative would be a net increase in summer range (5,483 acres) and a relatively low amount of projected cover loss in the first decade (2,582 acres). The drawbacks of this alternative would include a net reduction in winter range (61 acres), a net decrease of 7 miles of FS roads, and the conveyance of important parcel groupings in Meacham/Butcher Creek, Coalmine Hill, and North Finger/WF Deer Creek.

Canada Lynx

The Canada lynx (*Lynx canadensis*) is listed as threatened under the Endangered Species Act (1973, as amended). The following analysis will be included in the Biological Assessment (BA) for this project.

A Lynx Conservation Assessment and Strategy (LCAS) was developed based on science from the 1999 publication "Ecology and Conversation of Lynx in the United States" by Ruggiero et al. These publications represent the most credible and applicable science concerning the ecology and management of lynx and lynx habitat in the contiguous United States. All mapping and information regarding management of this species is based on these documents.

Plant associations represent key criteria in defining the potential of an area to function as lynx habitat. The subalpine fir, mountain hemlock (rare in NE Oregon), and the cold/dry lodgepole pine associations comprise "primary" vegetation that contributes to lynx habitat. "Secondary" vegetation comprised of the grand fir and cool/moist lodgepole pine plant associations, where it is "immediately adjacent to or intermingled with" primary vegetation may also contribute to lynx habitat (LCAS 2000).

The Lynx Steering Committee prepared a letter dated August 22, 2000, for the Regional Foresters and Forest Supervisors responsible for managing lynx habitat in the contiguous United States. The letter documented criteria for mapping lynx habitat and clarified an earlier letter that originally outlined mapping criteria.

Lynx habitat was mapped according to the criteria and recommendations in the August 22, 2000, letter and was subsequently agreed to by the respective USFWS level I consultation contacts for the forests involved in this Proposed Land Exchange. All identified lynx habitat in this section was taken directly from the latest iteration of lynx habitat mapping.

Affected Environment Canada Lynx

Lynx habitat within parcels is delineated from timber stand exam data; however, habitat is not classified in some parcels because no data exists. Where habitat suitability is not known, a judgment was made based on biophysical conditions and surrounding habitat. For instance, no vegetation data exists for parcel PW35C. However, the parcel is known to meet the elevation and plant community criteria for lynx habitat. Additionally, three sides of this parcel are bordered by denning habitat. From this information one could surmise that the habitat within parcel PW35C is at least potential habitat for lynx, although it could be in an unsuitable condition. Examination of aerial photographs from the late 1990's, and personal communication with ODFW personnel from Enterprise, Oregon indicate that no logging has been done on PW35C that would render it unsuitable. This process was used to determine habitat suitability for parcels where actual data on lynx habitat was absent. Table 70 summarizes which Federal and private parcels are involved with lynx habitat, which lynx analysis units (LAU) they are in, and what is known about habitat conditions at the LAU scale. Maps of the parcels that contain lynx habitat are located in the PR.

Table 70. LAU Acres Summary by Habitat Category and Percentage of LAU Represented in Each Category.

LAU (Parcels containing or adjacent to lynx habitat)	Total Forage in LAU	Total Denning in LAU	Total Unsuitable in LAU	Total Lynx Habitat in LAU
Meadow (PU16B)	24,050 (44%)	8,825 (16%)	21,946 (40%)	54,821
NF John Day River (PU13, PW45)	17,634 (47%)	10,830 (29%)	9,192 (24%)	37,656 (+2,451 no data)
Upper Wallowa River (FW13, PW35A-C)	3,845 (21%)	13,111 (73%)	1,027 (6%)	17,983
Upper Imnaha River (PW28)	6,169 (18%)	24,231 (69%)	4,649 (13%)	35,049 (+7,012 no data)
LostineR./Deer Creek Tribs South (FW17A, FW17C, PW37)	1,537 (9%)	15,528 (88%)	624 (3%)	17,689

Of the five LAUs involved in this proposed project, only one (Meadow) is deficient in suitable lynx habitat. The Meadow LAU currently contains 60% suitable lynx habitat; 10% less than the minimum requirement established in the LCAS (Ruediger 2000). The large majority of these unsuitable acres are a result of the 1996 Tower Fire. The area burned by the Tower Fire is regenerating predominantly to lodgepole pine and is on track to achieve minimum suitable foraging habitat by 2010.

All five LAUs exceed the minimum (10%) recommended percentage of denning habitat. The percentages and acres of denning are listed in Table 70.

The following site-specific information is helpful in concluding what may occur under Alternative 1 on private lands relative to Lynx habitat. PU16B is on the periphery of lynx habitat and contains an unknown, but predictably minor amount of lynx habitat. This parcel is also on the periphery of the elevational and plant community zone necessary for lynx habitat. Past logging (mostly commercial thinning) has resulted in unsuitable conditions for lynx on this parcel. This condition would persist as long as timber production is a priority on the property. The minor acreage in PU16B that has potential to develop into suitable lynx habitat is negligible when considering its size and position in relation to the LAU. PU13 and PW45 are adjacent to one another in the North Fork John Day River LAU. These parcels are also near the periphery of lynx habitat and represent minor acreages relative to the LAU. PW35A-C is a combination of denning and non-habitat. Extremely steep, rocky slopes and stringers of forest, talus, and avalanche chutes characterize this area. The steepness and ground conditions contribute to high logging costs that would discourage many private landowners from managing the timber on these parcels. Although unlikely, helicopters could be utilized for logging this area. PW28 is a 119-acre parcel with 28 acres of denning habitat on a NE exposure. PW37 is a 3.54-acre parcel within a 10,709-acre patch of denning habitat. The minute size of this parcel makes it negligible when discussing lynx habitat unless it represents an outstanding feature or important location deserving of more detailed consideration. This parcel contains no outstanding features that make it any more important than other denning habitat within the Lostine River/Deer Creek Tribs South LAU.

Environmental Consequences Canada Lynx

The LAU is the logical resource unit for addressing effects to Canada lynx. The Proposed Land Exchange involves eleven parcels that contain habitat for threatened Canada lynx (Table 71).

Alternatives 1, 3 & 4: All Action Alternatives

Differences between action alternatives would be negligible when evaluating at a scale meaningful to an analysis of lynx habitat. Alternatives 1 and 4 would involve an increase of at least 231 acres of denning habitat and Alternative 3 would represent an increase of at least 32 acres of denning habitat. No foraging habitat would be involved in the private land proposed for acquisition. See Table 71 for a comparison of action alternatives.

Three NF parcels representing 80 acres of denning and 26 acres of foraging habitat would be conveyed in alternatives 1 and 4, no lynx habitat would be conveyed in Alternative 3.

Table 71. Parcels Containing Lynx Habitat (Alternative Comparison).

Parcel # (Total Acres)	Alt. 1 (Proposed) Acres & Habitat Category	Alt. 3 (Purchase) Acres & Habitat Category	Alt. 4 (Deed) Acres & Habitat Category
PU16B (1271)	No data	0	No data
PU13 (108)	No data	0	No data
PW45 (49)	No data	No data	No data
PW37 (4)	4 denning	4 denning	4 denning
PW35A (229)	122 denning	0	122 denning
PW35B (153)	77 denning	0	77 denning
PW35C (76)	No data	0	No data
PW28 (119)	28 denning	28 denning	28 denning
Total	**At least +231 acres of denning**	**At least +32 acres of denning**	**At least +231 acres of denning**
FW13 (118)	-68 denning, -26 forage	0	-68 denning, -26 forage
FW17A (10)	-10, denning	0	-10, denning
FW17C (2)	-2, denning	0	-2, denning
Total	**-80 denning, -26 forage**	**0**	**-80 denning, -26 forage**

Alternatives 1 and 4 would result in a 125-acre net increase of lynx habitat (foraging and denning combined) and a net increase of 32 denning acres in Alternative 3. The FS would analyze and manage these acres to the standards outlined in the LCAS. Also, any projects planned in or around these acquired NF lands would be subject to oversight through public scoping as part of the NEPA process; and through the consultation process with USFWS. There is no requirement of private landowners to consider lynx habitat in management of their lands.

There is no way to assess what these changes in management control mean to the viability or future recovery of lynx populations. There is little reliable information that allows for an analysis of reasonably foreseeable actions that could contribute to cumulative effects from this Proposed Land Exchange. However, professional judgment suggests the best and worst-case scenarios on lynx habitat for all action alternatives do not represent a measurable benefit or detriment to lynx or lynx habitat. This finding is based on: 1) the minute acreages involved over five LAUs; 2) the fact that most of these acres are on the

periphery of core lynx habitat; and 3) because none of the lynx habitat involved represent outstanding features or important locations deserving of more detailed consideration.

Alternative 2: No Action

Alternative 2 would retain the existing ownership pattern of lynx habitat.

The no action alternative would result in the continued application of standards from the LCAS to lynx habitat on NF lands. Parcels FW13, FW17A and FW17C would remain under Federal management and continue to be considered parts of the LAUs in which they occur. Future management activities affecting the ability of these parcels to function as lynx habitat would be assessed at the LAU scale. The USFWS would be consulted in accordance with the Endangered Species Act, as amended.

Parcels PU16B, PU13, PU45, PW37, PW35A-C, and PW28 would remain in private ownership; therefore, considerations for lynx habitat in future management activities would remain at the discretion of the landowner. Forested private lands are subject to Oregon Administrative Rules (OAR) that ensures compliance with the Oregon Forest Practices Act. These OARs were not designed with conservation of lynx habitat in mind. While OARs are considered adequate to maintain productive forestlands, they are not sufficient to ensure suitable conditions for lynx. However, the private lands that contain lynx habitat in this exchange are relatively small and generally located on the periphery of core lynx habitat areas. For these reasons, the parcels involved in the Proposed Land Exchange are not considered essential or critical for lynx conservation.

Summary- All Alternatives

The continuation of current management regimes on private and public lands involved in the Proposed Land Exchange would not have an appreciable affect on lynx or their habitat. The current public lands would continue to be considered part of the larger LAU and managed to standards set fourth in the LCAS. The minor acreages of lynx habitat on private lands would likely be maintained in unsuitable conditions through logging as long at they remain in private ownership, except for PW35A-C and PW37 for the reasons stated in the Affected Environment narrative. If all private lands containing lynx habitat in this proposed exchange were logged to the greatest intensity allowed by state law, the cumulative effect to lynx would be negligible. Also, the cumulative effect of continued management for lynx on the NF parcels would not contribute appreciably to the conservation and recovery of lynx.

Bald Eagle

Bald eagles in the lower 48 states were first protected in 1940 by the Bald Eagle Protection Act and then were Federally listed as endangered in 1978. The recovery plan for the Pacific states was completed in 1986 (USFWS 1986b). In 1995, the bald eagle was reclassified as threatened in all of the lower 48 States. Habitat protection and management, the ban on use of DDT (Greier 1982) and reduced direct persecution due to education were followed by a population increase. The bald eagle was proposed for delisting on July 6, 1999. A decision on whether to delist the bald eagle is pending (64 FR 36453).

Roosts, nests, and foraging perches on public lands are protected through standards outlined in the Pacific Bald Eagle Recovery Plan, as directed in the FS Manual (FSM 2670.1) and through consultations with the USFWS. The sites on private lands have protections afforded by the Oregon Forest Practices Act and through Section 10 of ESA that is fulfilled through the Habitat Conservation Plan process. The Oregon Forest Practices Act offers protection to roosts and nests comparable, if not equal to protections provided on public lands.

Affected Environment - Bald Eagle

The entire state of Oregon is within the Seven State Pacific recovery area. The Blue Mountain Land Exchange proposal is within Management Zone 9. The Pacific Bald Eagle Recovery Plan outlines goals by management zone that are used to measure recovery. Management Zone 9 has a recovery population goal of eight nesting pairs, producing at least 1.0 young per nest for a five-year average (USFWS 1986). Nesting success in 2003 for Management Zone 9 was five occupied sites with 1.62 young per site (Isaacs 2003). At least one new nest site was identified in 2004 in Zone 9 (Shaw Reservoir). There are no Proposed Land Exchange parcels within several miles of this nest.

Wintering populations of bald eagles regularly occur in low densities throughout the area of the Proposed Land Exchange. The few nesting pairs of bald eagles in the Blue Mountains winter relatively close to their nesting territories. The bald eagles that winter in northeastern Oregon are usually associated with communal winter roosts. Although these roosts are predictably used from year to year, eagles will also congregate at food sources and use diurnal roosts nearby until the food source is gone.

The most comprehensive and current source of information on nesting bald eagles in Oregon is the Results of the 2003 Bald Eagle Nest Survey compiled by Frank Isaacs and Robert Anthony of the Oregon Cooperative Fish and Wildlife Research Unit. There are twenty-one nests documented for the counties (Baker, Grant, Umatilla, Union, and Wallowa) that contain land exchange parcels. Of these, eleven could be considered within the vicinity (considering a minimum convex polygon containing all land exchange parcels) of the proposed Blue Mountain Land Exchange.

Records from the Oregon Department of Fish and Wildlife, ODF, Frank Isaacs (Oregon Cooperative Fish and Wildlife Research Unit), and FS were queried to identify known bald eagle roosts and nests within the vicinity of the Proposed Land Exchange. Known roosts and nests were mapped and compared to the location of Federal and private parcels. Approximately 74 roosts and five nests are located within the minimum convex polygon that defines the area of the exchange. All roosts or nests within one mile of a land exchange parcel were examined in detail to assess the potential effects that could result from the Proposed Land Exchange. One nest and three roosts are within a mile of at least one parcel. Table 72 contains details on which parcels, nests and roosts are involved.

Table 72. Bald Eagle Roosts and Nests within a Mile of Proposed Exchange Parcels.

Roosts	Nests	Parcel Number	Distance
	Dry Creek (628)	PU26A	< 0.25 mile
	Dry Creek (628)	PU26B	On boarder
	Dry Creek (628)	FU28	< 0.50 mile
	Dry Creek (628)	FU27	< 0.75 mile
Wenaha River		PU1B	1 mile
Horse Canyon		PU16F	0.25 mile
Bear Creek (BLM)		FM10	0.50 mile

Environmental Consequences Bald Eagle

Alternative 1: Proposed Exchange

Under this alternative, the NF would acquire PU26A (40 acres) and PU26B (122 acres). This acquisition could improve the future management of the Dry Creek nest by increasing the ability of the FS to monitor eagle use, manage potential disturbance around the nest, and accelerate development of alternate nest, roost, and perch trees.

The Dry Creek nest tree is very near the border of parcel PU26B and 0.25 miles from PU26A. These parcels have been heavily logged and would not provide suitable structures for roosting, nesting, or perching for several decades. Acquisition of PU26A and PU26B would allow their inclusion into a nest site management plan for this site. A nest site management plan involves more detail than a typical written plan submitted to ODF by a private party, as required by the Oregon Forest Practices Act when logging is proposed near a nest or roost. However, parcels FU27 and FU28 are less than 0.75 miles from the Dry Creek nest and would represent the best quality replacement habitat in case the existing nest stand would be lost due to fire, wind, insects, or trespass logging. FU27 and FU28 are contiguous with other NF land and would contribute to the long-term viability of nesting bald eagles in this vicinity. These parcels would likely be logged following conveyance. They are far enough away from the Dry Creek nest to not be subject to requirements of OARs for bald eagle nests.

The three roost sites within a mile of parcels would be protected in the short-term (estimated 20 years) whether the Proposed Land Exchange occurs or not. OARs protect roosts on private land and the Endangered Species Act protects those on NF lands. The only difference between protections afforded roosts on private verses NF ownerships is that long-term protection is more likely under Federal management since OARs do not provide for replacement roosts in case existing ones are lost.

Summary- Alternative 1

This alternative would improve management options for the Dry Creek nest in the long-term through acquisition of PU26A and PU26B, but potentially important replacement bald eagle resources would be lost on conveyed parcels FU27 and FU28. Alternative 1 would have negligible influence in terms of short-term effects to known bald eagle sites. There would be a potential long-term effect in losing replacement nest and roost trees on parcels FU27 and FU28. However, this potential negative effect would not likely be important enough to influence the rate at which recovery goals are achieved in Management Zone 9.

Alternative 2: No Action

This alternative would retain the existing ownership pattern around eagle nests and roosts. Eagle sites near private land would likely be protected, at least in the short-term through OARs. Long-term needs of these sites may not be met since OARs do not adequately address replacement and future nest and roost trees.

OARs apply to eagle sites on private lands and are designed to protect known bald eagle resource sites (nests, roosts, perch trees, staging trees, etc.) from disturbance and destruction. The only known eagle nest that could be affected by future management within a mile of a land exchange parcel is the Dry Creek nest (628). The OARs would continue to apply to any management actions on parcels PU26A and PU26B. These regulations are generally accepted as adequate to protect eagle resource sites, at least in the short-term (20 years). The long-term viability of this eagle resource site would be unknown under the current OARs because the focus of the OARs is on protecting existing nests. OARs do not project future needs in case a nest is lost. PU26A and PU26B have been heavily logged and would not be capable of supporting an eagle nest or roost for several decades. Parcels FU27 and FU28 would represent the closest and best quality habitat capable of supporting nesting or roosting bald eagles should the Dry Creek nest stand be lost. These conditions would likely persist into the long-term since FU27 and FU28 would remain in public ownership.

There would be a slight chance that some potential replacement roost, perch or nest trees could be lost to logging on PU16F if the parcel remains in private ownership, but the risk to eagles would be low. This low risk is based on the location of the highest quality roost trees within a riparian management area for a

"large, type F" stream like the North Fork John Day River. Also, ample options for roosts, perches and nest trees exist along the NF John Day River, many of which are located on NF and ODFW lands.

FM10 contains some suitable replacement roost trees if the Bear Creek roost were to be lost. The Bear Creek roost is located on BLM land and receives the same considerations under the Endangered Species Act as it would if it were located on NF land.

Summary- Alternative 2

Alternative 2 would negligibly influence the viability of bald eagles in Management Zone 9 in the short-term (20 years). The retention of FU27, FU28 and FM10 in NF ownership would be positive for the long-term viability of known bald eagle sites, but would not likely be important enough to influence the rate at which recovery goals are achieved in Management Zone 9. There are no NF timber sale operations in the vicinity of the Dry Creek nest or the Bear Creek, Horse Canyon or Wenaha River roosts that would contribute to cumulative effects under this alternative. Ongoing recreation, road maintenance, and fire suppression activities are considered in the FS management of known bald eagle sites and would not contribute to adverse cumulative effects under Alternative 2.

Alternative 3: Purchase

Alternative 3 would acquire PU16F (343 acres) located 0.25 miles from the Horse Canyon bald eagle roost. All other private parcels near eagle nests or roosts would remain in private ownership and subject to protections provided by the OARs.

The minor positive effects of PU16F coming under public ownership would be negligible in regard to viability of the Horse Canyon roost and to the welfare and recovery of bald eagles in Management Zone 9. The effects of this alternative are very similar to the No Action Alternative.

Alternative 4: Deed Restriction

The potential effects to bald eagles would be quite similar between this alternative and Alternative 1. The differences are outlined below:

- The deed restrictions placed on FU27, FU28, and FM10 would prohibit the logging of green trees > 21" d.b.h. This would retain the larger most suitable trees for future replacement of roosting, nesting and perching trees that are lost.
- Parcel PU16F would be acquired by the NF but this would mean little to no difference in management. The Horse Creek roost is on the south side of the North Fork John Day River on private property within a "Large, type F" riparian management area. The OARs regarding bald eagle roosting resource sites further protect it. This site is already identified in a Resource Management Plan for the private property containing the roost.
- The NF would not acquire parcel PU1B. There would be no difference in potential effects between all alternatives for the Wenaha Roost because PU1B is nearly one mile from the roost and NF and ODFW lands surround the roost. ODFW is the current owner of PU1B. This agency is aware of and sensitive to the needs of eagle roosts.
- Parcels PU26A and PU26B would not be acquired by the NF in this alternative. The Dry Creek nest would likely receive similar short-term protection (20 years) whether PU26A and PU26B remain private or become public. However, long-term viability of the nest through retention of replacement nest trees would not be ensured since FU27 and FU28 are conveyed.

Old Growth Associated Wildlife Species

Management requirements for management indicator species (MIS) are assessed on the National Forest scale in the three Forests' respective Land and Resource Management Plans (LRMP). Each Forest's LRMP provides the legal authority to change dedicated old growth areas through the Forest Plan amendment process. The requirements to maintain the integrity (habitat quality, patch size, spacing) of the allocated old growth network in the event of dedicated areas being exchanged is specified in these Forest Plans. The methods used to assess forest structure are described in the Vegetation Section of this DEIS. The Vegetation section also describes historical range of variability, which will be referred to under Environmental Consequences. HRV is part of a structure based analysis method used in the Interior Columbia Basin Ecosystem Management Project (ICBEMP) to classify vegetation and develop relationships to families and groups of wildlife species. The application of an HRV analysis is recognized as the standard classification system for characterizing the composition and structure of vegetation at broad scales, and specifically to characterize broad-scale patterns of disturbance regimes and succession dynamics over a diverse array of forest and rangeland conditions (ICBEMP, Vol. 1, pg . 16, 2000).

Old growth habitat will be discussed in terms of dedicated old growth {Management Areas C1, C2 (Umatilla), 13 (Malheur), and 15 (Wallowa-Whitman)}, and late/old structure (LOS) which is derived from the HRV analysis. Habitat in either category is intended to provide habitat for the old growth associated wildlife communities (ICBEMP Families numbers 1 and 2), but the two categories have different administrative implications. Additionally, dedicated old growth areas may be currently suitable or capable (of developing into suitable old growth in the future), whereas LOS denotes a stand's current condition.

The old growth associated wildlife species referred to in this old growth discussion are the same as those in Families 1 and 2 from ICBEMP GTR-485. Table 73 contains the families and groups of wildlife species from GTR-485 that will be referred to throughout this effects analysis. Source habitats are used in ICBEMP to assess changes in habitat quality and availability from early European to the current period. Changes in source habitat are an important factor in assessing changes in distribution of wildlife species, groups or families as defined in ICBEMP. Source habitat is defined as "those characteristics of macro vegetation that contribute to stationary or positive population growth for a species in a specified area and time" (Wisdom, ICBEMP GTR-485, pg.4, 2000).

Table 73. Species, Groups, and Families of Old Growth Associated Wildlife Species

Species	Group	Family	Family Name
White-headed woodpecker	1	1	Low-elevation old forest
White-breasted nuthatch			
Pygmy nuthatch			
Lewis' woodpecker (migrant)	2	2	
Blue grouse (winter)	4	2	Broad-elevation old forest
Northern goshawk (summer)	5		
Flammulated owl			
American marten			
Fisher			
Vaux's swift	6		
Williamson's sapsucker			
Pileated woodpecker			
Hammond's flycatcher			
Chestnut-backed chickadee			
Brown creeper			
Winter wren			
Golden-crowned kinglet			
Varied thrush			
Silver-haired bat			
Hoary bat			
Boreal owl	7		
Great gray owl	8		
Black-backed woodpecker	9		
Olive-sided flycatcher	10		
Three-toed woodpecker			
Northern flying squirrel	13		

The analysis of LOS will utilize the same time frames described in the Vegetation Section. Short-term is considered less than 25 years, and long-term is greater than 50 years. Only the fifth level HUCs containing exchange parcels with LOS and/or dedicated old growth areas are analyzed.

Affected Environment

Trends in declines of old growth habitats for wildlife in Families 1 and 2 (low elevation old forest and broad elevation old forest) are documented in ICBEMP, GTR-485, Vol. 3, Table 3. For the Blue Mountains Ecological Reporting Unit there has been a 61%, 72%, 60%, and 12% loss in old growth habitat from historic conditions for families 1 and 2, groups 1, 2, 4, and 5, respectfully. Group 3 is not included in this discussion because it contains one species, the western grey squirrel, which does not inhabit the area of this land exchange. It is assumed the old growth associated species have declined in direct proportion to this loss of habitat in the Blue Mountains. ICBEMP acknowledges widespread declines across the basin for pileated woodpecker, white-headed woodpecker, pine marten, and three-toed woodpecker. Unfortunately, we have very little information on population status/trends on these species for the Blue Mountains, hence the emphasis on habitat.

Northern goshawk is also a species of interest because it is specifically addressed in the LRMPs, protected under Oregon law, and by the Migratory Bird Treaty Act. The LRMPs contain specific standards for managing active goshawk nest sites.

In northeastern Oregon trees ≥21" d.b.h. are generally considered "large", and represent an essential component of mature and old growth forests. An exception is for dedicated lodgepole pine areas set up for northern three-toed woodpeckers where the large tree diameter is considered to be ≥12" d.b.h. These larger trees eventually die and are recruited as snags and logs that provide foraging, nesting and denning substrate for a variety of wildlife species. Large-diameter trees also provide the most suitable structures for raptor nests, nests for arboreal mammals, and cavities for the widest range of species from nuthatches to black bears. Smaller trees do not possess the dimensional characteristics, structural complexity, or decay associated with larger trees, making them poorly suited as nesting and foraging substrate for many wildlife species.

Refer to the Vegetation Section for a detailed description of the upland forest vegetation in the analysis area.

Environmental Consequences

Northern goshawk, pileated woodpecker, northern three-toed woodpecker, and American marten (formerly pine marten) are management indicators of LOS and rely on some form of old growth or mature forest habitat for at least part of their life history. As indicators, these species represent habitat for broader wildlife communities that share similar habitat preferences or requirements. These species are also members of Family 2, Group 5 (goshawk & marten), 6 (pileated), and 11 (three-toed woodpecker) (Wisdom 2000). For this analysis the amount of LOS habitat being acquired or conveyed will be an indicator of the effects to the old growth indicator species, and an indicator of the amount of habitat available for the wildlife species in Families 1 and 2.

Management Requirements exist specifically for management indicator species and are relevant to dedicated old growth areas only. There are approximately 939 dedicated old growth areas on the three Forests representing approximately 169,953 acres. Six parcels totaling 493 acres for conveyance in Alternatives 1 and 4 contain dedicated old growth areas.

A network of dedicated old growth areas (sometimes referred to as allocated old growth areas or "units") was established through a coordinated effort between the three Forests to ensure distributional requirements (Umatilla LRMP 1990), with the intent of maintaining viable populations of the old growth management indicator species and the wildlife communities associated with old growth habitat, Families 1 and 2. This network represents "management requirements" referred to above. The size, spacing, structural characteristics, and total acreage were considered minimum to maintain the viability of old growt management indicator species. Old growth habitat in riparian, wilderness, and backcountry areas are considered to provide a significant amount of habitat that contributes to the viability of these management indicator species. Since the network of dedicated old growth areas are typically surrounded (sometimes isolated for decades) by unsuitable habitat conditions, it is very important that the pieces of the network be maintained to at least retain refugia for the wildlife species they were established for.

When a piece of the network is removed and a suitable replacement area is not located in the immediate vicinity, the integrity of the network suffers. Because viability is such a complex concept, and because the scale needed to assess viability is so large, it is extremely difficult to comment on the effects to viability from losing a few pieces from a much larger network. However, because such a great deal of interest and emphasis surrounds eastside old growth and the associated wildlife populations, it is very important that the Forest Service make every effort to retain the remnants of old growth that currently exists. Although the loss of small pieces scattered widely over a large area may seem unimportant, these losses need to be

considered cumulatively with the near elimination of old growth habitat on private lands, the high degree of fragmentation of old growth habitat on much of the National Forests, and the departure from historical range of variability across nearly all Federal watersheds where management has been prevalent over the past several decades.

Only six parcels (493 acres) proposed for conveyance contain dedicated old growth areas. Although this is a miniscule amount of the total network, the network begins to break down when pieces are removed. The local distribution of old growth habitat and the geographic distribution of habitat are important in maintaining viability of old growth associated wildlife species. The spacing of dedicated old growth areas is a key element in the management requirements that were designed to ensure viability of old growth associated wildlife species.

Although it is not practicable or meaningful to discuss effects to viability of species from the loss of such a minor amount of habitat, it is reasonable to conclude that any loss would certainly not improve or enhance the old growth network. Any loss, especially a permanent loss such as that involved in an exchange would result in a long-term, localized, negative effect to the old growth wildlife community. It could be argued that this project as a whole would result in a potential long-term improvement in the old growth habitat network due to the nearly four to one ratio of acres acquired versus conveyed. This is not a valid argument relative to old growth habitat because there are ample acres of public forests that can develop into old growth habitat over time. There is no benefit from losing old growth habitat now in exchange for potential old growth habitat several decades from now. One example of where such a tradeoff would benefit the old growth network would be if acquiring particular parcels would fill in important geographic gaps in the network. This is not the case with this project in any of the alternatives.

The logical resource unit for LOS habitat is the fifth level hydrologic unit (HUC), although other scales (larger and smaller) can be meaningful when discussing this habitat type. Management Requirements for management indicator species (MIS) are assessed on the National Forest scale in the three Forests' respective Land and Resource Management Plans (LRMP). The Blue Mountains scale is also used to address effects at a larger scale than the fifth level HUC.

Alternative 1: Proposed Exchange Alternative

Refer to Table 40: Conveyed and Acquired Late and Old Structure (LOS) for the Proposed Land Exchange to identify acres of LOS acquired and conveyed for each forest. The Vegetation section narrative following this table describes the classification of LOS by forest and discloses the net effect of loss/gain of LOS acres by watershed for this alternative.

The Wallowa-Whitman NF would convey 467 acres, and acquire 439 acres of LOS; resulting in a net reduction of 28 acres of LOS. All LOS involved (acquired or conveyed) is multi-strata. The large majority of conveyed LOS is in Big Sheep Creek and Grande Ronde/Mud Creek watersheds. The Big Sheep Creek watershed is currently above the HRV mid-point for dry upland forest LOS, but it is not necessarily above the historical range for LOS. Grande Ronde/Mud Creek watershed is well below the HRV mid-point for LOS and is likely below the historical range. Further reductions in LOS would increase the departure from HRV.

The conveyed LOS includes 33 acres of Forest Plan dedicated old growth (MA 15), three acres in FW10 (Big Sheep Creek) and thirty acres in FW24 (Grande Ronde/Mud Creek). The dedicated old growth in FW10 is a small portion of a much larger patch. Three acres of suitable old growth are identified immediately adjacent to the existing dedicated patch. A 74-acre stand (2IH13S998090), approximately two miles from the conveyed dedicated old growth area, is identified as a replacement for the 30 acres of dedicated old growth conveyed in the Grande Ronde/Mud Creek watershed. The location of this replacement stand appears to enhance connectivity for old growth associated wildlife species between two

other dedicated old growth areas, assuming the old growth allocation approach is continued in the next Forest Planning effort. The locations of the replacement areas appear to meet the distribution criteria established in Appendix M of the Wallowa-Whitman Land and Resource Management Plan (W-W LRMP 1990).

The Umatilla NF would convey 1,315 acres and acquire 258 acres of LOS. Of the LOS conveyed, approximately 75% is multi-strata and the remaining 25% is single-strata. Over 73 percent of the LOS conveyed is in Birch, Lower Camas, and Meacham Creek Watersheds. All of these watersheds are below the HRV mid-point for LOS, except for the dry upland forest type in Birch Creek, which is 20% above the midpoint. Even with the one exception in Birch Creek, LOS habitat in general is deficit and likely does not support old growth associated wildlife in the densities and distribution necessary to sustain reproductive populations in these watersheds.

The conveyed LOS includes 75 acres (FU24) of Forest Plan dedicated old growth (CA 1). A 98-acre replacement old growth area is identified approximately one mile to the south of the conveyed dedicated old growth area. The current structure of this replacement area is “young forest, multi-strata”, and contains ample live trees greater than 21” d.b.h. (VanWinkle 2004). The replacement old growth area represents a net increase in CA 1 of 23 acres. Additionally, the habitat quality in the replacement area is superior to that in the conveyed CA 1 area. This Alternative is consistent with Umatilla LRMP direction in terms of size and spacing of old growth allocations. Although the replacement area is of better quality than the existing dedicated area within FU24, an even higher quality old growth patch exists one mile to the east in parcel FU21. However, FU21 is proposed for conveyance, therefore would not be an option for a replacement old growth area as Alternative 1 currently exist.

The Malheur NF would convey 423 acres of multi-strata LOS, 385 of which is forest plan dedicated old growth. No LOS acres would be acquired on the Malheur. Of the conveyed LOS, 413 acres are in the Lower NF John Day River Watershed and the remaining 10 acres are in the Cottonwood Creek Watershed.

Dedicated old growth is located in FM16A (138 acres, Lower NF John Day River & Cottonwood Creek), FM 18 (165 acres, Lower NF John Day River), and FM19 (82 acres, Lower NF John Day River). Two replacement areas totaling approximately 358 acres are identified two miles to the east of the conveyed MA 13 area. The identified replacement areas are two groups of stands of 210 and 148 acres. The closest one to the conveyed MA 13 is two miles to the east. The second area is nearly three miles to the east of the conveyed MA 13. A mile of grasslands and scattered timber separates the two replacement areas. Field reconnaissance of the western most replacement area was done by Cheri Miller (wildlife biologist, Blue Mountain Ranger District), stand data from GIS and aerial photographs were used to assess the other area. The proposed replacement areas are not currently old growth habitat and are not capable of supporting management indicator species that rely on mature or old growth habitat. An open road running the length of the western most area, isolation by surrounding timber harvests, and natural fragmentation due to land types (grasslands, natural openings) further contribute to unsuitable old growth conditions in these replacement areas. Based on existing conditions and the capability of the stands, it would likely require more than 60 years for these blocks to achieve old growth conditions capable of supporting reproducing pileated woodpeckers, goshawks, and other old growth associated wildlife species. The identified replacement areas represent the best options for replacement old growth, but do not meet direction in the Malheur LRMP for dedicated old growth. These replacements also appear to not adhere to the spacing criteria established to meet dispersal distances for dependant species.

Indirect and cumulative effects to late and old structural habitat would occur as a result of shifting management priorities when land is conveyed from public to private ownership, and future management on these lands by the new landowners. Private participants in this exchange have indicated the intent to

harvest timber from greater than 78% of the lands they receive (Ted Anderson's summary of Private Landowners' questionnaires, 2004).

The loss of dedicated old growth for Alternative 1 is 493 acres, which is about 0.3% of the total acres of dedicated old growth on the three National Forests. The net loss of LOS habitat is 1,508 acres, which is about 0.9% of the total acres of dedicated old growth habitat estimated by the Forest Plans in Decade 2 (currently). This relatively small scale of the LOS acreage lost would not likely affect viability of old growth associated wildlife species at the Blue Mountains scale nor at the National Forest scale. However, as individual watersheds have experienced departure from HRV, some species have been locally eliminated, contributing to poor distribution, low interchange of genetic material, and increased vulnerability to catastrophic events as animals were forced into smaller and more isolated islands of suitable habitat. Current vegetation management activities on Forest Service lands are geared toward returning to the HRV; thereby restoring habitat for many species in Families 1 and 2 over time. The conveyance and subsequent logging of parcels containing LOS would have localized negative effects by displacing individual animals, and reducing the geographic extent to which some species can persist at the watershed (fifth level HUC) scale.

For example, parcels FM16A through FM21 on the "North Finger" of the Blue Mountain Ranger District, parcels FU3A through FU4 in the vicinity of Meacham and Butcher Creeks on the Walla Walla Ranger District, and parcel FU21 on the North Fork John Day Ranger District represent the largest, most contiguous areas of LOS that are locally important for old growth associated wildlife in this proposed project.

The proposed conveyance of the North Finger parcels would effectively reduce the western extent of old growth habitat along a relatively narrow band of conifer forest running east and west. Conveying the North Finger parcels would also have a negative effect on the spacing of dedicated old growth areas. The North Finger old growth provides the only interior old growth habitat in the vicinity. Interior conditions refer to forested patches that have an edge to area ratio low enough to alleviate effects from edges. Meaning that edge effects (wind, temperature, relative humidity, sunlight, etc.) reach equilibrium, thereby providing conditions favored by goshawks and other old growth associated wildlife species (Harris 1984). The old growth habitat being conveyed on Hamilton Ridge is expected to be logged within 10 years (see assumptions). Once logged, these parcels would be unsuitable for old growth associated wildlife, an effect that would persist into the long-term.

Field reviews (Miller, 2004) were completed for the North Finger old growth stands and adjacent stands that represent the most likely replacement old growth areas if the existing ones are conveyed. Existing old growth averages 13 trees per acre $\geq$ 21" d.b.h. (four of which are $\geq$ 31" d.b.h.), and provides high quality, multi-strata old growth habitat. Evidence of pileated woodpecker use was observed. The possible replacement areas have an average of 3.5 trees per acre $\geq$21" d.b.h., single-strata, narrow patch configuration, and an open road running the length of one of the stands. This option for old growth replacement would not meet the needs of displaced wildlife if the current dedicated old growth is exchanged and later logged.

Three goshawk nests are known to exist in the west half of the North Finger. One of these (East Fork Deer Creek nest) is located near the east boarders of parcels FM15 and FM17. Conveyance of these two parcels, or any of the North Finger parcels (FM15 through FM21) would severely reduce the ability of goshawks to continue reproducing in this part of the Blue Mountain Ranger District once logging reduces canopy closure, large tree, snag and log densities, overall prey base habitat, and potential nesting structures. The LOS habitat on parcels FM15 through FM21 currently provides the highest quality foraging habitat, the most likely dispersal areas for fledglings, and the highest quality nesting options should the existing nests be lost

The conveyance of the Meacham/Butcher Creek parcels would result in fragmentation and reduction of LOS habitat. This would reduce the capacity of the Butcher Creek drainage to support goshawk, marten, pileated woodpecker, and other old growth associated species. There are no dedicated old growth areas that would be conveyed in this area, but conveyance of these parcels would eliminate future options for old growth habitat reserves in this vicinity. The old growth habitat being conveyed in the Meacham/Butcher Creek area is expected to be logged within 10 years (see assumptions). Once logged, these parcels would be unsuitable for old growth associated wildlife, an effect that would persist into the long-term.

Conveyance of parcel FU21 would result in a long-term reduction of multi-strata old growth in an area that is deficient in this type of habitat.

Cumulative effects would be minimal beyond the indirect effects discussed above since very little LOS currently exits on private property to be logged, and LOS on NF lands are essentially off limits to logging. A more detailed discussion of how Alternative 1 affects HRV is found in the Vegetation section. This discussion concludes that all watersheds affected by Alternative 1 would continue to be deficit in LOS relative to the HRV mid-point for MSLT and SSLT combined, except for the dry upland forest category in Big Sheep and Birch Creeks, and the cold upland forest category in Rhea Creek. Watersheds that would experience the greatest negative effects to old growth associated wildlife are: 1) Lower North Fork John Day River (parcels FM15-FM20); 2) Upper Butter Creek (FU21); and 3) Meacham/Butcher Creek (FU3A-FU4).

Another way to evaluate old growth habitat is to look at “total” old growth at the Blue Mountain landscape scale. Currently there is no accurate estimation of existing total old growth in the Blue Mountains. However, Table 74 indicates that up to 502,833 acres of old growth habitat was estimated to exist in the second decade (current conditions) from all 3 Forest Plans. The wilderness and “other areas” acreages in Table 74 are estimates from the Forest Plans, and the acreages for dedicated old growth come from current geographic information system data. However, it is important to recognize that the acreage figures in Table 74 over estimate the actual old growth habitat that currently exists since a large number of dedicated old growth areas and much of the wilderness areas do not contain functional old growth habitat. Alternative 1 represents a 1,508-acre net loss in LOS, which is about 0.4% of the total acres of old growth (dedicated old growth plus “Other Areas”, not including “Wilderness” in table 74) estimated in the 3 Forest Plans. It should be acknowledged that Alternative 1 would contribute cumulatively to a reduction in old growth habitat in a landscape that is already recognized as very deficient in old growth. The conveyance and subsequent logging of old growth parcels would have localized negative effects by displacing individual animals at the sub-watershed scale. The watersheds that would experience the greatest negative effect to old growth associated wildlife are: 1) Lower North Fork John Day River (parcels FM 15, FM 20); 2) Upper Butter Creek (FU 21); and 3) Meacham/Butcher Creek (FU 3A, FU4).

Table 74. Old Growth Habitat Estimates from Forest Plans, Decade 2 (Acres).

	WWNF	Umatilla NF	Malheur NF	Total
Wilderness	67,000	68,900	35,239	**171,139**
Dedicated Old growth Areas[1]	59,789	44,170	65,985	**169,953**
Other Areas	60,000	51,400	50,350	**161,750**
Total	**186,789**	**164,470**	**151,574**	**502,833**

1) These acres are from the three Forests' geographic information system data on land allocations.
Old growth is defined as areas functioning as habitat of old growth associated species, collectively LOS and dedicated old growth.
Other areas are defined as other old growth outside of dedicated Forest Plan old growth, not within the wilderness management area prescription.

Alternatives 2 & 3: No Action and Purchase

Alternative 3 involves the acquisition of four acres of LOS, a negligible amount, and Alternative 2 would exchange no LOS. Therefore, there are essentially no differences between these alternatives in regard to LOS. No existing forest plan dedicated old growth would be conveyed by these alternatives.

The effects of these alternatives would involve the logging of 697 acres (Table 41) of LOS on private land within the next 10 years (see first assumption on page 2 of this report). The typical logging prescriptions on private lands in northeast Oregon do not retain old growth stand characteristics, and often perpetuate early to mid-successional conditions in perpetuity. The 2,205 acres of LOS that remain under NF management would likely not be logged and would continue to function as LOS until policy regarding old growth changes or a disturbance (fire, disease, etc.) sets back succession in these stands (Table 41). The LOS and dedicated old growth on the North Finger, Meacham/Butcher Creek, and parcel FU21 would be retained in NF ownership and managed for their old growth values. These alternatives would have the least negative effect to LOS of all the alternatives. These alternatives would not contribute to a further departure from HRV for LOS habitat. These alternatives would have the least negative effect on declines of source habitats for Families 1 and 2.

Cumulative effects to LOS from these Alternatives are limited to the future logging of LOS from private lands that would not be acquired (697 acres), and past logging activities that have created the fragmented, deficient LOS situation that currently exists.

Alternative 4: Deed Restriction

This alternative would acquire 413 acres of LOS, and convey 2,205 acres, for a net reduction of 1,792 acres. Table 75 displays the amount of LOS conveyed and acquired by Alternative 4, by National Forest. The amount of LOS being conveyed is the same for Alternatives 1 and 4; therefore effects would be similar as discussed for Alternative 1. Fewer (284) acres of LOS would be acquired in Alternative 4 (413 acres) than in Alternative 1 (697 acres). The main difference between these Alternatives is that lands conveyed in Alternative 4 would have deed restrictions that would retain more substantial riparian buffers and all live trees $\geq$ 21" d.b.h. Diskin reports on page 16 of the Upland Vegetation report (PR) that conveyed LOS "…would likely continue to function as LOS due to the large-tree removal restriction. Therefore, LOS would not be lost." This conclusion is not consistent with expected effects relative to wildlife habitat. Large live trees are an essential component of LOS habitat, but forests need much more than large live trees to function as habitat for the old growth wildlife community. Large diameter snags, logs, multiple layers of canopy (in moister forest types), decadence in at least some of the larger live trees, and overall more structural complexity characterize functional LOS habitat. A restriction on removal of $\geq$ 21" d.b.h. live trees would not necessarily preclude the loss of LOS habitat as it relates to wildlife. Such a restriction would make some stands less economically viable to log, but many conveyed

LOS stands would likely be logged and function more like stand initiation than old growth. Therefore, even though more large live trees would be retained in this alternative, the habitat would still be rendered unsuitable for LOS associated wildlife species, resulting in effects similar to those described in Alternative 1.

Replacement dedicated old growth areas (described earlier in this section) are adequate to meet Forest Plan direction on the Wallowa-Whitman and Umatilla National Forests, but not on the Malheur. These effects are nearly identical to those described for Alternative 1 in regard to dedicated old growth.

The more substantial stream buffers and retention of larger trees pose a slightly less negative effect than Alternative 1, but the difference is negligible when considered in the context of species viability for marten, pileated woodpecker, goshawk, and three-toed woodpecker. There would be 284 fewer acres of LOS acquired by the NF and subsequently managed for old growth values with this Alternative. These 284 acres would likely be logged, resulting in less available habitat for the old growth wildlife community, even though > 21” diameter trees would be retained. Alternatives 1 and 4 would essentially have the same effects to LOS habitat in terms of habitat suitability reduced from logging of LOS in private ownership, and the effects would persist into the long-term (greater than 50 years).

This Alternative would result in nearly the same degree of departure from HRV as Alternative 1, with the exception of the minor amount of LOS retained in riparian buffers, the occasional (too few to quantify) single-strata stands that would not be economical to log due to the abundance of 21” d.b.h. trees, and the 284 acres that would remain under private ownership and subsequently logged.

Cumulative effects would be minimal beyond the potential effects discussed above since very little LOS currently exits on private property to be logged, and logging of LOS on NF lands is largely prohibited by current regulations.

All Alternatives - Summary

Late and old growth habitat has declined strongly from historical periods throughout large areas in the eastside assessment (ICBEMP) and the Blue Mountains, particularly in the low and mid elevations.

Under Alternative 1, six parcels totaling 493 acres of dedicated old growth would be conveyed. The loss of dedicated old growth is 493 acres, which is about 0.3% of the total acres of dedicated old growth on the 3 Forests. Although this loss is small, the conveyance and subsequent logging of old growth parcels would have localized negative effects by displacing individual animals at the sub-watershed scale. Once logged, there would be little or no use by old growth associated wildlife species in those parcels. This alternative would contribute cumulatively, although small to a reduction in old growth habitat in a landscape that is already recognized as deficient in old growth. This loss of old growth habitat at the Blue Mountain scale is not likely to affect the viability of old growth associated species or jeopardize the continued existence of these species in the Blue Mountains.

Suitable replacement old growth areas are available nearby on the Wallowa-Whitman and Umatilla National Forests to meet forest plan requirements for replacing dedicated old growth areas that are conveyed in an exchange. The identified replacement areas for the Malheur National Forest represent the best options, but do not meet minimum requirements in the Malheur LMRP for old growth components. All three National Forest would need a Forest Plan amendment to convey dedicated old growth to another ownership.

Alternative 2 would exchange no old growth (dedicated or LOS) and Alternative 3 acquires only 4 acres, a negligible amount. The 2,205 acres of LOS that remains under NF management would likely not be

logged and continue to function as old growth. The 697 acres of LOS acquired from private lands would not exchange and would likely be logged within 10 years (see assumptions).

Alternative 4 would acquire 413 acres of LOS, and convey 2,205 acres, for a net reduction of 1,792 acres. Lands conveyed would have deed restrictions that would retain more substantial riparian buffers and all live trees ≥ 21 inches DBH. Even though more large live trees would be retained, these parcels would likely lack other old growth structural attributes (snags, logs, multiple canopies) after they are logged. Therefore, the habitat would still be rendered unsuitable for LOS associated species. This would result in similar effects to those described in Alternative 1.

Table 75. Alternative Comparison by Key Indicators.

Key Indicators	National Forest	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Forest Plan Dedicated Old growth Acres Conveyed[1]	Wallowa-Whitman	33	-0-	-0-	33
	Umatilla	75	-0-	-0-	75
	Malheur	385	-0-	-0-	385
	Total	493	-0-	-0-	493
Net LOS[2] Acres Acquired (+) or Conveyed (-)	Wallowa-Whitman	- 467+439= -28	-0-	+4	-467 +413= -54
	Umatilla	-1,315 + 258 = -1,057	-0-	-0-	0-1,315 = -1,315
	Malheur	-423 + 0 = -423	-0-	-0-	0-423 = -423
	Total	-1,508	-0-	+4	-1,792

1) F orest Plan amendments would identify replacement old growth.
2) Net acres of LOS lost includes dedicated old growth from the Wallowa-Whitman and Malheur NFs.

Regional Forester's Sensitive Wildlife Species

Affected Environment

Table 76 contains the R-6 Sensitive reptiles, mammals and bird species that could exist within the analysis area. The entire project area (minimum convex polygon formed by outermost parcels) was the analysis area for the purpose of assessing effects to these sensitive species. Potential effects from this Proposed Land Exchange are discussed to the extent practicable, given that little to no survey or distribution information exists for most of these sensitive species.

Environmental Consequences

Sensitive species habitat suspected to support sensitive species proposed for exchange was used as an indicator of effects to these species. It was assumed that more protective management standards would apply to acquired sensitive species habitat; therefore a beneficial effect would result. It was further assumed that conveyed habitat would come under a less protective set of management standards thereby resulting in a potential negative effect. An estimate was provided as to whether the amount of habitat being acquired would be greater or less than what would be conveyed. Due to the number of sensitive species, the broad range of habitats involved, and the uncertainty of habitat requirements for some species, effects descriptions are very general. These effects are described in terms of increase, decrease, or no change in habitat. A Biological Assessment would be prepared for this proposed project.

The right hand column in Table 76 is labeled "Net Change Federal" which indicates whether there would be a net increase, decrease, or no change in the amount of habitat coming under NF management. An increase (acquired) represents a "positive effect", a decrease (conveyed) represents a "negative effect", and no change represents "no effect". A more in-depth species by species analysis would be of little value because a majority of the R-6 sensitive species are associated with lower elevation marshlands, grasslands, or specific riparian habitats that are absent from or scarcely represented in the Proposed Land Exchange.

Habitat was considered in relatively broad terms when estimating whether habitat would be acquired or conveyed for a particular species. For example, no known peregrine falcon cliffs are included in exchange parcels but abundant habitat suitable for foraging by peregrines would be acquired. This would result in an "increase" rating in Table 76. All sensitive species resulted in either "no change" or an "increase" in habitat being acquired. In all cases, the net increase was substantial, precluding the need to analyze at a finer scale.

Table 76. R-6 Sensitive Reptiles, Mammals and Bird Species Effects Analysis

	Natural Heritage Rank	WA Status	OR Status	Federal Status	Year Desig.	MNF	UNF	WWNF	Net Change Federal
Reptiles									
Chrysemys picta Painted Turtle (OR only)	S2-OR		SC		89		S	S	No Change
Mammals									
Euderma maculatum Spotted Bat (OR only)	S1-OR				00			D	Increase
Gulo gulo California Wolverine	S1S2-WA S2-OR	C			86	D	D	D	Increase
Martes pennanti Pacific Fisher	S2-OR	E	SC	C	00	S		S	Increase
Ovis canadensis Canadensis Rocky Mtn. Bighorn Sheep(OR only)	S2-OR				86		D	D	Increase
Brachylagus idahoensis Pygmy Rabbit	S2-OR S1-WA	E	SV		89	S			Increase
Birds									
Podiceps auritus Horned Grebe (OR only)	S2B-OR		SP		00			S	Increase
Bucephala albeola Bufflehead (OR only)	S2B-OR		SU		00	D		S	Increase

Table 76. R-6 Sensitive Reptiles, Mammals and Bird Species Effects Analysis (continued)

	Natural Heritage Rank	WA Status	OR Status	Federal Status	Year Desig.	MNF	UNF	WW NF	Net Change Federal
Falco peregrinus anatum American Peregrine Falcon	T3	E	E		99	S	S	D	Increase
Centrocercus urophasianus phaios Greater Sage Grouse	N3	T			89	D		S	Increase
Tymphanuchus phasieanellus columbianus Columbia Sharp-tailed Grouse (OR only)	T3 N3	T			00			D	Increase
Bartramia longicauda Upland Sandpiper	S1B	E	SC		89	D	S	D	Increase
Tringa melanoleuca Greater Yellowlegs	S1B-OR				00			S	Increase
Empidonax wrightii Gray Flycatcher	N3B				00	S	S	S	Increase
Agelaius tricolor Tricolored Blackbird (OR only)	G3		SP		00	S		S	Increase
Dolichornyx oryzivorus Bobolink (OR only)	S2B-OR		SV		00	D		S	Increase

Alternatives: 1, 3 & 4: Proposed Exchange, Purchase and Deed Restriction

All action alternatives are similar enough in regard to sensitive species (reptiles, mammals, and bird) to address together. All sensitive species would experience an increase or no change in habitat coming under more protective management standards. These alternatives would potentially benefit most sensitive species and would not result in a trend toward Federal listing or a reduction in species viability. The action alternatives ranked in order of greatest to lowest potential benefit to these sensitive species are: 1, 4, and 3 based on the amount of increase of habitat coming under more protective management standards.

Alternative: 2 No Action

This alternative would not result in a trend toward Federal listing or a reduction in species viability for any R-6 sensitive species. However, this alternative would forego opportunities to acquire and potentially restore habitat for several sensitive species.

Recreation

This section addresses the effects of the proposed Blue Mountain Land Exchange on the existing social character and recreational setting. It discusses recreational opportunities and experiences affected by all alternatives evaluated in detail. The analysis area includes all of the parcels being considered in the Proposed Land Exchange along with adjacent NFS lands. This includes general forest areas, as well as Wilderness, Wild and Scenic River corridors, roadless areas, National Recreation Areas, and other recreation areas used for big game hunting and dispersed camping. Discussion revolves around four topics: Recreation Opportunity Spectrum (ROS), Access, Recreational Facilities and Uses, and Special Designated Areas.

The Proposed Land Exchange would result in access changes that affect the recreation environment. Assumptions were made to disclose likely indirect and cumulative effects to the recreation resource. The following assumptions are based on responses to questionnaires about anticipated management plans for conveyed and acquired parcels.

- Roads on acquired parcels that are currently closed to public access would continue to remain closed. Most roads being conveyed to private ownership would have some type of restriction for access, either a gated entry, the need for written or oral permission, or a combination of these.
- Some conveyed parcels would not be open to public access. Any public that accessed these parcels when in public ownership would have to readjust their recreation plans to avoid trespassing.
- Those acquired parcels that currently have public access restrictions would have the same restrictions when brought into Federal management.

Where specific recreation concerns or opportunities are discussed in detail, parcel numbers or landmark areas will be identified. While all parcels in the Proposed Land Exchange have the potential to support some amount and type of outdoor recreation activity, not all parcels are mentioned in this section.

Laws and Regulations Applying to the Analysis

All parcels are subject to recreation management direction related to their respective Forest Plans, Wild and Scenic River Management Plans and the Hells Canyon National Recreation Area Comprehensive Management Plan.

The Wild and Scenic Rivers Act of 1968 defined the policy of the US: …That certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.

The 1993 *Eagle Creek Wild and Scenic River* Management Plan directs managers to manage the Wild Segment for a Primitive Wilderness Recreation Spectrum, the Scenic Segment for a Semi-primitive Motorized ROS setting, and the Recreational Segment for a Roaded Natural ROS setting. This plan also states that landownership patterns will be similar to what existed at the time of designation but a few private land parcels however could be purchased from willing sellers. The 1993 *Imnaha Wild and Scenic River* Management Plan states that the Scenic Segment will be managed initially for a Semi-primitive Motorized setting, the Recreational segment will be managed for a Roaded Natural ROS, and the Wild segment will be managed for a Semi-Primitive Nonmotorized ROS for the lower segment and for a Primitive Wilderness Recreation Setting for the upper segment. This plan also directs managers to retain

all Federal land unless for the protection and enhancement of the outstandingly remarkable values (ORVs), water quality, or free flow. The 1993 *North Fork John Day Wild and Scenic River* Management Plan directs the management of the Wild Segment for a Primitive or Semi-primitive setting using the Wilderness Recreation Spectrum, the Scenic Segment for a Semi-primitive Motorized or Semi-primitive Motorized ROS setting, and the Recreational Segment for Roaded Natural or Semi-primitive when overlapped with the Wilderness. This plan directs managers to acquire private land within the corridor with a willing seller. Also, all Federal land is to be retained in public ownership unless it is determined to be in the interest of the protection and enhancement of the ORVs, water quality, or free flow.

Parcels within the HCNRA are subject to the 2003 HCNRA CMP. This CMP provides management direction to pursue acquisition of private land or land exchanges as opportunities are available to meet the objectives for which the HCNRA was established.

Affected Environment

Variety in the analysis area landscape provides the backdrop for an array of recreation activities pursued by the public. Dispersed recreation activities, such as hunting, hiking, fishing, and camping are the most popular in this rural setting. Some areas draw more use than others, such as Hells Canyon National Recreation Area, Eagle Cap Wilderness and the various rivers, lakes and streams. High recreation use throughout the analysis area coincides with the summer camping season (approximately Memorial Day through Labor Day) and during the fall big-game hunting seasons from early September through late November. Some of the Imnaha River parcels are used year-round. Specific use figures by recreation activity are not available at this time.

Activities in parcels that are adjacent to water are the most popular amongst the average visitor, since they provide the best overall scenic quality and many other recreation opportunities. These parcels are primarily found in the Imnaha River drainage area.

Both acquired and conveyed parcels provide opportunity for dispersed recreation activities. Most parcels are upland in character. A majority of the dispersed sites on parcels are large, providing for families or group camping opportunities. Dispersed sites are located primarily within pine stands, with some in mixed conifer and riparian vegetation. Over the years, the popularity of these sites has increased. This increased use can put at risk the solitude and quiet character of lesser-used areas. Road development (planned and user-made) has made access easier to remote areas. Both day and overnight recreational use has degraded to varying degrees the soil and vegetative resources in dispersed settings. The heavy use sites show impacts through a loss or degradation of vegetation, soil compaction, sanitation problems (litter, water pollutants, etc.), and a change in site character (e.g. crowding and loss of scenic quality). These conditions can be seen at the most remote locations but they are more apparent in large dispersed sites with high use.

Recreation Opportunity Spectrum (ROS)

ROS is a framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences have been arranged along a continuum or spectrum divided into seven classes: Primitive, Semiprimitive Nonmotorized, Semiprimitive Motorized, Roaded Modified, Roaded Natural, Rural, and Urban. During the three Forest's Planning efforts, ROS settings were designated for various areas. These Forest Plans have definitions for each class. In general, area classes at the developed end of the spectrum are more available to recreationists than classes at the primitive end of the spectrum. Wilderness managers have adapted a more specialized version of the ROS spectrum using the Pristine, Primitive, and Semiprimitive Nonmotorized classes.

Two existing uses influence the ROS for exchange parcels: Off-Highway Vehicle (OHV) use and private road construction in support of associated activities such as logging. These activities modify the vegetation, access, and social settings which determine an area's ROS setting. Sales and use of OHVs have been on a dramatic increase in the last 10 years. This increased use is noticeable in formerly remote and isolated areas in the Blue Mountains. Although OHV use is restricted to designated routes in individual and/or seasonal closure areas on much of the analysis area, OHV use in thousands of areas is not regulated. This unregulated use has contributed to the creation of user trails and an increase in noise levels that could move some of the Primitive and Semi-primitive ROS settings toward the motorized and Roaded Modified end of the spectrum. The FS has drafted a National Policy on OHV use which is published for public review. A final policy is expected to direct land managers to conduct an analyses for designating suitable OHV routes and areas. The desired condition would result in OHV use prohibited in cross county travel except for designated routes and areas. Within the next 5 to 10 years, it is anticipated OHV use on NFS lands would become fully regulated and less likely to cause shifts in ROS settings.

Access

Roads within the analysis area provide access for a variety of activities such as driving for pleasure, off-road vehicle driving, big game hunting, forest product gathering, and wildlife viewing. There is an array of viewpoints on where and how many open roads should be retained. Overall, maintaining open roads is a strong desire with many of the publics contacted in the field. Many long-time visitors to the area feel that too many roads have been closed in the past. They would like to see more "balance" in road management; i.e., access for the public should be given as much importance as other issues in closure proposals. Other Forest visitors believe that road closures are necessary to maintain wildlife habitat, reduce impacts to vegetation, and minimize impacts to soils and water quality. Refer to the Transportation section for additional specific information on roads and road access associated with exchange parcels.

Until the FS addresses recreation and access issues through future planning efforts, competition for camping areas that remain under Federal management could increase in some locations. This situation would occur in the more popular areas associated with water-based recreation or big game hunting camps where frequently used campsites are conveyed. This effect would be minimal for a majority of visitors and recreationists within the analysis area, as a whole, but an increase in localized impacts could occur in some areas. Some recreationists believe historical use of campsites implies ownership of that site for the duration of a big game hunting season. In areas of decreasing public ownership, displaced parties could be viewed as "trespassing" if they transfer their camp to a site historically used by others. At the least, this would affect the satisfaction of both parties camping experience. At the most, confrontations between the parties could occur.

When considering dispersed campers with motor vehicles that would be displaced from conveyed areas and/or campsites, it's likely some would take one of the following actions:

- Use less frequented campsites near where they camped in the past.
- Develop new sites and access roads in the area near where their old camp was.
- Camp and recreate at another location other than their "traditional" camping area.
- Breach road closures or property lines to access campsites.

There are a variety of non-motorized summer trails and motorized winter trails in the analysis area. They provide a moderate to challenging range of opportunities for the recreationalist. Opportunities include mountain bike trails, short day use hikes, multi-day pack and horseback trips, and snowmobile trails that access more remote or lesser-traveled areas during the winter season. Shorelines and areas associated with viewpoints have been impacted from the development of user trails. In some cases, trail maintenance has rehabilitated user trails and associated impact areas. In others, trails lack maintenance due to the backlog

of trail work that needs to be accomplished. In general, the trails are in good condition within the analysis area.

Some trails cross private lands and are not marked or maintained because they do not have Federal right-of-way easements. This situation has caused dissatisfaction and/or confusion with some visitors as they are under the perception that the trail is a public land facility under NF management. This problem is occurring primarily on the Wallowa-Whitman National Forest and to a lesser degree on the Malheur National Forest.

Recreational Facilities and Uses

There are no developed recreation facilities or campgrounds in the analysis area. Recreational activities within exchange parcels are not associated with maintained structures such as toilets, picnic tables, metal fire rings, or bulletin boards.

Special Designated Areas

Several proposed exchange parcels are adjacent to or within special designated areas. These areas include Wild and Scenic River Corridors, Wilderness, Inventoried Roadless Areas, and a National Recreation Area.

Wild and Scenic River Corridors

Congress under the 1968 National Wild and Scenic River Act and subsequent 1988 Oregon Ominbus Rivers Act designated the three wild and scenic rivers with exchange parcels in or adjacent to their corridors. Although the Wild and Scenic Rivers Act does not change private land rights, private landowners must abide by county and state regulations, which in most cases meet or exceed wild and scenic river management recommendations. This analysis tiers to the Wild and Scenic River Management Plans. For specific information on these Plans, refer to the PR.

Eagle Creek Wild and Scenic River
The corridor is 28.9 miles long and is located on the Wallowa-Whitman National Forest. This river has 3 distinct classifications: Wild; 4.5 miles; Scenic; 6.0 miles and Recreational; 18.4 miles. The corridor provides a wide variety of recreational opportunities both in and outside of the Eagle Cap Wilderness. Eagle Creek receives considerable use in the late spring as soon as the snow melts. This use continues into the late fall hunting seasons. A large portion of the visitors are from the local area, although significant use is by regional visitors. Users are drawn to the area both for it's distinction as a wild and scenic river corridor as well as its portal access to the Eagle Cap Wilderness. The Main Eagle Trailhead at Boulder Park serves as the major south side access route into the Eagle Cap Wilderness. This portal is less congested than the northern portals. This corridor offers exceptional scenery in a remote rustic setting with a broad range of available recreational opportunities. Dispersed camping associated with fishing, hunting, and prospecting is by far the heaviest use, evidenced by the numerous dispersed campsites within the corridor. The corridor however does have 8 developed recreation sites including trailheads, developed campgrounds, horse camps, and a fee recreation cabin which are seasonally popular. Other recreation opportunities in the drainage include horseback riding, photography, recreational gold panning, nature study, swimming, wildlife viewing, berry and mushroom picking, and various winter sports such as cross country skiing and snowmobiling. Hazardous in-stream obstacles (logs, brush), waterfalls, and low seasonal flows preclude floating or kayaking opportunities. Outstandingly Remarkable Values (ORVs) for Eagle Creek include; recreation, scenic, fisheries, historic cultural resources, and geology/paleontology.

Imnaha Wild and Scenic River
The corridor is 77 miles long and is located on the Wallowa-Whitman National Forest. The river has 3 distinct classifications: Wild; 6.0 miles; Recreational; 58.0 miles and scenic; 4.0 miles. The uniquely

diverse landscape along the Imnaha River begins at the subalpine headwaters in Eagle Cap Wilderness and ends along the lush riparian habitat abutting the steep rugged canyon walls and grassy plateaus near the Snake River. Recreation in the upper section is both dispersed and developed. The dispersed use is mainly wilderness backpacking, hiking and riding/packing use with some hunting camp use outside the wilderness boundary. Immediately below the wilderness boundary are 5 NF campgrounds and one trailhead, which are very popular in the summer through fall seasons. In contrast, developments in the lower non-forested section are mostly associated with historic ranch settlements and depict a rural western setting. Many of the private lands along the river are integral to the working ranches and serve as base of winter livestock and haying operations. This portion of the corridor portrays a lifestyle dominated by a ranching/farming tradition that has evolved since the days of the pioneers. While the recreational activities along the river include hunting, fishing, sightseeing, horseback riding, hiking, snowmobiling, skiing, and camping, it is also regionally known for two other activities. The first is its role as a side route off of the Hells Canyon All-American Road which is a nationally recognized scenic byway. Although not part of the national byway system, it is a Forest Scenic Byway link and provides an alternative to those wishing to go to Hat Point or extend their trip to Enterprise via the town of Imnaha. A second attraction to the area is the salmon and steelhead fishing. In recent years, the State has opened a fishing season on the Imnaha River for both steelhead and salmon which attracts regional anglers. Since much of the lower river is on private property, including the bed and banks, recreational opportunities are mostly limited to sightseeing and photography from the County Roads. ORVs for the Imnaha River include; recreation, wildlife, scenery, fisheries, cultural resources, historic/prehistoric, traditional values/lifestyles adaptation and vegetation/botanical.

North Fork John Day Wild and Scenic River
The corridor is 54.1 miles long and resides in both the Umatilla and Wallowa-Whitman National Forests. The river has 3 distinct classifications: Wild; 27.8 miles; Scenic; 10.5 miles and Recreational; 15.8 miles. Originating in the upper unit of the North Fork John Day Wilderness, it again enters the lower main portion of wilderness. Along its corridor are 4 trailheads, 5 campgrounds, and a recreation rental cabin. In character with a wild and scenic river corridor and wilderness portal, the developments have mostly rustic characteristics. Portions of the river are designated within the Blue Mountain and Elkhorn State Scenic Byways. Recreation in the corridor is a mixture of dispersed and developed activities. They include hunting, fishing, sightseeing, horseback riding, hiking, snowmobiling, skiing, and camping. The river corridor supports an anadromous fishery. The ORVs for the river are recreation, scenic, historic cultural resources, wildlife, and fisheries.

Wilderness

This Proposed Land Exchange includes parcels that would be acquired in two wilderness areas, Eagle Cap Wilderness and Hells Canyon Wilderness.

Eagle Cap Wilderness
This wilderness lies in the heart of the Wallowa Mountains and is characterized by high alpine lakes and meadows, bare granite peaks and ridges, and U-shaped glaciated valleys. Hikers and horseback riders can choose from over 500 miles of trails into the area which is the largest contiguous wilderness in Oregon. Over 25 trailheads are located on all sides of the wilderness, providing access from Wallowa, Union, and Baker counties. Frequently visited locations include: the Lakes Basin, Minam River, Imnaha River, Hurricane Creek, and both forks of the Wallowa River.

Hells Canyon Wilderness
This wilderness was designated in 1975 as a part of the HCNRA. It is one of three distinct “areas” in the NRA. The other two are the Wild and Scenic Snake River, and the non-wilderness uplands found in both Idaho and Oregon. The Hells Canyon Wilderness, located in Idaho and Oregon, has similar features on

both sides of its Snake River border. Steep slopes, benches, and canyon walls that drain into the Snake River primarily characterize the wilderness area. The stunning scenery and dramatic vistas draw visitors from around the world to view this geographic wonder. The vegetation in the canyon is native bunchgrasses and shrubs with ponderosa pine and Douglas fir scattered in the upper elevations and in the canyon's north slopes and stream bottoms. Many of the hundreds of miles of trail follow traditional routes along canyon benches or drainage bottoms, and can remain open yearlong in some of the lower elevations. Higher elevations however are inaccessible until later in the summer due to snow throughout much of the year. Overall, both access roads and trails begin to open in June and remaining open until October or November.

Wilderness areas have characteristics such as size, opportunity for solitude, and a landscape that have retained primeval character and influence without permanent improvement or human habitation. Overall, lands added to wilderness tend to enhance this character.

Inventoried Roadless Areas

The analysis area contains ten Inventoried Roadless Areas: Tope Creek, Buckhorn, Snake River, Imnaha Face, Sheep Divide, Deadhorse and Hurricane Ridge on the Wallowa-Whitman National Forest; W-T Three and Horseshoe on the Umatilla National Forest; and Nipple Butte, Shaketable, and Aldrich Mountain on the Malheur National Forest.

Inventoried Roadless Areas were identified in the national Roadless Area Conservation Strategy analysis.

Inventoried Roadless Areas on the Wallowa-Whitman National Forest either occur in the steep canyons of the Imnaha River and Grande Ronde River systems or the steep slopes of the Wallowa Mountains. As such, the areas are utilized mostly for sightseeing, hunting, and hiking. Inventoried Roadless Areas on the Malheur are generally on gentle slopes, uplands and plateaus and used primarily for big game hunting. On the Umatilla National Forest, Inventoried Roadless Areas occur where the terrain is generally steep and rugged. Recreation use is primarily big game hunting and sightseeing.

National Recreation Area (NRA)

The analysis area contains the Hells Canyon National Recreation Area (HCNRA) which is administered by the Wallowa-Whitman National Forest. Most of the parcels in the Imnaha drainage area are also within the HCNRA. The principal physical feature of the HCNRA is Hells Canyon. Where developed areas exist, they are rich in nature and are often associated with homesteads or old mining sites. Recreation opportunities within the HCNRA are emphasized by the 1975 HCNRA Act, provided that they are compatible with the other components for which the HCNRA was designated. Recreation use in this area is widely variable. The area is noted for rugged landscape and ecological diversity found in the Hells Canyon uplands and Wilderness and for the 180 plus miles of wild and scenic rivers. Due to this remote landscape, many users are drawn to the area for the abundance of relatively unroaded areas and highly controlled motorized vehicle access.

Environmental Consequences

The following describes the anticipated environmental consequences on Recreation Opportunity Spectrum, Access, Recreational Facilities and Uses, and Specially Designated Areas.

Recreation Opportunity Spectrum (ROS)

Alternative 1: Proposed Exchange

Table 77 displays the approximate acres of ROS designation for the conveyed and acquired parcels in the Proposed Land Exchange by forest. The acquired parcels were assumed to have the same ROS class as the closest representative NFS lands.

Table 77. Alternative 1- ROS Class Acres for Conveyed and Acquired Parcels by

ROS Class	MNF (acres)		UNF (acres)		WWNF (acres)		Net Change (acres)
	Acquired Parcels	Conveyed Parcels	Acquired Parcels	Conveyed Parcels	Acquired Parcels	Conveyed Parcels	
Primitive	0	0	40	0	201	0	+241
Semi-Primitive Non-motorized	0	216	0	0	2023	1215	+592
Semi-primitive Motorized	2889	697	0	288	3507	762	+4649
Roaded Natural	2856	2241	8354	5070	6941	3048	+7792
Roaded Modified	401	2611	4012	2007	0	0	-205
Rural	0	0	0	14	491	14	+463
Urban	0	0	0	0	0	0	0
Total	**6146**	**5765**	**12,406**	**7379**	**13,163**	**5039**	**+13,532**

Alternative 1 would result in a net increase of all ROS class acres except for a reduction of 205 acres in Roaded Modified. The largest increases occur in Semi-primitive Motorized (4,649 acres) and Roaded Natural (7,792 acres).

Future potential changes in ROS class revealed in the Affected Environment discussion would occur under Alternative 1. Once increased regulation of OHV use begins, the cumulative effect trend towards changes in ROS class after the Proposed Land Exchange would stop.

Alternative 2: No Action

The current mix of ROS classes would not immediately change. Future potential changes in ROS class revealed in the Affected Environment discussion would occur under Alternative 2. Once increased regulation of OHV use begins, the cumulative effect trend towards changes in ROS class would stop.

Alternative 3: Purchase

Table 78 displays the approximate acres of ROS designation for the purchased parcels by forest. The purchased parcels were assumed to have the same ROS class as the closest representative NFS lands.

Table 78. Alternative 3- ROS Class for Purchased Parcels by Forest

ROS Class	Increase in Area (acres)			
	MNF	UNF	WWNF	Total
Primitive	0	40	201	+241
Semi-Primitive Nonmotorized	0	0	702	+702
Semi-Primitive Motorized	0	0	711	+711
Roaded Natural	0	190	1593	+1783
Roaded Modified	0	343	0	+343
Rural	0	0	445	+445
Urban	0	0	0	0
Total	**0**	**573**	**3652**	**+4,225**

Alternative 3 would result in a net increase of all ROS class acres. The largest increase would occur in Roaded Natural (1,783 acres), most of which would be on the Wallowa-Whitman National Forest. Future potential changes in ROS class would occur as described in the Affected Environment discussion.

Alternative 4: Deed Restriction

Table 79 displays the approximate acres of ROS designation for Alternative 4 by forest. The acquired parcels were assumed to have the same ROS class as the closest representative NFS lands.

Table 79. Alternative 4- ROS Class for Conveyed and Acquired Parcels by Forest

ROS Class	MNF (acres)		UMF (acres)		WWNF (acres)		Net Change (acres)
	Acquired Parcels	Conveyed Parcels	Acquired Parcels	Conveyed Parcels	Acquired Parcels	Conveyed Parcels	
Primitive	0	0	40	0	201	0	+241
Semi-Primitive Non-motorized	0	216	0	0	2023	1215	+592
Semi-Primitive Motorized	0	697	0	288	3423	762	+1676
Roaded Natural	258	2241	4048	5070	4633	3048	-1420
Roaded Modified	22	2611	1957	2007	0	0	-2639
Rural	0	0	0	14	491	0	+477
Urban	0	0	0	0	0	0	0
Total	**280**	**5765**	**6045**	**7379**	**10,771**	**5025**	**-1073**

Alternative 4 would result in a significant net decrease (4,059 acres) of ROS class Roaded Modified and Roaded Natural. The Wallowa-Whitman National Forest would realize a net increase in all ROS classes except for the Roaded Modified class, which would not be affected. The Umatilla and Malheur National Forests would both loose ROS class acres. Future potential changes in ROS class would occur as described in the Affected Environment discussion.

Summary- All Alternatives

Table 80 compares net change in ROS class by alternative. The Urban ROS class is not affected by the alternatives evaluated in detail. Alternative 1 has a net increase of 13,532 acres in ROS classes. This increase is over three times the net increase of Alternative 3. Alternative 4 has a net ROS class decrease of 1,073 acres.

Alternative 1 would realize more net acre increase in the developed end of the ROS scale than the other action alternatives by adding 8,050 acres but would also make available an additional 5,482 acres of recreation opportunity at the more primitive end of the scale. Alternative 3 would also realize more net increase in the developed end of the ROS scale but contributes significantly less recreation opportunity at both ends of the scale than Alternative 1. Alternative 4 would realize a net increase of 2,509 acres at the primitive end of the scale but would result in a loss of 3,582 acres at the developed end of the ROS scale.

Table 80. Comparison of Net Changes in ROS Class Acres by Alternative

ROS Class	Net Change in Area (acres)			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Primitive	+241	0	+241	+241
Semi-Primitive Non-motorized	+592	0	+702	+592
Semi-Primitive Motorized	+4,649	0	+711	+1,676
Roaded Modified	-205	0	+1,783	-2,639
Roaded Natural	+7,792	0	+343	-1,420
Rural	+463	0	+445	+477
Urban	0	0	0	0
Total	13,532	0	4,225	-1,073

Access

Refer to Table 81 road status exchange miles in each forest by alternative and Table 82 total road miles of open, closed and no change by alternative for the following alternative comparison discussion.

Table 81. Roads to Be Acquired, Conveyed, or No Change in Each Forest by Alternative

Road Status	Alternative 1			Alternative 3			Alternative 4		
	Total Roads	Closed Roads	Open Roads	Total Roads	Closed Roads	Open Roads	Total Roads	Closed Roads	Open Roads
Malheur National Forest									
Roads Acquired (miles)	18.5	7.7	10.8				0	0	0
Roads Conveyed[1] (miles)	35.6	24.2[1]	11.3[1]				35.6	24.2[1]	11.3[1]
Roads With No Change (miles)	18.3	3.2	15.1				8.1	2.7	5.4
Totals (miles)	**72.4**	**35.1**	**37.2**				**43.7**	**26.9**	**16.7**
Umatilla National Forest									
Roads Acquired (miles)	47.1	24.8	22.3	3	3		27.4	19.1	8.3
Roads Conveyed[1] (miles)	20.1	13.5[1]	6.6[1]				20.1	13.5[1]	6.6[1]
Roads With No Change (miles)	24.8	4.1	20.7	2.5	0.9	1.6	19.7	4.1	15.7
Totals (miles)	**92.0**	**42.4**	**49.6**	**5.5**	**3.9**	**1.6**	**67.2**	**36.7**	**30.6**
Wallowa-Whitman National Forest									
Roads Acquired (miles)	35.4	16.2	19.2	5.5	4.8	0.7	25.6	13.4	12.2
Roads Conveyed[1] (miles)	3.8	0.1[1]	3.7[1]				3.8	0.1[1]	3.7[1]
Roads With No Change (miles)	23.2	4.4	18.8	6.5		6.5	21.2	3.3	17.9
Totals (miles)	**62.4**	**20.7**	**41.7**	**12**	**4.8**	**7.2**	**50.6**	**16.8**	**33.8**
Grand Total	**226.8**	**98.3**	**128.5**	**17.5**	**8.7**	**8.8**	**161.5**	**80.4**	**81.1**

1) On roads being conveyed, the above table shows the number of miles which are currently open versus currently closed. Following conveyance, whether the road remains open or closed, would be at the discretion of the receiving private party.

Table 82. Miles of Conveyed and Acquired Open and Closed Roads by Alternative

Road Status	Alternative 1			Alternative 3			Alternative 4		
	Total	Closed	Open	Total	Closed	Open	Total	Closed	Open
Total Acquired (miles)	101	48.7	52.3	8.5	7.8	0.7	53	32.5	20.5
Total Conveyed (miles)	59.5	37.8	21.6	0	0	0	59.5	37.8	21.6
Total no change (miles)	66.3	11.7	54.6	9	0.9	8.1	49	10.1	39
Total (miles)	**226.8**	**98.3**	**128.5**	**17.5**	**8.7**	**8.8**	**161.5**	**80.4**	**81.1**

Alternative 1: Proposed Exchange

Alternative 1 would have beneficial effects to recreationists from increased access associated with acquired parcels. In many cases, public access to or through parcels would not change because the access is a public route (County, State, or Federal), the NF currently has a right-of-way, or the NF would reserve a right-of-way as a condition of the conveyance. Public access on 66.3 miles of road would not change under this alternative. An additional 59.5 miles of road would be conveyed, and approximately 101 miles of road would be acquired. The net effect of this alternative on road access to NFS lands would be a substantial increase associated with the 101 miles of roads on acquired parcels accompanied by a minimal decrease associated with the 59.5 miles of roads on conveyed parcels. This decrease in access on the conveyed parcels would be minimal because none of these 59.5 miles of road provide through access to NFS lands. Any route that provides through access to NFS lands would have a right-of-way retained as a condition of the conveyance. The 59.5 miles of conveyed roads would be subject to landowner permission for public access.

In some cases, roads on parcels that would be acquired have been used under prescriptive rights to access adjacent NF parcels. Acquiring the roads and parcels would resolve these unperfected public access issues.

The parcels in the Hamilton Ridge area, FM15 (325 acres), FM16A (246 acres), FM16B (82 acres), FM17 (596 acres), FM18 (480 acres), FM19 (309 acres) and FM20 (41 acres) are popular among residents of Monument, Hamilton, and Long Creek for firewood gathering and big-game hunting. Recreation activities would no longer be available to the public within these areas, primarily affecting residents of Hamilton and Monument. However, public access on routes 4020-201, 4020-204, 4020-205, and 4020-206 would be retained, allowing access to NFS lands beyond Parcel FM17. Some acquired parcels on the Malheur National Forest would provide additional opportunities for big game hunting opportunities and firewood gathering for local residents of Fox and Long Creek. Parcels PM15 (80 acres), PM16 (124 acres), PM17 (162 acres), PM18 (481 acres), PM19 (628 acres), and PM20 (483 acres) would provide these types of opportunities to some of the local communities. On the Umatilla National Forest, Parcel FU25 (39 acres) is a popular elk hunting area among local residents. There is a concern that this area would become a fee hunting area if it is transferred to private ownership. It was assumed that under Alternative 1, motorized public access would be restricted to Forest Road 5300, and hunting opportunities on the 39 acres could be lost for the general public. However, most hunters in the area utilize Forest Road 5326, which is just south of Parcel FU25 for access to the adjoining National Forest.

This alternative provides opportunities to resolve trail right-of-way issues. On the Wallowa-Whitman National Forest, a total of 5.7 miles of trail are located on acquired parcels. This includes portions of Trails 1698, 1710, 1724, 1732, 1738A, 1753, 1768, 1820, and 1879. On the Malheur National Forest, approximately 1 mile of trail is located on acquired parcels (Trails 258 and 259). On the Umatilla National Forest, approximately 0.57 miles of trail are located on acquired parcels (Trails 3246 and 3247). Most of these trails were established through long-term use and were not accompanied by recorded rights-of-way for public use. Alternative 1 completely resolves public access issues for Trails 1732 (Bench Trail near Spain Saddle), 1820 (South Fork Imnaha River Trail at Hawkins Pass), 1698 (Corral Creek Trail), 1753 (Falls Creek Trail), and 1768 (Cayuse Flat Trail). Public access through the acquired parcels that cross these trails has been by prescriptive rights in the past. Acquiring parcels bisected by Trails 1710 (Horse Creek Trail), 1724 (Spain Saddle to Tulley Creek), and 1738A (Haas Hollow) on the Wallowa-Whitman would resolve some of the public access issues associated with these trails. These trails bisect other private parcels that are not included in the Proposed Land Exchange. Public access on the private lands not included in the Proposed Land Exchange would continue to be an issue because no public right-of-way exists. Conveyed parcels in Alternative 1 have no FS system trails.

Long-time users (especially campers and those driving for pleasure) would loose recreation opportunities on conveyed parcels, although they would continue to be able to drive on existing roads where rights-of-ways would be retained on routes to NFS lands. Some recreationists who would prefer to use sites or areas they are familiar with, or have traditionally used for camping or other activities may be forced out of conveyed areas. These convey parcels may have new access restrictions.

Alternative 2: No Action

Access to Federal and private lands would remain the same. Changes to public access on Federal parcels would evolve from other projects (i.e., timber sales, etc.). Access on private parcels could be altered if lands were sold or if owners decided to change current access policies. Public access to fishing on the Imnaha River would continue to be very limited.

There would be continued dissatisfaction or confusion of some trail users. This would occur on trails that cross private property where there is no identified route to follow or access is restricted (Refer to discussion in Alternative 1). In some cases, this has resulted in additional trails being developed by the public. The use of trails with no public right-of-way could lead to inadvertent or deliberate trespass on private property. All of these situations are now occurring in the parcels proposed for acquisition in Alternative 1 within the HCNRA and Eagle Cap Wilderness.

Alternative 3: Purchase

Since no Federal land would be conveyed, Alternative 3 would provide the least possible disruption to visitors and recreationists because access would only increase. Dispersed camp sites and other use areas on Federal parcels to convey in Alternative 1 would remain NFS lands. The Hamilton Ridge area and parcel FU25 would remain under Federal management, resulting in continued public firewood gathering and hunting. The FS would manage purchased parcels with the appropriate existing Forest Plans, as amended. The increased access scenarios described in the Alternative 1 effects discussion would occur, but to a considerably smaller extent because 9,320 fewer net acres would be acquired. Public access on 9.0 miles of road would not change under Alternative 3. No miles of road would be conveyed, and approximately 7.8 miles of road would be acquired.

This alternative provides some opportunities to resolve trail right-of-way issues. On the Wallowa-Whitman National Forest, a total of 2.8 miles of trail are located on purchased parcels. This includes portions of Trails 1710, 1738A, 1820, and 1879. On the Malheur and Umatilla National Forests, no parcels with trails would be purchased. Increased public access on the above Wallowa-Whitman trails would resolve some of the similar management problems as described in the Alternative 1 discussion.

Alternative 4: Deed Restriction

This alternative conveys the same parcels as Alternative 1 but acquires 1,053 acres less than would be conveyed. Public access on 49.0 miles of road would not change under this alternative. An additional 59.5 miles of road would be conveyed, the same as Alternative 1. Approximately 53.0 miles of road would be acquired. This alternative acquires approximately half the total acquired miles than would occur under Alternative 1. The net effect of this alternative on road access to the National Forest would be an increase associated with the 53 miles of roads on acquired parcels accompanied by a minimal decrease associated with the 59.5 miles of roads on conveyed parcels. Decrease in access on the conveyed parcels would be minimal for the same reasons explained in the Alternative 1 discussion. Since the same Federal land would be conveyed as Alternative 1, Alternative 4 would likely provide the most disruption to visitors and recreationists. Under this alternative, replacement of dispersed hunting camps and other sites lost to private lands would likely be more difficult to find since there would be a net loss of Federal acres. Alternative 4 conveys the Hamilton Ridge parcels and parcel FU25, therefore the effects on wood gathering and hunting in these areas would be similar to Alternative 1.

This alternative provides opportunities to resolve trail right-of-way issues. On the Wallowa-Whitman National Forest, a total of 5.7 miles of trail are located on acquired parcels. This includes portions of Trails 1698, 1710, 1724, 1738A, 1753, 1768, 1820, and 1879. On the Malheur National Forest, approximately 1 mile of trail is located on acquired parcels (Trails 258 and 259). On the Umatilla National Forest, no parcels with trails would be acquired. Increased public access on NF trails would resolve similar management problems as described in the Alternative 1 discussion except portions of trail 1732 and trails on the Umatilla would not be acquired.

Recreational Facilities and Associated Uses

There are no developed recreation facilities or campgrounds on the exchange parcels therefore no direct effects would occur from any alternative. However, some indirect effects on the existing facilities within the analysis area could occur from action alternatives due to increased trail use. These effects would likely include increased pumping frequency at the Lower Imnaha Trailhead toilet or the need for additional informational signs about trail locations and changes in ownership.

Wild and Scenic River Corridors

Alternative 1: Proposed Exchange

A measurement indicator of the change in Wild and Scenic River Outstandingly Remarkable Values (ORVs) is the net reduction or increase in acres within each wild and scenic river corridor. Table 83 lists Alternative 1 acquired and conveyed parcels in each wild and scenic river corridor.

Table 83. Alternative 1- Acquired and Conveyed Parcels in Wild and Scenic River Corridors

Parcel	Total Parcel (acres)	Parcel Acres Within Wild and Scenic River Corridor		
		Imnaha	North Fork John Day	Eagle Creek
Acquired Parcels				
PW1	11	11		
PW2A	22	22		
PW2B	37	32		
PW10A	63	63		
PW10B	101	101		
PW13A	43	43		
PW13B	83	43		
PW13C	63	63		
PW13D	8	8		
PW16A	39	39		
PW16B	115	80		
PW16C	302	222		
PW16E	162	158		
PW20A	159	129		
PW20B	224	50		
PW20C	151	126		
PW21C	75	20		
PW23B	75	4		
PW25A	186	47		
PW25B	65	45		
PW25C	180	60		
PW25D	175	160		
PW25E	74	35		
PW27A	80	10		
PW27C	127	77		
PW38	311			252
PU16F	343		211	
PU16G	31		31	
PU16H	424		20	
Totals		1,648	262	252
Conveyed Parcels				
FW8	83	40		
Totals		40	0	0

Imnaha Wild and Scenic River
All of the acquired parcels (1,648 acres) in the Imnaha River Corridor would enhance the river's ORVs. One of the main enhancements would include providing angler access that is currently very limited. Additional access would dramatically increase all the recreation opportunities for the general public. Other anticipated benefits would include opportunities to improve visuals and control incompatible access. The Fisheries and Heritage sections also discuss the benefits resulting from a net increase in Federal management along the Imnaha River.

The only conveyed parcel in a wild and scenic river corridor (parcel FW8) would be subject to Oregon State Waterway laws as well as county land use planning allocations and zoning. Also, land use and development would be subject to 36 CFR 292.20 through 292.25, Private Land Use Regulations for the HCNRA. Changes to existing uses or proposals for new uses and/or development would require a "Certificate of Compliance" as defined in 36 CFR 292.24. Also, all existing and proposed uses and/or development on the 40 acres within the corridor would be subject to the Standards and Guides for Private Lands as documented in the Imnaha River Wild and Scenic River Management Plan. The conveyance of 40 acres within the Imnaha River Wild and Scenic River corridor would not detract from the corridor's ORVs. Parcel FW8 is across the Imnaha River from the County Road and has no legal public access. Conveying this parcel would not detract from recreation and fishing ORVs.

North Fork John Day Wild and Scenic River
All of the acquired parcels (262 acres) in this River Corridor would enhance the river's ORVs. No area within the corridor would be conveyed. Positive effects to the river's ORVs include increased access for recreational uses, increased opportunities to manage for improved fish habitat and to protect existing cultural resource sites from disturbance.

Eagle Creek Wild and Scenic River
All of the acquired parcels (252 acres) in this River Corridor would enhance the ORVs. No area within the corridor would be conveyed. Positive effects to the ORVs include increased access for recreational uses, increased opportunities to manage for improved fish habitat and to protect existing cultural resource sites from disturbance.

Alternative 2: No Action

The wild and scenic river corridors would retain the existing ownership pattern. ORVs would be managed in accordance with this ownership pattern and existing laws, regulations and management plans.

Alternative 3: Purchase

Alternative 3 would purchase all parcels within the Wild and Scenic Imnaha River Corridor except for parcels PW16B (80 acres in corridor), PW20B (50 acres in corridor), PW25E (35 acres in corridor) and PW27A (10 acres in corridor). Many of the acquired parcels with land in the Imnaha River corridor would substantially improve access to fishing along the lower river segment. There would be no acres purchased within the Eagle Creek corridor and parcel PU16F (211 acres in corridor) would be purchased in the N. Fork John Day corridor. The effects to ORVs would be similar to those described in Alternative 1 except there would be fewer acres purchased in the Imnaha and N. Fork John Day river corridors and no acres acquired in the Eagle Creek corridor.

Alternative 4: Deed Restriction

Alternative 4 would acquire all parcels within the Wild and Scenic Imnaha River Corridor and the N. Fork John Day River Corridor except Parcel PW38 (252 acres in corridor) would not be acquired in the Eagle Creek River Corridor. Parcel FW8 (40 acres in Imnaha River corridor) would be conveyed as would be the case in Alternative 1. The effects would be similar to those described in Alternative 1, except the

Eagle Creek Corridor would not benefit from adding Federal acres to this corridor. The deed restrictions in this alternative would not greatly influence management options to improve recreational opportunities and ORVs within the river corridors. Existing private land regulations associated with State land use laws and local zoning ordinances adequately protect the rivers' corridors.

Summary- All Alternatives

Table 84 shows the net change in acres within the three affected wild and scenic river corridors. Alternative 1 has the largest acre increase followed by Alternative 4 and then 3. Alternative 1 would provide the most benefit to the public because the additional Federal acres would allow more management options for maintenance and enhancement of the ORVs within the river corridors. The additional acres would also provide increased public access opportunities for enjoyment of the ORVs.

Table 84. Wild and Scenic River Corridor Net Acre Change by Alternative

Alternative 1 (acres)	Alternative 2 (acres)	Alternative 3 (acres)	Alternative 4 (acres)
+2,122	0	+1,684	+1,870

Wilderness

There would be no change to the existing condition under the No Action Alternative. All action alternatives would acquire the same acres within two wilderness areas. Table 85 displays the three parcels that would be acquired within wilderness boundaries. The action alternatives would not conveys parcels within the Eagle Cap and Hells Canyon Wilderness areas.

Table 85. Action Alternatives- Acquired Parcels in Wilderness

Parcel	Total Parcel Size (acres)	Acres Acquired Within Wilderness	
		Eagle Cap	Hells Canyon
PW29	143		143
PW47A	11	11	
PW47B	47	47	
Totals		**58**	**143**

Parcel PW29 would improve trail user satisfaction by connecting trail #1879 that is currently transected by this private land. Similarly, parcels PW47A and B would reduce confusion of trail users in the Eagle Cap Wilderness. Acquiring these parcels would improve and enhance the Wilderness experience and management of this resource. Acquiring lands within these wilderness boundaries is in compliance with the management of each wilderness as well as the Wilderness Act of 1964. Acquisition alleviates any risk of development that would not be in keeping with the adjacent wilderness setting and NF management objectives.

Parcels PW35A, B, and C (458 acres) are directly adjacent to the Eagle Cap Wilderness and could become candidates for future Wilderness additions. These parcels would be acquired in Alternative 1 and 4, but not in Alternative 3.

Inventoried Roadless Areas

Alternative 1: Proposed Exchange

The potential change to Inventoried Roadless Areas can be shown by the net reduction or increase in acres within and adjacent to each Inventoried Roadless Area. Table 86 lists Alternative 1 acquired and conveyed parcels by forest in each roadless area and displays current development status by parcel.

Table 86. Alternative 1- Parcels Adjacent to or Within Inventoried Roadless Areas

Inventoried Roadless Area	Parcel	Acres Within or Adjacent to Inventoried Roadless Area			Current Status
		MNF	UNF	WWNF	
Shaketable	PM30	+641			Roaded
Nipple Butte	PM8B	+109			Roaded
Aldrich Mountain	PM28	+161			Unroaded
Aldrich Mountain	PM29	+44			Unroaded
W-T Three	PU1A		+230		Roaded
W-T Three	PU1B		+521		Roaded
Horseshoe	FU1		-5		Roaded
Hurricane Ridge	PW35A			+229	Unroaded
Hurricane Ridge	PW35B			+153	Unroaded
Hurricane Ridge	PW35C			+76	Unroaded
Hurricane Ridge	FW13			-118	Unroaded
Imnaha Face	PW25E			+74	Roaded
Imnaha Face	PW26B			+157	Roaded
Imnaha Face	PW27A			+80	Unroaded
Imnaha Face	PW26C			+127	Roaded
Imnaha Face	PW28			+119	Unroaded
Imnaha Face	FW7			-121	Unroaded
Imnaha Face	FW8			-83	Roaded
Tope Creek	PW39B			+572	Roaded
Tope Creek	PW39D			+83	Roaded
Tope Creek	PW40			+163	Roaded
Tope Creek	FW25A			-576	Roaded
Tope Creek	FW25B			-59	Roaded
Tope Creek	FW26			-247	Unroaded
Snake River	PW3			+564	Roaded
Snake River	PW4			+40	Roaded
Snake River	PW5			+40	Unroaded
Snake River	PW10A			+63	Roaded
Snake River	PW11			+41	Roaded
Snake River	PW13B			+83	Unroaded
Snake River	PW13C			+63	Unroaded

Table 86. Alternative 1- Parcels Adjacent to or Within Inventoried Roadless Areas (continued)

Inventoried Roadless Area	Parcel	Acres Within or Adjacent to Inventoried Roadless Area			Current Status
		MNF	UNF	WWNF	
Snake River	PW16A			+39	Roaded
Snake River	PW16B			+115	Roaded
Snake River	PW16E			+162	Roaded
Snake River	PW17A			+118	Unroaded
Snake River	PW17B			+399	Roaded
Snake River	PW19A			+21	Unroaded
Snake River	PW19B			+201	Roaded
Snake River	PW19C			+162	Roaded
Snake River	PW22			+41	Unroaded
Snake River	PW26A			+315	Roaded
Snake River	PW26C			+155	Roaded
Snake River	PW48			+233	Roaded
Buckhorn	PW1			+11	Unroaded
Buckhorn	PW6			+9	Unroaded
Buckhorn	PW7A			+83	Unroaded
Buckhorn	PW7B			+244	Unroaded
Buckhorn	PW7C			+118	Roaded
Buckhorn	PW8A			+429	Roaded
Buckhorn	PW8B			+258	Roaded
Buckhorn	PW8C			+39	Roaded
Buckhorn	PW12			+257	Roaded
Buckhorn	PW14			+649	Unroaded
Buckhorn	PW15A			+187	Roaded
Buckhorn	PW15B			+87	Roaded
Buckhorn	PW16C			+302	Roaded
Buckhorn	PW16D			+80	Roaded
Buckhorn	PW18			+41	Roaded
Buckhorn	PW20A			+159	Roaded
Buckhorn	PW20B			+224	Roaded
Buckhorn	PW21A			+81	Unroaded
Buckhorn	PW21B			+76	Unroaded
Buckhorn	PW21C			+75	Roaded
Buckhorn	PW21D			+151	Roaded
Buckhorn	PW23A			+39	Roaded
Buckhorn	PW 23B			+75	Roaded
Buckhorn	FW1D			-325	Unroaded
Buckhorn	FW1E			-127	Roaded
Sheep Divide	PW24A			+67	Roaded

Table 86. Alternative 1- Parcels Adjacent to or Within Inventoried Roadless Areas (continued)

Inventoried Roadless Area	Parcel	Acres Within or Adjacent to Inventoried Roadless Area			Current Status
		MNF	UNF	WWNF	
Sheep Divide	PW24B			+53	Roaded
Sheep Divide	PW24C			+31	Roaded
Sheep Divide	PW24D			+41	Roaded
Sheep Divide	PW25A			+186	Roaded
Sheep Divide	PW25B			+65	Roaded
Sheep Divide	PW25C			+180	Roaded
Sheep Divide	PW25D			+175	Roaded
Sheep Divide	PW31			+183	Roaded
Sheep Divide	FW6A			-42	Roaded
Sheep Divide	FW6C			-43	Roaded
Sheep Divide	FW6F			-41	Roaded
Deadhorse	FW6B			-38	Unroaded
Deadhorse	FW6D			-43	Unroaded
Deadhorse	FW6E			-38	Roaded
Subtotal Roaded Parcels		+750	+746	+6,309	
Subtotal Unroaded Parcels		+205	0	+ 1,284	
Grand Total		**+955**	**+746**	**+7,593**	

Similar to wilderness areas, Inventoried Roadless Areas have intrinsic value of less modified and less accessible landscapes. Acquiring parcels that can contribute to these areas or be rehabilitated to fit the adjacent roadless character could be beneficial to the roadless character.

Alternative 1 would add the greatest area within or directly adjacent to Inventoried Roadless Area boundaries when compared to the other alternatives. A net total of 9,294 acres of parcels within or adjacent to IRAs would be acquired. Of this total, 84 percent (7,805 acres) involves area that is currently roaded. Therefore, a corresponding increase in area exhibiting roadless character would not necessarily occur. Acquisition of parcels adjacent to the Aldrich Mountain and Hurricane Ridge IRAs are examples where roadless character would increase because the acquired parcels are currently unroaded. The Wallowa-Whitman National Forest would acquire the greatest amount of area within or adjacent to IRAs with a net total of 7,593 acres acquired. Of these acres, 6,309 acres are currently roaded and 1,284 acres are unroaded.

Alternative 2: No Action

With no lands being exchanged, there would be no change to the Inventoried Roadless Areas.

Alternative 3: Purchase

Alternative 3 would result in a net increase of 3,060 acres of parcels within or adjacent to roadless areas on the Wallowa-Whitman National Forest. Approximately 85 percent of the area associated with this

increase (2,586 acres) is already roaded, so this increase would not necessarily increase the expanse of area that actually contains roadless character.

On the Malheur National Forest, Alternative 3 would not involve parcels within or adjacent to IRAs. On the Umatilla National Forest, 230 acres within or adjacent to the W-T Three IRA would be acquired and 5 acres within or adjacent to the Horseshoe IRA would be conveyed. These changes would be negligible with respect to the entire IRA sizes. These parcels are also already roaded; therefore, their acquisition or conveyance would not influence the continuity of areas that actually contain roadless character. The Recreation Specialist Report in the PR lists all Alternative 3 parcels purchased in or adjacent to IRAs.

Alternative 4: Deed Restriction

Alternative 4 would be the same as Alternative 1 with respect to Inventoried Roadless Areas on the Wallowa-Whitman National Forest, except that a net reduction of 882 acres (parcels FW 25A, FW25B, and FW26) would occur with the Tope Creek IRA. This alternative would result in a 10 percent decrease in the size of the 8,674-acre Tope Creek Roadless Area. Parcels FW25A and FW25B (635 acres) contain roads, while Parcel FW26 (247 acres) does not. Therefore, not all of these conveyed acres would have roadless character.

On the Malheur National Forest, Alternative 4 would not involve parcels within or adjacent to IRAs. On the Umatilla National Forest, 230 acres within or adjacent to the W-T Three IRA would be acquired and 5 acres within or adjacent to the Horseshoe IRA would be conveyed. These changes would be negligible with respect to the entire IRA sizes. These parcels are also already roaded; therefore, their acquisition or conveyance would not influence the continuity of areas that actually contain roadless character. The Recreation Specialist Report in the PR lists all Alternative 4 parcels conveyed and acquired in or adjacent to IRAs.

Summary- All Alternatives

Alternative 1 would result in the largest increase within or adjacent to IRAs (Table 87). Alternative 4 would result in an increase of 7,000 acres and Alternative 3 an increase of 3,060 acres within or adjacent to IRAs.

IRAs have intrinsic value of less modified and less accessible landscapes. The majority of acres added by each of the action alternatives are roaded therefore most of these acres would not have roadless characteristics.

Table 87. Net Change in Inventoried Roadless Areas by Alternative

Inventoried Roadless Area	Net Change in Acres Within or Adjacent to Inventoried Roadless Areas			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Shaketable	+641	0	0	0
Nipple Butte	+109	0	0	0
Aldrich Mountain	+205	0	0	0
W-T Three	+751	0	+230	+230
Horseshoe	-5	0	0	-5
Hurricane Ridge	+340	0	0	+340
Imnaha Face	+353	0	+246	+353
Tope Creek	-64	0	0	-882
Snake River	+2855	0	+1088	+2855
Buckhorn	+3373	0	+1120	+3373
Sheep Divide	+855	0	+606	+855
Deadhorse	-119	0	0	-119
Total	**+9,294**	**0**	**+3,290**	**+7,000**

National Recreation Areas

Alternative 1: Proposed Exchange

Alternative 1 would acquire 8,199 acres and convey 695 acres of area within the HCNRA (Table 88). Most of the parcels in the Imnaha drainage area are also within the HCNRA and would add to this management area. Similar to Inventoried Roadless Areas or wilderness areas, additional acreage serves to provide additional recreational and stewardship opportunities as previously described.

Alternative 2: No Action

With no lands being exchanged or purchased, there would be no change to ownership or recreation opportunities in the HCNRA.

Alternative 3: Purchase

Alternative 3 would purchase 3,529 acres and convey no area within HCNRA. The beneficial aspects for acquiring parcels within the HCNRA identified in Alternative 1 would be applicable in Alternative 3 as well, but at a significantly decreased scale because about 4,000 fewer acres would be acquired.

Alternative 4: Deed Restriction

Alternative 4 would acquire and convey the same area within the HCNRA as Alternative 1. The effects are the same as Alternative 1.

Table 88. HCNRA Acres Conveyed and Acquired by Alternative

Parcel	Acres	Acres within HCNRA			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Parcels Acquired					
PW1	11	11	0	11	11
PW2A	22	22	0	22	22
PW2B	37	37	0	37	37
PW2C	2	2	0	0	2
PW3	564	564	0	0	564
PW4	40	40	0	0	40
PW5	40	40	0	0	40
PW6	9	9	0	0	9
PW7A	83	83	0	0	83
PW7B	244	244	0	0	244
PW7C	118	118	0	0	118
PW8A	429	428	0	0	429
PW8B	258	258	0	0	258
PW8C	39	39	0	0	39
PW10A	63	63	0	63	63
PW10B	101	101	0	101	101
PW11	41	41	0	41	41
PW12	257	257	0	0	257
PW13A	43	43	0	43	43
PW13B	83	83	0	83	83
PW13C	63	63	0	63	63
PW13D	8	8	0	8	8
PW14	649	649	0	0	649
PW15A	187	187	0	0	187
PW15B	87	87	0	0	87
PW16A	39	39	0	39	39
PW16B	115	115	0	115	115
PW16C	302	302	0	302	302
PW16D	80	80	0	0	80
PW16E	162	162	0	162	162
PW17A	118	118	0	0	118
PW17B	399	399	0	0	399
PW18	41	41	0	0	41
PW19A	21	21	0	0	21
PW19B	201	201	0	201	201
PW19C	162	162	0	162	162
PW20A	159	159	0	159	159

Table 88. HCNRA Acres Conveyed and Acquired by Alternative (continued)

Parcel	Acres	Acres within HCNRA			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4
PW20B	224	224	0	0	224
PW20C	151	151	0	151	151
PW21A	81	81	0	81	81
PW21B	76	76	0	76	76
PW21C	75	75	0	75	75
PW21D	151	151	0	151	151
PW22	41	41	0	41	41
PW23A	39	39	0	39	39
PW23B	75	75	0	75	75
PW25A	186	186	0	186	186
PW25B	65	65	0	65	65
PW25C	180	180	0	180	180
PW25D	175	175	0	175	175
PW25E	74	74	0	0	74
PW26A	315	315	0	0	315
PW26B	157	157	0	0	157
PW26C	155	155	0	0	155
PW27A	80	80	0	0	80
PW27C	127	127	0	127	127
PW28	119	119	0	119	119
PW29	143	143	0	143	143
PW48	233	233	0	233	233
Total		8199	0	3529	8199
Parcels Conveyed					
FW1D	325	325	0	0	325
FW1E	127	127	0	0	127
FW5	39	39	0	0	39
FW7	121	121	0	0	121
FW8	83	83	0	0	83
Total		695	0	0	695

Fire and Fuels

The objective of this section is to assess all alternatives from fire suppression and fuels management perspectives. Specific data was not collected for this assessment, although current fuels conditions were interpreted from the FS global information system database stand exams, photos, and vegetation data collected from field reviews of individual parcels. The analysis area includes all of the land within proposed exchange parcels and the lands adjacent to these parcels.

Affected Environment

Fire protection began in the project area in the early 1900's but did not become efficient until the 1940s. Fire was one of the major disturbances that shaped the analysis area prior to suppression activity. With continual occurrence of fire, large forested areas were maintained in early to mid-seral stages. Fuel accumulations from stand development and insect and disease were burned frequently enough to avoid heavy fuel loadings that would cause broad scale stand replacing wildland fires (except in very extreme conditions). This ever-changing mosaic of fire effects was interrupted by the advent of effective fire suppression. Recently, burned stands have acted as natural fuel breaks and tended to check the spread of subsequent fires.

Forest vegetation covers approximately 19,136 acres of private land and 13,239 acres of NFS land proposed for exchange (Upland Forest Vegetation Report). Nearly all the private forested land to be acquired was logged, but the degree of logging ranges from light partial harvests (removal of the larger trees) to regeneration harvest (removal of nearly all trees). Private harvested areas have complied with State BMPs slash disposal requirements or would achieve compliance prior to the Proposed Land Exchange. It is not standard practice to follow harvest on private land with felling or removal of ladder fuels or to underburn. Harvested stands on private land are not necessarily less of a wildfire hazard than unharvested stands. NF parcels to convey generally have not had recent harvesting or fuels treatment. These lands have been protected from wildfire for fifty plus years resulting in many forested Federal parcels having heavier than desirable fuel loadings with intolerant species serving as ladder fuels.

The FS has an ongoing program designed to treat fuels and bring forested land to a desired future condition that resembles the natural conditions prior to efficient wildland fire suppression. This program involves time frames and costs beyond the scope of this analysis.

Most of the NF parcels to convey are either isolated individual parcels or extensions of Federal lands that make up irregular shaped boundaries. The private lands to acquire are individual parcels that are either surrounded by NF lands or immediately adjacent to NF lands. Currently both the NF and the ODF have fire protection and initial attack responsibilities, depending upon the location of initial attack resources. Dispatch of initial attack resources is based on the closest resource regardless of agency. Changes in ownership would affect which agency has responsibility for fire protection, and the corresponding acres protected would change accordingly. Essentially all lands would still be covered with some sort of fire protection it is assumed. It is unknown if any unprotected lands exist in the analysis area. In general, most private lands receive fire protection from a state agency however there are some instances where if a landowner does not pay for protection, those lands are essentially unprotected.

Environmental Consequences

The following is a general discussion related to the merits or disadvantages of each alternative. It is intended to provide an overview that will allow for comparison of alternatives.

Alternative 1: Proposed Exchange

Most timbered parcels that would be acquired under this alternative have undesirable levels of surface fuels, and ladder fuels, and are in need of fuel reduction work. Heavily logged parcels have slash and slash piles contributing further to the problem and expense of treatment. It is not possible to estimate the extent of the fuels treatment work that would be required or the associated costs, but these costs would represent a net increase in cost compared to the No Action Alternative (FS, 2004h).

This alternative would block ownerships by reducing the number of inholdings. This would allow for fuel reduction work on public lands to be applied on larger scales with fewer boundary issues. Alternative 1

would result in a net reduction of 342 miles of National Forest boundary. The result would be less costly fuel treatments.

This alternative would achieve the maximum consolidation of ownership thereby providing for more efficient and cost effective fire protection. Also, Alternative 1 would provide a net gain of 41 miles of road for potential access during fire suppression activities (Table 80, Road Summary by Alternative). Alternative 1 reduces the complexity of the fire management situation. In consolidated areas, one landowner would likely be involved in fire suppression instead of having multi-jurisdictions where NF and ODF protected lands would be involved.

Under this alternative, the NF would gain larger parcels of private land in the Imnaha River area. This area is prone to large wildland fires due to the remoteness of the area, rugged terrain and steep slopes with fine fuels (grass and brush with some scattered timber in draws). The acres requiring FS fire protection would increase, but the FS is usually involved in the fire suppression of this area. The need to protect private property in the Imnaha River Area would be reduced thereby potentially reducing the complexity and jurisdictional concerns.

Alternative 2: No Action

No significant change in fire suppression and fuel conditions would be anticipated during the 10-year analysis period. However, vegetative succession on all stands not harvested or treated for fuels would increase fuel loading since the majority of lands in the project area have biomass accumulating faster than natural decomposition. Increased fuel loading over long periods sets the stage for an increasing likelihood that fires, when they do occur, would be at stand replacing intensity. It is anticipated that some private parcels to acquire if not exchanged would have rural home sites constructed by the private owners. Private homes, outbuildings, and other improvements on adjacent Federal lands would tend to increase the complexity and cost of fuel reduction and fire suppression activities.

Alternative 3: Purchase

This alternative would only purchase approximately 4,249 acres and realize a net reduction of only 37 miles of National Forest boundary. Alternative 3 would provide a net gain of 8 miles of open road for potential access during fire suppression activities (Table 82).

Although this alternative would likely improve fuels management, fire suppression costs, and efficiency in certain areas, it would not provide the benefits achieved by Alternatives 1 or 4. The Purchase Alternative does not achieve the consolidation of land ownership and additional access needed to appreciably influence fire suppression and fuels management activities.

Alternative 4: Deed Restriction

Most timbered parcels that would be acquired under this alternative have undesirable levels of surface fuels, and ladder fuels, and are in need of fuel reduction work. Heavily logged parcels have slash and slash piles contributing further to the problem and expense of treatment. It is not possible to estimate the extent of the fuels treatment work that would be required or the associated costs, but these costs would represent a net increase in cost compared to the No Action Alternative (FS, 2004h).

This alternative would convey all Federal parcels, acquire approximately 17,119 acres and realize a net reduction of 218 miles of National Forest boundary. Alternative 4 would result in a net loss of 8 miles of road for potential access during fire suppression activities (Table 81, Road Summary by Alternative). When compared to Alternative 1, this Deed Restriction Alternative would eliminate approximately 37% less miles of National Forest boundary and would reduce potential access roads for fuels management and fire suppression.

This alternative would likely improve fuels management and fire suppression costs and efficiency more than Alternative 3 but less than Alternative 1.

Hazardous Materials

The objective of this section is to address hazardous materials and solid waste such as trash, debris and unneeded structures. The analysis area boundary is parcels to convey and acquire.

Laws and Regulations Applying to the Analysis

Before properties are acquired in the name of the United States, or before any lands are conveyed by the United States, the FS must exercise due diligence in determining whether any contamination or other environmental liabilities are present on the lands. Compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and FS Manual Direction (FSM 2160, Hazardous Materials Management) is required in any land transaction. CERCLA, as amended, requires that Federal agencies provide information and certain warranties concerning the presence of hazardous materials on conveyed parcels. The same procedures are used for inspection of private lands proposed for acquisition. The FS follows the required "Transaction Screening Process for Land Adjustments"; (LTSP) as outlined in EM-2160-2, dated September 1999. The goal of this process is to identify any actual or possible contamination from hazardous substances, petroleum products, or other contaminants so as to ensure that the FS does not unknowingly acquire or convey contaminated property. Documentation of all inspections is filed in the PR.

Affected Environment

All parcels to be acquired by the NF have been inspected by FS personnel for the presence of hazardous substances. If the initial inspection of the property indicated that hazardous substances were suspected, the Forest CERCLA coordinator conducted a subsequent inspection. If contamination of the property was confirmed, appropriate remedial actions would be taken to remove the contaminant or the property would be dropped from the exchange proposal. Other suspected sites were re-examined and determined to be free of hazardous substances.

FS personnel have inspected all of the parcels proposed for conveyance for the presence of hazardous substances. No Federal parcels contained known or suspected hazardous substances. None of the properties are currently being used as locations for Federal Government Operations or Facilities, nor have any of these properties had such use in the past.

Parcel inspections also recorded solid waste and debris that are considered non-hazardous materials. The FS is currently in a down sizing trend. Acquisition of properties with the financial burden of clean up would not be acceptable.

Federal and non-Federal parcels with observed hazardous materials and non-hazardous solid waste and debris have been identified, listed, and logged with a recommended cleanup action. The recommended actions listed below are considered the minimum necessary for acquisition and conveyance of parcels. The NF and Clearwater agreed to the following recommended actions to assure acquired and conveyed parcels are free of hazardous materials and free of undesirable non-hazardous solid waste and debris.

- *FM3* has a solid waste dumpsite on a spur off of Highway 26. The non-hazardous waste on this Federal parcel consists of garbage, scrap metal, and appliances. The Malheur National Forest would be responsible for cleanup. The waste materials are suitable for landfill and would be disposed of according to local requirements. The estimated cost of $1,000.00 for cleanup would be incurred under all alternatives.

- *PM26* has structures to be retained on site, therefore lead paint and asbestos required reporting would be completed prior to the completion of the Proposed Exchange Alternative.
- *PM30* has structures the FS does not need to retain. FS preference is that structures would be removed prior to acquisition.
- *PU1B* has numerous remnants of old structures, cars, farm equipment, a mill pond, sawdust pile and scrap metal. The site was originally used for as sawmill and also was a homestead. The NF would acquire this parcel "as is" under the Proposed Exchange Alternative and would evaluate the site for its historical significance. The site would be managed as though it were eligible for the National Register of Historic Places until the evaluation is completed.
- *PU13* has an existing pit-toilet outhouse. FS preference is that the structure would be removed prior to exchange.
- *PU16F* has three developed sites with several structures on each site. The FS preference would be that the two pit toilets and other structures would be removed prior to implementation of each action alternative.
- *PU16H* has a recent dumpsite with household hazardous materials. The household materials and associated wastes consist of burned batteries, petroleum containers, household appliances, etc. The dumpsite would be cleaned up prior to acquisition.
- *FW18* has an old gravel pit that has been used as an illegal dumpsite by the public. Dump materials consist of scrap metals, wood and minor garbage. The NF would be responsible for cleanup of the dumpsite on this Federal parcel. The estimated cost of $1,000.00 for cleanup would be incurred under the all alternatives.
- *PW48* is known as the Litch Ranch and has several structures. The NF would like to acquire this site with all structures "as is". The site has a burn barrel with household hazardous wastes such as batteries. Under the Proposed Exchange, Purchase or Deed Restriction alternatives the lead paint and asbestos required reporting would be completed prior to implementation of any of these alternatives. All hazardous materials would be removed from the property prior to acquisition.
- *PW24A* has two dumpsites with metal, plastic, wire, wood and household garbage. A burn pile contains baling twine and garbage. The dumpsite would be cleaned up prior to the implementation of the Proposed Exchange or Deed Restriction Alternative.
- *PW24H* is an old homestead with several structures that are in disrepair and ruins. The adjacent large corral complex and constructed livestock feeding area was being used. There are minor amounts of waste in the cellar of the barn. The FS does not want to acquire the structures at this site. The livestock feeding area has been discontinued and the site would be cleaned prior to implementation of an exchange alternative.
- *PW25B* has metal debris, old vehicles, an excavated dumpsite currently in use, and several old dumpsites. It also has three hazardous material petroleum spill areas, the largest of which is adjacent to the river. The FS would acquire this parcel under the Proposed Exchange, Purchase or Deed Restriction alternatives except that a portion of the parcel would not be acquired (see Land Use section). All hazardous materials would be cleaned up on the lands to be acquired.
- *PW25E and PW27C* is currently a working ranch with home and several outbuildings. There is an existing above ground fuel tank and evidence of petroleum spills and possible groundwater contamination. A 10-acre parcel occupying the site would be delineated and removed from exchange consideration. The FS would not acquire the hazardous materials sites under the Proposed Exchange, Purchase or Deed Restriction alternatives. All

contaminated lands within these parcels would be subdivided from the larger parcels and not acquired by the FS. All debris would be removed from the lands to be acquired.

- *PW33* has structures and at portions of the parcel there are remnants of an old cabin, wood and metal debris. The FS preference is that structures would be removed under the Proposed Exchange Alternative. PW33 is likely to be dropped from the exchange.
- *PW34B* has an active ranch with home, outbuildings, farm machinery, irrigation equipment and abandoned metal and equipment. The structures are in fair to good condition. The homestead, railroad car-bridge, and outbuildings (10 acres) would be subdivided from this parcel and not be included in the Proposed Exchange or Deed Restriction alternatives. Private road access would be reserved for this homestead. An easement across NF lands would also be granted to provide continued access to the homestead.
- *PW39B* has an old homestead with several structures and associated developments. This parcel may have potential hazardous materials associated with batteries, household chemicals, plastic tanks propane bottles, propane tanks etc. There is a large dumpsite with old farm equipment, household appliances, garbage and household trash on the site. All hazardous materials would be removed on the parcel prior to acquisition. The FS does not need to retain the structures at this site. FS preference is that structures would be removed prior to acquisition and that the domestic water system would be decommissioned under the Proposed Exchange Alternative
- *PW40* has a very old dumpsite with rusted metal debris and log structures that are falling down. Wastes are not hazardous and are small enough in quantity to warrant no action under the Proposed Exchange Alternative.

Environmental Consequences

The burden for clean up of hazardous materials and non-hazardous waste on private parcels would rest on the current landowners or Clearwater, the exchange facilitator. The FS would cleanup Federal parcels FM3 and FW18 under the Proposed Exchange and Deed Restriction alternatives. A lead paint and asbestos report would be required for any structures that would be acquired or purchased. The implications to the environment are minor for parcels that are contaminated with solid wastes and/or hazardous wastes. In most cases, the solid wastes could be disposed at local landfills. All parcels acquired would have hazardous materials cleaned up in accordance with CERCLA and FS Manual Direction.

A verification of inspection prior to the implementation of an action alternative to the satisfaction of all parties would be required for any parcel with solid waste and trash recommended for removal.

Land Use

The objective of this section is to disclose specific parcel information on consequences and curative actions by alternative that would be related to “land uses”. Specific categories addressed include: 1) Public access considerations; 2) Encumbrances; 3) Encroachments; and 4) Site conditions. Identified curative actions that would occur are intended to protect land use rights, comply with exiting laws, regulations, and policies and show benefits/liabilities to the FS and Clearwater by alternative. Appurtenant water rights and special characteristics are also identified in the table.

The analysis area boundary is parcels with land use considerations to acquire and convey.

Affected Environment

The Federal parcels in the Proposed Land Exchange and the specific land use considerations associated with these parcels are described in Table 89. The non-Federal parcels in the Proposed Land Exchange and the specific land use considerations associated with these parcels are described in Table 90. Also, these tables identify the land use considerations that apply to exchange parcels for alternatives 3 and 4.

Table 89. Federal Parcel Land Use Considerations by Alternative

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
FM2/Map 22			✓		✓
Appurtenant Water Rights [1]	Irrigation right on 14.4 acres from Thompson Gulch.	Water rights would transfer with title to property.			
Public Access Considerations	There is no public or administrative access to this parcel.	Conveyance of the parcel would eliminate need and cost to acquire an easement.			
FM3/Map21			✓		✓
Public Access Consideration	US Highway 26 crosses this parcel.	Conveyance document would be issued subject to this previously granted easement to the State DOT.			
Authorized Uses	Special Use Permits have been issued for overhead power lines to Oregon Trail Electric Consumers Cooperative, Inc. and Idaho Power Company.	Rights of OTEC and IPC would be protected as part of conveyance of property.			
	Special Use has been issued for buried telephone and fiber optic cable to Oregon Telephone Company.	Rights of Oregon Telephone Company would be protected as part of conveyance of property.			
	Dump site on spur off Highway 26.	Site would be cleaned up and restored prior to conveyance.			
Encumbrance	Reservation to Oregon Lumber Co. for existing roads, telephone lines and logging roads of the Oregon Lumber Co.	Conveyance of property would be subject to rights, if any, of Oregon Lumber Co. and the successors in interest, if any.			
FM4, 5, 6, 7 & 8/Map 23			✓		✓
Encumbrance	Reservation to Oregon Lumber Co. for existing roads, telephone lines and logging roads of the Oregon Lumber Co.	Conveyance of property would be subject to rights, if any, of Oregon Lumber Co. and the successors in interest, if any.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
FM9/Map23			✓		✓
Appurtenant Water Rights [1]	Stock reservoir located on this parcel.	Water rights would transfer with title to property.			
Public Access Considerations	Grant County Road 18 crosses this parcel.	Conveyance document would reserve County road rights/retain public use.			
	Forest Roads 1800899 and 1800454 cross this parcel and are needed for access to other NFS lands.	Conveyance document would reserve easement to the US on these two roads.			
Encumbrance	Power transmission lines, irrigation ditches, water pipe lines and telephone lines may cross this parcel.	Conveyance document would convey these lands subject to these rights, if any.			
	Outstanding interest in oil, gas and other minerals, with the right to prospect for, mine and remove.	Conveyance document would convey these lands subject to these rights.			
FM10/Map 23			✓		✓
Appurtenant Water Rights [1]	One livestock reservoir is located on this parcel.	Water rights would transfer with title to property.			
Encumbrance	Reservation to Oregon Lumber Co. for existing roads, telephone lines and logging roads of the Oregon Lumber Co.	Conveyance of property would be subject to rights, if any, of Oregon Lumber Co. and the successors in interest, if any.			
FM11/Map 24			✓		✓
Public Access Considerations	Oregon State Highway No. 395 crosses parcel.	Conveyance document would reserve rights of State on the highway.			
Encumbrances	Special Use Permit to Oregon Trail Electric Consumers Cooperative, Inc. for powerline.	Rights of OTEC would be protected as part of conveyance of property.			
	Permit issued to Oregon State Highway Commission for Pendleton-John Day Highway #395.	Conveyance document would reserve rights of State on the highway. Special Use Permit would be eliminated.			
	Reservation to Oregon Lumber Company for existing roads, telephone lines and logging roads.	Conveyance of property would be subject to rights, if any, of Oregon Lumber Co. and the successors in interest, if any.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
Encroachment	Driveway and power line to adjacent private residence may cross this parcel. This use has not been authorized.	Rights of access would be protected as part of conveyance of property; if it is determined that driveway is located on Federal land.			
FM12/Map 24			✓		✓
Public Access Considerations	Forest Road #3900051 and #3900112 cross this parcel and provide access to adjacent NFS lands.	Conveyance document would reserve easements to the US on these roads.			
Encumbrance	Special Use has been issued for power line to Oregon Trail Electric Consumers Cooperative, Inc.	Rights of OTEC would be protected as part of conveyance of property.			
	Permit issued to Oregon State Highway Commission for Pendleton-John Day Highway No. 395.	Rights of the State would be protected as part of conveyance of property.			
	Reservation to Oregon Lumber Company for existing roads, telephone lines and logging roads.	Conveyance of property would be subject to rights, if any, of Oregon Lumber Co. and the successors in interest, if any.			
	Easement issued to Oregon Department of Transportation (ODOT) on spur road off ORS 395 across this parcel.	Property would be conveyed subject to existing rights of ODOT.			
	Irrigation diversion from Beech Creek to adjacent private land to the east crosses this parcel. Use does not appear to be authorized.	Conveyance of property would resolve this potential encroachment. Use would be protected as part of conveyance of property.			
FM15& 16A/Map 17			✓		✓
Appurtenant Water Rights[1]	Eight livestock reservoirs are located on these parcels.	Water rights would transfer with title to property. Apply for water rights, if needed.			
FM17/Map 17			✓		✓
Appurtenant Water Rights[1]	Four livestock reservoirs are located on this parcel	Water rights would transfer with title to property. Apply for water right, if needed.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
Public Access Considerations	Forest Roads #4020201, #4020204, #4020205 & #4020206 cross this parcel and provide access to adjacent NFS lands.	Conveyance document would reserve easements to the US on these four roads across the parcel.			
FM18&19/Map 17			✓		✓
Appurtenant Water Rights[1]	Six livestock reservoirs and one water trough are located on this parcel.	Water rights would transfer with title to property. Apply for water right, if needed.			
FM21/Map17			✓		✓
Public Access Considerations	Forest Roads 4040150 and 4020204 cross this parcel and provide access to adjacent NFS lands.	Conveyance document would reserve easements to the US on these four roads across the parcel.			
Appurtenant Water Rights[1]	Two livestock reservoirs are located on this parcel.	Water rights would transfer with title to property. Apply for water right, if needed.			
FU1/Map 10			✓		✓
Encroachment	Recreational residential development encroaches on this parcel.	Conveyance of parcel would resolve encroachment.			
FU2, 3A, 3B, 3C, 3D, 3E and FU4/Map 10			✓		✓
Public Access Considerations	There is no public or administrative access to these parcels.	Conveyance of these parcels would eliminate need and cost to acquire easements.			
Appurtenant Water Rights[1]	Water right to Oregon-Washington Railroad Company.	Rights of Railroad Co. would be protected as part of exchange process.			
	Four livestock and wildlife reservoirs are located on parcels FU3A, FU3C, and FU3D.	Water rights would transfer with title to property. Correct errors on water rights certificate.			
Encumbrances	Union Pacific Railroad ROW crosses FU2, FU3A, FU3B, and FU3C. Special Use permit issued to Railroad across FU2.	Rights of Union Pacific would be protected as part of exchange.			
FU7/Map12			✓		✓
Public Access Considerations	There is no public or administrative access to this parcel.	Conveyance of the parcel would eliminate need and cost to acquire an easement.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
FU8, 9, 10A&B, 11, 12, 13 & 14/Map13			✓		✓
Public Access Considerations	There is no public or administrative access to these parcels.	Conveyance of parcels would eliminate need and cost to acquire multiple easements.			
FU15, 16 & 17/Map 19			✓		✓
Public Access Considerations	There currently is no public or administrative access to these parcels.	Conveyance of the parcel would eliminate need and cost to acquire an easement.			
FU18/Map19			✓		✓
Public Access Considerations	Forest Road #3969 crosses this parcel and provides access to adjacent NFS lands.	Conveyance document would reserve easement to the US on this road across this parcel.			
FU20B, C & D/Map 13			✓		✓
Public Access Considerations	Morrow County Road No. 406 (Log Spring Road) crosses these parcels.	Conveyance document would reserve County rights on this road, retaining public use.			
FU21/Map 13			✓		✓
Appurtenant Water Rights[1]	Two livestock and wildlife reservoirs are located on this parcel.	Water rights would transfer with title to property.			
FU22/Map 13			✓		✓
Public Access Considerations	There is no public or administrative access to this parcel.	Conveyance of the parcel would eliminate need and cost to acquire an easement.			
FU23/Map13			✓		✓
Public Access Considerations	Morrow County Road No. 406 crosses this parcel.	Conveyance document would reserve rights on this road, retaining public use.			
	Forest Roads 4060150 and 4060152 cross this parcel.	Conveyance document would reserve easement to Hutchinson Mountain Ranch for cattle crossing.			
FU25/Map14			✓		✓
Public Access Considerations	Morrow County Roads Nos. 678, 618 and 26 cross this parcel.	Conveyance document would reserve County rights on these roads, retaining public use.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
Site Conditions	Special Use has been issued for overhead telephone lines to Century Telephone.	Conveyance of the parcel would eliminate need for special use permit. Conveyance document would protect rights of Century Telephone.			
	Special Use has been issued for power lines to Columbia Basin Electric Cooperative.	Conveyance of the parcel would eliminate need for special use permit. Conveyance document would protect rights of Columbia Basin Electric Coop.			
Encroachment	Private driveway may encroach on this parcel.	Rights of access would be protected as part of conveyance of property, if it is determined that use is on Federal property.			
FU26/Map 14			✓		✓
Site Conditions	Forest Road No. 5350270 crosses this parcel and provides access to adjacent NFS lands.	Conveyance document would reserve easement to the US on this road across the parcel.			
FU27 & 28/Map 15			✓		✓
Public Access Considerations	There currently is no public or administrative access to these parcels	Conveyance of the parcels would eliminate need and cost to acquire easement.			
FU30/Map13			✓		✓
Appurtenant Water Rights[1]	Spring development for stock use is located on this parcel.	Water use is exempt use. All interest in this development would transfer with title to the land.			
Public Access Considerations	There is no public or administrative access to this parcel.	Conveyance of the parcel would eliminate need and cost to acquire easement.			
FW1D&1E/Map 8			✓		✓
Appurtenant Water Right[1]	One livestock reservoir is located on this parcel.	Water rights would transfer with title to property. Apply for water right, if needed.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
Land Uses	Both parcels are located within the boundary of HCNRA, and withdrawn from location under mining laws or mineral leasing disposition.	Revocation of withdrawal would occur prior to conveyance.			
FW2 & 5/Map 6			✓		✓
Public Access Considerations	There is no public or administrative access to these parcels.	No existing roads access these two parcels. Conveyance of the parcels could eliminate potential need and cost to acquire easement.			
Land Uses	FW5 is located within the boundary of HCNRA, and withdrawn from location under mining laws or mineral leasing.	Revocation of withdrawal would occur prior to conveyance.			
FW6A,B,C,D,E&F/Map 6			✓		✓
Appurtenant Water Rights[1]	Water right indicates one acre of irrigation is located on FW6A.	Field review indicates no water uses on this parcel. US would notify OWRD to correct maps.			
Public Access Considerations	These parcels abut other NFS lands, allowing for legal access, but there currently is no roaded public or administrative access to them. Private road on FW6C & 6E has not been authorized	Conveyance of the parcels would eliminate potential need to acquire easement and eliminate need to authorize road use.			
FW7&8/Map 5			✓		✓
Land Uses	Both parcels are located within the boundary of HCNRA, and withdrawn from location under mining laws or mineral leasing.	Revocation of withdrawal would occur on these two parcels prior to conveyance.			
	FW8 is located within the Imnaha River Wild and Scenic River boundary and withdrawn from entry under public land laws.	Revocation of withdrawal would occur on this parcel prior to conveyance.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
FW10/Map 5			✓		✓
Public Access Considerations	Forest Roads 3940, 3940200 and 3940210 cross this parcel and provide access to adjacent NFS lands.	Conveyance document would reserve easement to the US on these roads across this parcel.			
FW11/Map 5			✓		✓
Public Access Considerations	Forest Road No. 3940 crosses this parcel and provides access to adjacent NFS lands.	Conveyance document would reserve easement to US on this road across the parcel.			
FW12/Map 3			✓		✓
Public Access Considerations	There is no public or administrative access on roads to these parcels. Legal access exists from adjacent NF lands.	Conveyance of these parcels would eliminate need and cost to acquire easement.			
Encroachment	Water being diverted from stream on FW12 to adjacent private property. This use has not been authorized.	Conveyance of land would eliminate potential need to issue special use permit or other administrative remedy. Use would be protected as part of conveyance of property.			
Appurtenant Water Rights[1]	Water conveyance system (with valid water right) crosses this parcel. This use has not been authorized.	Use would be protected as part of conveyance of property.			
FW14B/Map 2			✓		✓
Public Access Considerations	Forest Road #8250147 crosses this parcel and provides access to adjacent NFS lands.	Conveyance document would reserve an easement to the US on this road.			
FW15&16/Map 2			✓		✓
Public Access Considerations	There is no public or administrative access to these two parcels.	Conveyance of the parcels would eliminate need and costs to acquire easement.			
FW17A & 17C/Map 3			✓		✓
Encumbrance	Special Use has been issued for water transmission line across this parcel.	Conveyance of the parcel would eliminate need for a special use permit.			

Table 89. Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	2	3
Land Uses	Both parcels are located within the boundary of the Lostine River Roadside and Riverfront Zone and the Lostine W&S River and are withdrawn from all forms of appropriation.	Revocation of withdrawal on these two parcels would occur prior to conveyance.			
FW18/Map 11			✓		✓
Public Access Considerations	State Highway 244 crosses this parcel.	Conveyance document would reserve State Highway rights on this road, retaining public access.			
Site Conditions	Old gravel pit used as dump site.	Site would be cleaned up and restored prior to conveyance.			
Encumbrances	Buried powerline crosses parcel, providing power to Starkey Experimental Forest.	This use would be protected in conveyance document.			
FW20, 21 & 24/Map 1			✓		✓
Public Access Considerations	The US currently does not have right-of-way on roads accessing these parcels for either administrative or public use. Legal access exists from adjacent NF lands.	Conveyance of the parcel would eliminate need and costs to acquire easement.			
FW22/Map 1			✓		✓
Public Access Considerations	There is no public or administrative access to this parcel.	Conveyance of the parcel would eliminate need and costs to acquire easement.			
FW23/Map 1			✓		✓
Public Access Considerations	Wallowa County Road No. 500 (Forest Road No. 8220) may cross this parcel.	Conveyance document would reserve County and US rights on this road, retaining rights for public use.			
FW25A&B/Map 1			✓		✓
Public Access Considerations	Wallowa County Road No. 500 (Forest Road No. 8220) crosses these parcels.	Conveyance document would reserve County and FS rights on this road, retaining public use.			

1) History of use, and therefore current status of some water rights may be dubious.

Table 90. Non-Federal Parcel Land Use Considerations by Alternative

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PU1A & PU1B/Map 1			✓	✓ 1A	✓ 1A
Appurtenant Water Rights[1]	Five livestock/wildlife reservoirs and one (exempt) spring development located on PU1B. One reservoir has no water right.	Water Right would transfer with title to the property. Correct errors on certificate maps. File for water right for one reservoir. Spring development is exempt.			
Public Access Considerations	US currently does not hold either administrative or public access rights across either parcel on Road No. 6208.	Acquisition of parcel would eliminate need to acquire easement.			
Site Conditions	PU1B is site of old sawmill and homestead. Remnants of these still remain on the parcel. No hazardous materials are located on the parcel.	Acquisition of the parcel would allow for evaluation for possible inclusion in National Register of Historic Places.			
Special Characteristics	A portion of PU1A is located within the boundary of the Wenaha-Tucannon Wilderness Area. A portion of PU1A is located within the boundaries of the Wenaha Wild and Scenic River.	That portion lying within the wilderness would become wilderness and be withdrawn from all forms of appropriation under the mining laws and from disposition under mineral leasing laws. That portion within the W&S River boundary would be withdrawn from entry, sale or other disposition under public land laws.			
PU5/Map 10			✓		
Appurtenant Water Right[1]	Livestock/Wildlife reservoir located on parcel.	Water Right would transfer with title to the property.			
Site Conditions	Parcel has been recently logged.	Slash disposal, reforestation, and soil stabilization would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PU7B/Map 10			✓		
Appurtenant Water Rights[1]	Livestock/Wildlife reservoir located on parcel.	Water Right would transfer with title to the property.			
Public Access Considerations	US currently does not hold easement on Road 3030050.	Acquisition of parcel would eliminate need to acquire easement.			
PU7C/Map 10			✓		
Appurtenant Water Rights[1]	Livestock/Wildlife reservoir located on parcel.	Water Right transfers with title to the property.			
Public Access Considerations	US currently does not hold easement on Roads 3030090 and 3030095.	Acquisition of parcel would eliminate need to acquire easements.			
PU11B/Map 10			✓		
Appurtenant Water Rights[1]	Two livestock/wildlife reservoirs located on parcel.	Water Right would transfer with title to the property. Correct errors on application map.			
PU12/Map 10			✓		
Encumbrance	Easement to Oregon-Washington Railroad & Navigation Co. for roadway across PU12.	Property would be acquired subject to the terms and conditions of said easement, all of which are acceptable to the US.			
PU13/Map20			✓		✓
Site Conditions	Pit Toilet is located on parcel.	Structure would be removed.			
PU14/Map12			✓		
Public Access Considerations	US does not hold easement on Road No. 5900230 across this parcel. Oregon State Highway crosses parcel.	Acquisition of parcel would eliminate need and cost to acquire easement on Road. 5900230. State Highway right-of-way held in fee by State.			
PU15/Map12			✓		✓
Appurtenant Water Rights[1]	Two stock ponds are located on this parcel.	Water right would transfer with title to property. Apply for stock water right.			
Public Access Considerations	US does not hold easement on Road. #5400170 across this parcel.	Acquisition of parcel would eliminate need to acquire easement.			
PU16B & 16C/MAP 19			✓		✓
Appurtenant Water Rights[1]	Livestock/Wildlife reservoir is located on PU16C	Water rights would transfer with title to property. Correct errors in certificate and application map.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
	Waterline for mining water right crosses both of these parcels.	Property would be acquired subject to this use.			
PU16E, F, G & H/MAP 19			✓	✓ 16F	✓
Site Conditions	Parcel contains cabin, sheds, corrals, and places being used for RV use. A dumpsite is located on PU16H.	FS preference is improvements would be removed prior to acquisition of parcel. Dumpsite would be cleaned up prior to acquisition.			
Encumbrances	State of Oregon Game Commission owns an easement for the benefit of the general public for angling and other recreational purposes that encumbers both PU16F and PU16G.	Property would be acquired subject to the terms and conditions of said easement, all of which are acceptable to the US.			
Appurtenant Water Rights[1]	Four livestock reservoirs are located on Parcel 16E and 16H.	Water rights would transfer with title to property.			
Special Characteristics	Portions of PU16E, F, and G are located within the boundaries of the North Fork John Day Wild and Scenic River.	Those portions of the parcels within the W&S River boundary would be withdrawn from entry, sale and other disposition under public lands laws following acquisition.			
PU19/Map 12			✓		
Public Access Considerations	US does not hold written easement on Road No. 5425335 across this parcel.	Acquisition of parcel would eliminate need and cost to acquire easement.			
PU20/Map 18			✓		✓
Appurtenant Water Rights[1]	Stock reservoir is located on this parcel.	Water rights would transfer with title to property. Apply for stock water right.			
PU21/Map 21			✓		✓
Site Conditions	Large slash piles remain on parcel from past logging.	Slash disposal, reforestation, and soil stabilization would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PU22A&B/MAP 15			✓		✓ 22B
Appurtenant Water Rights[1]	Four livestock/wildlife reservoirs are located on parcel 22A.	Water rights would transfer with title to property. Correct errors on certificate.			
Site Conditions	Roads and meadow rutted due to recent logging on both PU22A and PU22B.	Slash disposal, reforestation, and soil stabilization would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			
PU23/Map 15			✓		
Public Access Considerations	US does not hold written easement on Road No. 23 across a portion of this parcel.	Acquisition of parcel would eliminate need and cost to acquire easement.			
Encumbrances	Easement to Telephone Utilities of Eastern Oregon, Inc. for buried telephone lines in existing roads.	Property would be acquired subject to the terms and conditions of said easement.			
PU24/Map 15			✓		
Site Conditions	Shed and spring development is located on parcel.	Spring development would be removed prior to acquisition of the parcel. Shed is deteriorating naturally.			
Encumbrances	Coal and other mineral rights are outstanding to a third party.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
PM1/Map 21			✓		
Public Access Considerations	US does not hold easement on Road No. 1940276 across this parcel.	Acquisition of parcel would eliminate need and cost to acquire easement.			
PM2/Map 21			✓		✓
Appurtenant Water Rights[1]	Irrigation Water right for a total of 3.5 acre-feet per year.	Water right would transfer with title to property.			
Public Access Considerations	US Highway 26 crosses PM2.	State Highway right-of-way held in fee by State.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Encumbrances	1) Powerline easement to California-Pacific Utilities Co., 2) Easement for existing water diversion ditch to adjacent private landowner, 3) Riparian Lease to Oregon Dept of Fish & Wildlife, and 4) Utility easement to Oregon Telephone Co.	Property would be acquired subject to the terms and conditions of said easements, all of which are acceptable to the US.			
PM4/Map21			✓		
Appurtenant Water Right[1]	Mining water right for 1 cfs from tributary of Middle Fork John Day River.	Water right would transfer with title to property.			
Encumbrances	Mineral rights are outstanding to a third party.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
PM5/Map 18			✓		
Appurtenant Water Right[1]	Mining Water Right for 5 cfs from tributaries of Middle Fork John Day River.	Water right would transfer with title to property.			
PM6/Map 23			✓		
Site Condition	Slash from recent logging.	Slash disposal, reforestation, and soil stabilization would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			
PM7/Map 24			✓		
Appurtenant Water Right[1]	Three livestock/wildlife reservoirs located on the parcel.	Water Right would transfer with title to the property.			
PM8A&B/Map 24			✓		
Site Condition	Slash from recent logging. Some slash affecting road drainage.	Slash disposal, reforestation, and soil stabilization conditions would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PM12 & PM13/Map 24			✓		
Site Condition	Rutting and erosion on roads.	Slash disposal, reforestation, and soil stabilization would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			
PM14 & PM15/Map 24			✓		
Encumbrances	Mineral rights are outstanding to a third party.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
PM17 & PM 18/Map 24			✓		
Site Condition	Portions of both parcels burned by July 2003 wildfire. Roads/dozer trails rutted.	Slash disposal, reforestation, and soil stabilization conditions would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			
Encumbrances	Mineral rights are outstanding to a third party.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
PM19 & PM20/Map 24			✓		
Encumbrances	Mineral rights are outstanding to a third party.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
Site Condition	Rutting and erosion on roads on PM19.	Slash disposal, reforestation, and soil stabilization would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PM21 & PM 25/MAP 26			✓		
Encumbrances	One-half interest in all minerals is outstanding to a third party.	Parcel would be acquired subject to this outstanding right. Other ½ interest in minerals would be acquired by donation from the exchange facilitator and would not be available for entry under US Mining Laws, but would be subject to mineral leasing laws.			
PM26/Map 26			✓		
Site Condition	Cabin, outhouse, hay shed and corrals are located on this parcel.	Property would be acquired as is. Acquisition would allow for further evaluation and possible inclusion in National Register of Historic Places.			
Encumbrances	One-half interest in all minerals is outstanding to a third party.	Parcel would be acquired subject to this outstanding right. Other ½ interest in minerals would be acquired by donation from the exchange facilitator and would not be available for entry under US Mining Laws, but would be subject to mineral leasing laws.			
PM27, 28, 29, 30 & 31 /Map 26			✓		
Appurtenant Water Right[1]	One livestock/wildlife reservoir located on PM30.	Water Right would transfer with title to the property.			
Site Condition	Line cabin, outhouse, corrals, spring development, water trough are located on PM30.	FS preference is that structures would be removed prior to acquisition.			
Encumbrances	One-half interest in all minerals is outstanding to a third party.	Parcel would be acquired subject to this outstanding right. Other ½ interest in minerals would be acquired by donation from the exchange facilitator and would not be available for entry under US Mining Laws, but would be subject to mineral leasing laws.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PW1,2A&2B/ MAP 8			✓	✓	✓
Public Access Considerations	US does not hold written easement on Trail #1714 across PW1, PW2A, or PW2B.	Acquisition of parcel would eliminate need to acquire easement.			
Special Characteristics	All three parcels are located within the boundary of the HCNRA. All of PW1 and PW2A and portions of PW2B lie within the Wild and Scenic River boundary.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition. Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws following acquisition.			
Site Conditions	Old mine adit located on PW2B.	Portal would require bat-friendly gate for public safety.			
PW3, PW4, PW5 & PW48/Map 8			✓	✓ 48	✓
Appurtenant Water Right[1]	Irrigation right for 15.2 acres from Cow Creek on PW3 and PW48. Also domestic use on PW48, no water right.	Water right would transfer with title to property.			
Site Conditions	House, shed, barn, and corrals are located on property.	Property would be acquired as is. Acquisition would allow for evaluation for possible inclusion in National Register of Historic Places.			
Special Characteristics	All four parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
Encumbrances	One-half interest in all minerals is outstanding to a third party.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
Access Considerations	Legal, but no roaded, access to these parcels.	Would secure legal roaded access to these parcels as part of acquisition.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PW6/Map 8			✓		✓
Public Access Considerations	US does not hold written easement on Trail No. 1714 across this parcel.	Acquisition of parcel would eliminate need to acquire easement.			
Special Characteristics	All three parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
Site Conditions	Old mine adit is located on this parcel.	Portal would require bat-friendly gate for public safety.			
PW7A,B&C and PW8A,B&C MAP 8			✓		✓
Appurtenant Water Rights[1]	Irrigation right for 20.3 acres from on PW7C, PW8B and PW8C. Stock water right of 0.1 cfs/1000 head from SF Tully Creek.	Water rights would transfer with title to property.			
Encumbrance	Powerline easement crosses Parcels PW8A, 8B, and 8C.	Property would be acquired subject to these rights.			
Encumbrance	Easement for stock driveway to adjacent landowner over PW7C and PW8C.	Property would be acquired subject to the terms and conditions of easement, all of which are acceptable to the US.			
Special Characteristics	All six parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
Access Considerations	Legal, but no roaded, access to PW7C, 8A, 8B, and 8C.	Would secure legal roaded access to these parcels as part of acquisition.			
PW10A&B/Map 8			✓	✓	✓
Appurtenant Water Right[1]	Right to irrigate 7.2 acres from Imnaha River on parcel PW10B.	Water right would transfer with title to property.			
Encumbrance	Easement for stock driveway to adjacent landowner over both parcels.	Property would be acquired subject to the terms and conditions of easement, all of which are acceptable to the US.			
	Rights of Wallowa County on the Dug Bar road across these two parcels.	Property would be acquired subject to these rights.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
	Easement for stock driveway to adjacent landowner over PW10B.	Property would be acquired subject to the terms and conditions of easement, all of which are acceptable to the US.			
Site Condition	Livestock feeding area located on PW10A.	Livestock feeding area discontinued and site is being restored.			
Special Characteristics	Portions of these two parcels lie within the Wild and Scenic River boundary. Both parcels are located within the boundary of the HCNRA.	Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws. Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW11&12/Map 8			✓	✓ 11	✓
Appurtenant Water Rights[1]	Irrigation right for 19.0 acres from Thorn Cr. and NF Thorn Creek on PW12. Stockwater reservoir on PW11.	Water rights would transfer with title to property. Apply for stock water rights.			
Encumbrance	Powerline easement crosses PW12.	Property would be acquired subject to these rights.			
Special Characteristics	Both parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
Access Considerations	Legal, but no roaded, access to PW12.	Would secure legal roaded access to these parcels as part of acquisition.			
PW13A,B,C&D/Map 8			✓	✓	✓
Appurtenant Water Right[1]	Right to irrigate 3.0 acres from the Imnaha River on PW13D.	Water right would transfer with title to property.			
Encumbrance	Rights of Wallowa County on the Dug Bar road across these parcels.	Property would be acquired subject to these rights.			
Site Condition	Livestock feeding area located on PW13D.	Livestock feeding area discontinued and site is being restored.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Special Characteristics	Portions of these four parcels lie within the Wild and Scenic River boundary. All parcels are located within the boundary of the HCNRA.	Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws. Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW14&PW15A&B/Map 8			✓		✓
Appurtenant Water Rights[1]	Irrigation right for 32 acres from Corral Creek and Dodson Creek on PW15A&B. Irrigation ditch is also located on these two parcels. Spring development on PW14.	Water right would transfer with title to property. Spring development is exempt use.			
Special Characteristics	Parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW16A,B,C,D&E/Map 8			✓	✓ 16 A, C & E	✓
Appurtenant Water Rights[1]	Stock reservoir and spring development for stock water are located on PW16C and 16D.	Water right would transfer with title to property. Apply for water right on reservoir. Spring development use is exempt.			
Encumbrance	Powerline easement crosses PW16C and 16D.	Property would be acquired subject to these rights.			
Encumbrance	Rights of Wallowa County on the Dug Bar road across these parcels.	Property would be acquired subject to these rights.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Special Characteristics	Portions of these five parcels lie within the Wild and Scenic River boundary. All five parcels are located within the boundary of the HCNRA.	Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws. Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW17A&B & PW18/Map 3			✓		✓
Special Characteristics	All three parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW19A, B & C/ MAP 8			✓	✓ 19 B & C	✓
Appurtenant Water Rights[1]	Irrigation right for 14.4 acres from Horse Creek.	Water right would transfer with title to property.			
Encumbrance	Road Easement to adjacent landowner crosses PW19B&C.	Property would be acquired subject to the terms and conditions of said easements, all of which are acceptable to the US.			
Special Characteristics	All three parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
Access Considerations	Legal, but no roaded, access to these parcels.	Would secure legal roaded access to these parcels as part of acquisition.			
PW20A,B & C MAP 8			✓	✓ 20 A & C	✓
Appurtenant Water Rights[1]	Irrigation Right on 50 acres from tributaries of Imnaha River on PW20B&C.	Water right would transfer with title to property.			
Encumbrance	Powerline easement crosses PW20A, 20B and 20C. Rights of Wallowa County on the Dug Bar Road across these parcels.	Property would be acquired subject to these rights. Property would be acquired subject to these rights.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Special Characteristics	Portions of these three parcels lie within the Wild and Scenic River boundary. All three parcels are located within the boundary of the HCNRA.	Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws. Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
Site Conditions	Livestock feeding area located on PW20C.	Livestock feeding operation discontinued and site is being restored.			
PW21A,B,C&D/Map 8			✓	✓	✓
Appurtenant Water Rights[1]	Irrigation Right for 3.8 acres from tributary of Imnaha River on PW21C.	Water right would transfer with title to property.			
Special Characteristics	A portion of PW21C lies within the Wild and Scenic River boundary. All four parcels are located within the boundary of the HCNRA.	Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws. Lands would be withdrawn from location entry and patent under Mining laws following acquisition.			
Encumbrance	Rights of Wallowa County on the Dug Bar road across PW21C.	Property would be acquired subject to these rights.			
PW22/Map 8			✓	✓	✓
Special Characteristics	Parcel is located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW23A&B/ Map 8					
Appurtenant Water Right[1]	Point of Diversion and ditch for water use to adjacent property are located on PW23B.	Lands would be acquired subject to this use, if still needed.	✓	✓	✓

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Special Characteristics	A portion of PW23B lies within the Wild and Scenic River boundary. Both parcels are located within the boundary of the HCNRA.	Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws. Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
Encumbrance	Rights of Wallowa County on the Dug Bar road across PW23B.	Property would be acquired subject to these rights.			
	Powerline easement crosses PW23B.	Property would be acquired subject to these rights.			
PW24A,B,C,D,E,F,G,H/Map 6			✓		✓ 24A, B,C, D,G & H
Appurtenant Water Rights[1]	PW24E, F, and H: Irrigation right for 0.098 cfs from Camp Creek. Irrigates 23 acres. Stock reservoirs on PW24E and PW24F	Water rights would transfer with title to property. Confirm exempt stock water reservoir use.			
	Two water conveyance ditches are located on PW24A.	Easement would be granted prior to conveyance of property. Lands would be acquired subject to these uses.			
Public Access Considerations	State Highway 350 crosses all parcels. Wallowa County Road No. 676 crosses PW24H.	State Highway right-of-way held in fee by State. Acquisition of parcel would be subject to county right-of-way.			
Site Conditions	House, barn and corrals located on PW24H. Two small dumpsites located on PW24A. Constructed livestock feeding areas located on PW24A, 24D and 24H.	FS preference is that structures would be removed prior to acquisition. Dumpsites would be cleaned up. Livestock feeding operation discontinued and site to be cleaned up.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Encumbrance	Utility line easement across PW24E, F, G, and H.	Parcel would be acquired subject to the terms and conditions of this easement, all of which are acceptable to the US.			
PW25A, B, C, D, E, PW27A & C MAP 6			✓	✓ 25A, B, C, D & 27C	✓
Appurtenant Water Rights[1]	Two water rights for irrigation of a total of 32.8 acres on PW25B, PW25D, PW25E and PW27C. Also stock water use. Livestock reservoir located on PW25E and PW27C.	Irrigation water rights would transfer with title to property.			
Public Access Considerations	State Highway 350 crosses PW25D. Wallowa County Road No. 727 crosses all parcels.	State Highway right-of-way held in fee by State. Acquisition of parcel would be subject to county right-of-way.			
Site Conditions	Homestead straddles PW25B&E and PW27C. Includes house, barn, corrals, outbuildings, and railcar bridge. Portion of PW25D has been developed for agricultural and ranching use immediately adjacent to the town of Imnaha.	A 10-acre parcel occupying the site would be delineated and removed from exchange consideration. That portion of this parcel lying in the NE¼NE¼ of section 21 would be removed from further consideration.			
Encumbrances	Utility line easement to Idaho Power Co. across PW25B, PW25C, PW25D, PW25E, PW27A, and PW27C. Utility line easement to Pacific Power Co. across PW25B, PW25C, PW25D, and PW25E. Easement to Wallowa County for Co. Road 727 over all parcels.	Parcels would be acquired subject to the terms and conditions of these easements, all of which are acceptable to the US.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Special Characteristics	Portions of these seven parcels lie within the Wild and Scenic River boundary. All seven parcels are located within the boundary of the HCNRA.	Lands within W&S boundary would be withdrawn from entry, sale, or other disposition under public land laws. Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW26A, B & C/ MAP 6			✓		✓
Public Access Considerations	Dispersed, undeveloped campsites are numerous on these parcels.	Acquisition of parcel would eliminate conflicts over public use of private lands.			
Special Characteristics	All three parcels are located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW28/Map 6			✓	✓	✓
Special Characteristics	Parcel is located within the boundary of the HCNRA.	Lands would be withdrawn from location, entry, and patent under Mining laws following acquisition.			
PW29/Map 5			✓	✓	✓
Public Access Considerations	US does not hold easement on Trail No. 1879 across this parcel	Acquisition of parcel would eliminate need to acquire easement.			
Special Characteristics	This parcel lies within the boundary of the Hells Canyon Wilderness Area.	This parcel would become wilderness and be withdrawn from all forms of appropriation under the mining laws and from disposition under mineral leasing laws.			
PW30/Map 7			✓		
Appurtenant Water Rights[1]	One livestock reservoir located on this parcel.	Water Right would transfer with title to the property.			
Encumbrances	Road Easement to Boise Cascade across this parcel.	Property would be acquired subject to terms and conditions of the easement, all of which are acceptable to the US.			
PW31 & 32/Map			✓		✓
Access Considerations	Legal, but no roaded, access to these two parcels.	Would secure legal roaded access to these parcels as part of acquisition.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
PW33/Map 7					
Water Rights/Site Conditions[1]	Water right for domestic spring and wildlife reservoir are located on parcel. Cabin and shed located on structures.	Water rights would transfer with title to property. FS preference is that structures be removed.			
PW34A&B/Map 7			✓		✓
Appurtenant Water Right[1]	Right to irrigate 37.3 acres from Joseph Creek.	Water rights would transfer with title to property. Provide for domestic water use for retained acreage prior to acquisition.			
Site Condition	Home site, barn, hay sheds, and corrals located on PW34B.	A 10-acre parcel occupying the site would be delineated and removed from further exchange consideration.			
PW38/Map 4			✓		
Appurtenant Water Right[1]	One livestock/wildlife reservoir located on this parcel.	Water Right would transfer with title to the property.			
Public Access Considerations	US does not hold easement on Forest Road #7020175 across the parcel.	Acquisition of parcel would eliminate need to acquire easement.			
Site Condition	Sparta Ditch crosses parcel.	Acquisition of the parcel would allow for evaluation for possible inclusion in National Register of Historic Places.			
Encumbrance	Fiber Optic line crosses parcel. No easement noted on title report.	Would request landowner to issue easement prior to acquisition. OR - Would add lands to already existing special use permit for this facility.			
PW39A, B & C MAP 1			✓	✓ 39 C	✓ 39 C
Appurtenant Water Rights[1]	Seven livestock/wildlife reservoirs, from springs and tributaries of Mud Creek, located on this parcel.	Water rights would transfer with title to property. Submit updated reservoir location map to OWRD.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Site Condition	House, sheds, barn, and corrals located on PW39B.	FS preference is that structures would be removed prior to acquisition and that domestic water system would be decommissioned.			
Public Access Considerations	US does not hold easement on portions of Rd. #3040 across PW39A and PW39B.	Acquisition of parcel would eliminate need to acquire easement.			
PW40/Map 1			✓		
Appurtenant Water Rights[1]	Five livestock reservoirs are located on this parcel.	Water rights would transfer with title to property. File for water right.			
Site Conditions	Two log structures, which are badly deteriorating, are located on this parcel.	No further action needed.			
PW44A&B/Map 11			✓		✓
Public Access Considerations	Oregon State Highway 244 crosses PW44B.	Highway Right-of-Way is held in fee by the State of Oregon.			
Site Conditions	PW44A recently logged, with piles remaining.	Slash disposal, reforestation, and soil stabilization conditions would meet or exceed Oregon State Forest Practices Act standards prior to acquisition.			
Access Considerations	Legal, but no roaded, access to PW44A.	Would secure legal roaded access to this parcel as part of acquisition.			
PW47A & B/Map 4			✓	✓	✓
Public Access Considerations	US does not hold written easement on Trail No. 1830/1816 across this parcel.	Acquisition of parcel would eliminate need to acquire easement.			
Special Characteristics	This parcel lies within the boundary of the Eagle Cap Wilderness Area.	This parcel would become wilderness and be withdrawn from all forms of appropriation under the mining laws and from disposition under mineral leasing laws.			

Table 90. Non-Federal Parcel Land Use Considerations by Alternative (continued)

Land Use	Specifics	Curative Action	Included In Alternative		
			1	3	4
Encumbrance	Terms and conditions of original mineral survey patent.	Property would be acquired subject to these terms and conditions, all of which are acceptable to the US.			
PW48/Map 8			✓	✓	✓
See PW3, 4, 5 & 48 above					
PW50/Map 7			✓		
Appurtenant Water Right[1]	Five livestock reservoirs are located on this parcel.	Water Right would transfer with title to the property.			
PW51A, C & D/ Map 7			✓		✓
Appurtenant Water Right[1]	Two livestock reservoirs located on PW51A. One has water right, other does not.	Water Right would transfer with title to the property. Apply for water right on second reservoir.			
Encumbrances	Road Easement to Boise Cascade across all three parcels.	Property would be acquired subject to terms and conditions of the easement, all of which are acceptable to the US.			
	One-half interest in all minerals is outstanding to a third party on 40 acres of PW51D.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
	Coal, oil, gas and other minerals rights are outstanding to a third party on 40 acres of PW51C and 40 acres of PW51D.	Exchange facilitator would acquire mineral rights prior to US acquisition of property. US would acquire both surface and mineral rights.			
PW52/Map 7			✓		
Appurtenant Water Right[1]	One livestock reservoir located on this parcel.	Water Right would transfer with title to the property.			
Encumbrances	Road Easement to Boise Cascade across all three parcels.	Property would be acquired subject to terms and conditions of the easement, all of which are acceptable to the US.			

1) History of use, and therefore current status of some water rights may be dubious.

Environmental Consequences

The FS and facilitator, Clearwater, have agreed to comply with the curative action items identified in Tables 88 and 89 for the Proposed Action Alternative. These tables also identify which curative actions that would apply to alternatives 3 and 4. The FS and the private landowners would be responsible for curative actions identified for alternatives 3 and 4.

Facilities

The objective of this section is to disclose information related to facilities the FS would like to acquire. The analysis area boundary is parcels to acquire with existing structures and other improvements.

Facilities and parcel inspections were completed by a team of specialist trained to identify basic issues of noncompliance with structures and lands. The majority of the team's focus was on hazardous materials/wastes and solid wastes which is addressed in the Hazardous Materials section. Refer to the Hazardous Materials section for a listing of parcels where structures currently exist. It is the preference of the FS that all of these structures be removed (with the exclusion of PM26 and PW48) as a condition of the exchange. If the structures are not removed and the decision is to acquire the parcel in its present condition, including structures, additional costs would be incurred.

Regulations Applying to the Analysis

In general, the FS is in a downward trend in acquiring, constructing, replacing, and repairing facilities. Given this trend, it was recognized that it is important the facilities within an acquisition plan are not a burden to the financial situation. Region Six management direction is not to acquire facilities (i.e. buildings, water systems, wastewater systems, etc.) unless it can be shown to be in the best interest of the government and the public. A preliminary evaluation of the following facilities has determined it would be in the government's best interest to acquire them. The PR has documentation related to the evaluation of these facilities.

Affected Environment

PM26 contains a small one-room cabin (600+/- sf), outhouse (20 +/-sf), hay shed (200+/- sf), and corrals. The current use is for range management. Propane gas is the fuel used on site. The FS would like to acquire this parcel with all structures "as is" under the Proposed Exchange or Deed Restriction alternatives. The facilities would be retained for their historical values. They would not be maintained or upgraded for other uses, thereby not taxing limited facilities maintenance funding.

PW 48 is known as the Litch Ranch. The parcel consists of a cabin (1000+/- sf), horse barn (1500+/- sf), shed (200+/- sf), outhouse (20+/- sf), corrals, water system, with propane fuels. The FS would like to acquire this parcel with all structures "as-is" under all action alternatives. The water system would be decommissioned or improved with proper analysis after the acquisition. Prior to acquisition, the current landowner would remove all household hazardous wastes as described in the Hazardous Materials section. The buildings on this parcel appear to have historical significance. Until further evaluation is completed, they would be managed as though they are eligible for the National Register of Historic Places. Acquisition of the property would facilitate recreation management of the HCNRA. The property could be used by the FS as a staging area for trail crews during the spring and early summer months to access the Lord Flat/Summit Ridge/Dorrance Cow Camp area.

The following Table 91 summarizes Parcel/Facilities Acquisition Proposals.

Table 91. Facilities Acquisition Summary

Parcel #	Category	Sub-Cat.	Size (SF)[1]	Proposed Actions Needed[3]	Notes for future planning[2]
PM26	Housing	Cabin	600	2, 3a,	4a
	Storage	Shed	200	2, 3a,	4a
	Service	Pit Toilet	20	2, 3a,	1, 4a
PW48	Housing	Cabin	1000	2, 3a,	4a
	Storage	Barn	1500	2, 3a,	4a
	Storage	Shed	200	2, 3a,	4a
	Service	Pit Toilet	20	2, 3c	1, 4a
				Total Cost Of Acquisition[3]	$20,000[2]

1) Estimated based on site visit information, actual size may vary
2) Total cost with 2004 dollars; future cost should consider inflation. This is a one time estimated cost of acquisition for these sites. The cost includes historic evaluation, recording, and management/retention of site for its historic value.
3) See list of actions below

Actions and Notes for future planning
1) Consider possible replacement depending on use.
2) Requires Lead Paint and Asbestos materials report prior to acquisition
3) Building would be coded as: a) Decommission; b) Develop for Alternative Use; or c) Retain for Existing Use. (Decommissioning for historical buildings means that the buildings would be retained for their historic value, but would not be maintained or upgraded for other uses.)
4) Building Condition Index: a) Abate Major Hazards; b) Maintain Until Retirement; c) Keep Operational; d) Repair Critical Services; e) Highest Quality, Like New

Environmental Consequences

The FS is currently in a down sizing trend. Facilities and parcels with observed deficiencies have been identified, listed, and logged with a recommended action. These recommended actions are considered to be the minimally acceptable actions necessary to endorse parcels for acquisition. Estimated costs to the government beyond the acquisition have been identified in Table 91.

Property Boundaries

The Resources Planning Act targeted all property boundaries to be posted by the year 2020. The Umatilla, Malheur and Wallowa-Whitman National Forests have been systematically surveying, posting, marking and maintaining boundaries in accordance with the budgets allotted for this activity. This section discloses the anticipated costs associated with property boundaries by alternative.

Total boundary cost and saving calculations for the period it would take to complete all landline location were made from the three Forest's Cadastral Landline Status Inventories. Total miles of maintenance, boundary removal, and new boundary marking needs were calculated by parcel for each action alternative. One-time maintenance costs were estimated to be $2,000 per mile; boundary removal costs were estimated at $650 per mile; and new boundary marking costs were estimated to be $10,000 per mile. Refer to the PR for a detailed cost/savings analysis by Forest. Refer to the following Social and Economic section for a detailed cost/savings analysis in Table 115.

Table 92 shows miles of boundaries eliminated, boundaries created and total savings by alternative.

Table 92. Property Boundary Status and Savings by Alternative

	Boundary Eliminated		Boundary Created	
	Marked Miles	Unmarked miles	New Miles	Total Savings
Alternative 1	261	156	75	$1,163,194
Alternative 2	NA	NA	NA	NA
Alternative 3	12	36	11	$265,338
Alternative 4	52	94	69	$331,572

Alternative 1: Proposed Exchange

This alternative would reduce the miles of National Forest boundary that would need to be surveyed and posted on the three forests involved by approximately 81 miles. After considering costs for maintenance and for removal of boundaries not needed, the total net savings to the FS would be approximately $1,163,194. The eliminated 261 miles of marked boundary would not have to be maintained in the future and would not be exposed to possible encroachments or adjacent owner activity.

Alternative 2: No Action

Since no land would be exchanged under this alternative, Federal property boundaries would remain the same. All established marked boundary lines would continue to be maintained and unmarked boundaries would be surveyed in accordance with attainment goals and budgets. Existing encroachments identified on NF parcels to convey under Alternative 1 would be resolved as budgets allowed.

Alternative 3: Purchase

This alternative would reduce the miles of FS property boundary that would need to be surveyed and posted on the three forests involved by approximately 25 miles. After considering costs for maintenance and for removal of boundaries not needed, the total savings to the FS would be approximately $265,338. The eliminated 12 miles of marked boundary, which represents less than 5% of the eliminated boundary under Alternative 1, would not have to be maintained in the future.

Alternative 4: Deed Restriction

The Deed Restriction Alternative would reduce the miles of FS property boundary that would need to be surveyed and posted on the three forests involved by approximately 25 miles. After considering costs for maintenance and for removal of boundaries not needed, the total savings to the FS would be approximately $331,572. The eliminated 52 miles of marked boundary, which represents less than 20% of the eliminated marked boundary under Alternative 1, would not have to be maintained in the future.

Heritage

The objective of this section is to identify heritage resources or properties on NF parcels to convey that may be adversely affected. The analysis area boundary is limited to the Federal parcels involved in the Proposed Land Exchange.

Laws and Regulations Applying to the Analysis

The National Historic Preservation Act (NHPA) of 1966 established the Federal government's policy on historic preservation and related programs, including the National Register of Historic places (NRHP), through which that policy is implemented. Under the NHPA, historic properties include "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (16 United States Code [USC] 470w (5)). The criteria used to evaluate the

NRHP eligibility of properties affected by Federal agency undertakings are contained in 36 CFR 60.4 and are as follows:

Section 106 (16 USC 470f) of the NHPA requires Federal agencies, prior to taking action to implement an undertaking, to take into account the effects of their undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment regarding the undertaking.

Affected Environment

Heritage resource inventories were completed from 1998 through the spring of 2004 on all Federal parcels proposed for conveyance. Numerous separate inventories were completed on the Malheur NF, Umatilla NF, and on the Wallowa-Whitman NF.

Through a records search each heritage resource inventory compiled and recorded pertinent environmental background, American Indian history and non-Indian history. This research also included a review of the appropriate Forest site files and a check of the heritage resource overview of the Malheur, Umatilla, and Wallowa-Whitman National Forests. The heritage resource inventories and associated records are filed in the PR or appropriate Forest Heritage Resource file.

The inventories for the Umatilla NF and Malheur NF were based on individual Forest survey designs that had been approved by Oregon State Historic Preservation Office (SHPO) (Thomas 1991).

The Wallowa-Whitman NF used the Stratified Inventory Probability Sample (SIPS) system. All areas delineated by SIPS were examined by use of pedestrian transects. The transect intervals varied and were largely dependent on the anticipated site density, steepness of the inventoried area and ground visibility of a given survey area. In areas of dense ground vegetation cover (e.g., vegetation, forest duff), surface debris was periodically removed to mineral soil. Windows of opportunity (gopher mounds, wind fallen rootwads, road cuts or erosive areas) were closely examined.

The result of the heritage resource surveys on the FS parcels to convey in the proposed Blue Mountain Land Exchange revealed several sites and isolates that required additional field review to determine status for their National Register eligibility. Based upon the additional field reviews it has been determined that there are no sites eligible for the National Resister of Historic Places on Federal parcels currently considered for conveyance in the Proposed Land Exchange.

Environmental Consequences

Alternative 1: Proposed Exchange

An appropriate inventory has been conducted for the Federal parcels involved in this alternative. Federal parcels with potential impacts to heritage resources have been dropped from this alternative; therefore all potential impacts to heritage resources have been avoided by redesigning the Proposed Exchange Alternative. Consequently, conveyed Federal parcels in this alternative would have “No Effect” on any National Register listed or eligible heritage resources. The Forest Archaeologist has reviewed all Heritage Resource Inventory Reports for compliance with the NHPA of 1966, Protection of Historic Properties, and Programmatic Memorandums of Agreement and has forwarded his recommendations and copies of reports to the Oregon State Historic Preservation Office.

Existing Federal laws and related programs would protect any heritage resource sites on the private parcels to acquire.

Alternative 2: No Action

Site degradation from current environmental stresses such as weathering would continue on sites that have been determined to not be eligible for the NRHPs with no additional impacts on Federal parcels. Heritage resource sites on private parcels would continue to lack special protective measures.

Alternative 3: Purchase

Site degradation from current environmental stresses such as weathering would continue on sites that have been determined to be eligible for the NRHPs with no additional impacts on Federal parcels.

Existing Federal laws and related programs would protect any heritage resource sites on purchased private parcels.

Alternative 4: Deed Restriction

This alternative would result in the same effect to Federal parcels as described under Alternative 1.

Existing Federal laws and related programs would protect any heritage resource sites on the private parcels to acquire.

American Indian

Exercise of American Indian Treaty Rights and Cultural Uses

The FS, through the Secretary of Agriculture, is vested with statutory authority and responsibility for managing resources of the National Forests. No sharing of administrative or management decision-making power is held with any other entity. However, commensurate with authority and responsibility to manage is the obligation to consult, cooperate, and coordinate with Federally recognized Indian Tribes in developing and planning management decisions regarding resources on NFS lands that may affect tribal rights established by treaty or Executive Order. The Proposed Land Exchange occurs within areas ceded to the United States government by the following recognized tribes: the Confederated Tribes of the Umatilla Indians (CTUIR) by the *Treaty With The Wallawalla, Cayuse, etc*., 1855; the Nez Perce Tribe by the *Treaty With The Nez Perce*, 1855; the Burns Paiute Tribe, by Executive Order; and the Confederated Tribes of the Warm Springs Reservation by the *Treaty With The Tribes Of Middle Oregon* in 1855. As a result of the treaties and Executive Orders, elements of Indian culture, such as tribal welfare, land, and resources were entrusted to the United States government.

The FS shares in the Federal government's overall trust responsibility where treaty, laws, Executive Orders, case law, or other legally defined rights apply to NFS lands. (Article 1, Section 8, Clause 3 of the United States Constitution authorized Congress to regulate "commerce … with Indian tribes."). Trust responsibilities resulting from the Treaties or Executive Order dictate, in part, that the United States government facilitates the execution of treaty rights and traditional cultural practices of recognized tribes. The FS assists with this shared responsibility by working with the tribes on a government-to-government basis and in a manner that attempts a reasonable accommodation of their needs, without compromising the legal positions of the Tribe or the Federal government.

Tribes have expressed rights reserved in the treaties. The treaties state "That the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians; and at all other usual and accustomed stations, in common with citizens of the United States, and of erecting suitable houses for curing the same; also the privilege of hunting, gathering roots and berries, and pasturing their stock on open and unclaimed lands, in common with citizens, is secured to them" (Treaty with The Tribes of Middle Oregon and Treaty With The Walla Walla, Cayuse, etc. The Treaty with the

Nez Perce has similar language.). Much of the Federal lands are considered open and unclaimed lands for the purpose of exercising treaty rights. It is the responsibility of the FS to ensure the objectives above can be met and to address interests in managing and restoring habitat to support healthy, sustainable, and harvestable populations of culturally significant vegetative floral and faunal species. Although the Treaties do not specifically mandate the Federal government to manage habitats, there is an implied assumption that an adequate reserve of water be available for executing treaty related hunting and fishing activities.

The Proposed Land Exchange also includes areas currently utilized by non-treaty Executive Order Tribes that do not hold specific reserved rights. Utilization of NFS lands for all Federally recognized Tribes is protected by American Indian Religious Freedom Act, Executive Order 13007 – Sacred Sites, Executive Orders 13084 & 13175 – Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898 – Environmental Justice.

Affected Environment

All areas of interest are recorded on maps located in the Interior Columbia Basin Ecosystem Management Project Document.

Burns Paiute Tribe

Their reservation lands are located near Burns, Oregon. Their primary interest area includes lands on the Malheur National Forest and the southern portions of the Umatilla National Forest and Wallowa-Whitman that includes the John Day and Burnt River systems. Other areas of interest include the Malheur, Powder, Silvies, Crooked, Blitzen, and Owyhee Rivers plus Harney and Malheur Lakes. The tribe became recognized by an Executive Order of March 1872 that also established the 1,778,560-acre Malheur Indian Reservation. In 1883 another Executive Order dissolved the reservation. They had signed a treaty in the 1860s that was never ratified by Congress.

The Tribe is associated with the northern division of the Paiute peoples. The original homelands included southeast Oregon, most of northwest Nevada and a portion of southwest Idaho. The Burns Paiute are composed of bands that were historically centered near Malheur and Harney Lakes, uplands of the Crooked River, the upper John Day, Fort Bidwell, and Owyhee River lowlands. The Burns Paiute Tribal members continue to hunt and gather traditional foods. Roots such as camas, bitterroot, and biscuit root are dug in the spring. In late summer chokecherries and berries are gathered. People also gather willow and tulle for making baskets and cradleboards. Other crafts traditional to the Burns Paiute, which are practiced in the community, include beadwork and drum making. The hunting of elk, deer, quail, and groundhog as supplemental food sources continue as well.

Confederated Tribes of the Umatilla Indian Reservation

The Cayuse, Walla Walla, and Umatilla tribes make up the members of this reservation. Their reservation lands are adjacent to the Umatilla National Forest and the city of Pendleton, Oregon. Their interest area includes the Malheur River and Malheur and Harney Lakes to the south, the Grande Ronde and lower Snake River in the east and north, the Yakima, John Day, and Umatilla Rivers and the Columbia River from Vantage, Washington, to west of the Dalles, Oregon. Important river fisheries include the Grande Ronde, Imnaha, John Day, Tucannon, Walla Walla, Wallowa, Touchet, Umatilla, Columbia, and Minam along with their tributaries. The Tribe has been active with salmon restoration in the Umatilla and Walla Walla Rivers and in returning water to these two streams in order to maintain migratory routes. The Proposed Land Exchange would acquire parcels in the headwaters of Meacham Creek (a tributary of the Umatilla), the John Day System, and the lower Imnaha River.

Confederated Tribes of the Warm Springs Reservation

The Wasco Bands, the Warm Springs Bands, and the Northern Paiutes are members of the reservation. Their area of interest includes Malheur and Harney Lakes in the southeast to the headwaters of the Deschutes River in the southwest, crossing Mount Hood to west of Portland, and along the Columbia River to the mouth of the Snake River along with the John Day system. There are family connections with the Umatillas. Important streams to them are the Columbia, Crooked, Deschutes, Hood, and John Day Rivers and Fifteen Mile Creek. Their Treaty ceded the majority of the John Day system to the United States.

Nimi'ipuu (Nez Perce)

Their Treaty established a reservation for the Nez Perce tribe. The reservation is located along the Clearwater River, east of Lewiston. Their area of interest includes lands east of the Snake River as far north as Coeur d'Alene. It extends westward including the Snake and Palouse Rivers and the Columbia to The Dalles. To the south it includes the North Fork of the John Day to the confluence of the Malheur and Snake Rivers. Important streams include the Clearwater, Grande Ronde, Imnaha, Powder, Rapid, Salmon, Lower Snake, Lochsa, Selway, and Columbia Rivers.

Deep canyons were the traditional Nez Perce tribal lands. They traveled with the seasons relying on the rivers, mountains, and prairies for sustenance. In early spring, the women traveled to the lower valleys to dig root crops and the men traveled to the Snake and Columbia rivers to intercept the early salmon runs. In mid-summer all the people of the village moved to higher mountainous areas setting up temporary camps to gather later root crops, fish the streams, and hunt big game. By late fall, they settled back into their traditional villages along the Snake, Clearwater, and Salmon rivers. Salmon and other fish, game, dried roots, and berries provided winter foods.

The basic roots gathered for winter storage included camas bulb (kehmmes), bitterroot (thlee-tahn), khouse (qawas), wild carrot (tsa-weetkh), wild potato (keh-keet), and other root crops. Fruit collected included serviceberries, gooseberries, hawthorn berries, thorn berries, huckleberries, currants, elderberries, chokecherries, blackberries, raspberries, and wild strawberries. Other food gathered includes pine nuts, sunflower seeds, and black moss.

Fort McDermitt Paiute-Shoshone, and Shoshone-Paiute Tribe of Duck Valley

These tribes are located in southeast Oregon and northern Nevada. Their area of interest overlaps at the Malheur and Owyhee Rivers. These tribes would not be impacted by the land exchange because no parcels are located in their area of interest.

Environmental Consequences

Letters were sent to Tribal leaders of the Nez Perce, Burns Paiute, CTUIR, Warm Springs, Fort McDermitt Paiute-Shoshone, and Shoshone-Paiute Tribe of Duck Valley. All tribes have responded verbally or in writing to the letter. Both the Nez Perce tribe and CTUIR have been instrumental in bringing treaty issues forward. The FS has had several meetings with both the Nez Perce tribe and the CTUIR individually throughout the process. The Umatilla NF and the CTUIR have jointly looked at the parcels on Horseshoe Ridge. Both the Walla Walla District Ranger and the Umatilla NF Forest Supervisor have met with the CTUIR on several occasions. Through these meetings and letters of response many concerns have been shared. All action alternatives have attempted to address these concerns (see summary of issues at the end of Chapter 2.

Access for Traditional Uses and the Exercising of Treaty Rights

Alternative 1: Proposed Exchange

Under this alternative, isolated parcels and NFS lands along the three forests boundaries would be exchanged for interior private lands. The acquisition of the interior lands would reduce the risk of accidental trespass onto private lands and consolidate Federal lands in the anadromous fish portions of the Imnaha and North Fork John Day Rivers. NFS lands available for traditional use would increase by approximately 13,570 acres. Conveyed Federal lands would no longer be available for exercise of Treaty rights. For example, a Tribal member may be impacted by the loss of public lands conveyed to private ownership. The ability to exercise treaty rights would remain because similar upland habitat would be acquired and would be available for traditional uses. Although similar habitats are being acquired and a greater number of acres are being acquired, no assessment of quality has been made. Road and trail access to public lands that provide for the exercise of traditional uses would be unchanged because there would be no change in travel management plans or rights-of-ways. Any roaded access to the newly acquired lands would be retained by the FS for public access as part of the transfer of property. Future changes in motorized access would be addressed with the appropriate documentaion.

Lands proposed for conveyance in the Meacham Creek and Butcher Creek areas (CTUIR ceded lands) would cause individual tribal members of the CTUIR to shift to other areas for hunting. Ridgetop walking access to the upper Butcher Creek canyon would be lost. The acquisition of lands on Horseshoe Ridge provides an area with year round roaded access and would be the likely place that hunting could shift to. The quality of hunting is likely to be similar since it is in the same GMU and is located near the conveyed acres. Alternative 1 does not affect the access to lands north of Butcher Creek and south of Meacham Creek, parcels FU3A, B, C, D, and E that comprise approximately 3,440 acres. Though the FS would convey these lands, there currently is no roaded public access to this area. Walking access is very difficult because of having to climb into and out of the Butcher and Meacham Creek canyons. In summary, the FS would have a net loss of approximately 1,300 acres in Meacham and Butcher Creeks under Alternative 1, however this alternative would block up Federal land ownership on Horseshoe Ridge and in the lower portions of Meacham and Butcher Creeks, important anadromous fisheries habitat and root gathering areas. It would also increase roaded access to public lands.

The CTUIR has expressed very specific concern over parcels FU3E and 4; these parcels have historically been used by a family unit. Under Alternative 1 the family would be displaced. Although, there may be a comparable unit for that family to be displaced; the sense of place and family history would be lost.

The last land exchange in the Meacham Creek area occurred in the mid 1990s, east of the current Proposed Land Exchange. In that exchange, the FS acquired approximately 1,160 acres and conveyed approximately 1,600 acres in the Meacham Watershed. The FS acquired a total of 2,200 acres in the Umatilla Watershed including Meacham. Historically the FS has been acquiring lands along Meacham Creek. Previous land exchanges have been supporting tribal concerns for salmon recovery by acquiring stream habitat in areas with limited access. Previous land exchanges in the Meacham and Imnaha drainages have achieved little in providing access for Treaty Rights. These drainages are within gorges with little to no road access. Accessing these areas requires strenuous walks over very steep, 60 to 80 percent, slopes. Under Alternative 1, there would be no road decommissioning proposed in the foreseeable future that would reduce access to acquired remote parcels. Roads on acquired parcels could be closed. Seasonal openings could be arranged for some cultural uses, such as gathering. These changes could be made in the future with appropriate documentation and processes. The parcels conveyed would not impact access for traditional uses.

Summary- Alternative 1

Acres available for exercising treaty rights would change by watershed. Most watersheds would have a net gain of acres; that is National Forests would acquire more acres than they would convey. Only the Umatilla Watershed (loss of approximately 2,250 acres) and the Upper Grande Ronde (loss of approximately 800 acres) would have a net reduction of NFS lands. Alternative 1 continues the trend of past land exchanges where upland habitat is conveyed in exchange for acquisition of stream habitat. Similar upland habitat is found in other locations on both the acquired lands and remaining NFS lands. Tribal use of upland habitat would change to new locations. The FS would retain rights-of-way for roads on ceded lands when they are needed to access acquired lands or other NFS lands and would relinquish rights-of-way on ceded lands when the roads or trails no longer provide access to NFS lands. Public rights-of-way would also be secured to access the new acquired lands. The exchange would retain or acquire rights-of-way to provide access and a later roads analysis would determine open, closed and season roads as well as maintenance levels. Access to NFS lands would not be reduced by this land exchange.

Alternative 2: No Action

There would be no changes in acres of NFS lands and no changes to access for traditional uses. Remote areas with difficult and steep access would remain, as they currently exist. Road and trail travel management and rights-of-ways would remain as they currently exist. The potential for trespass on private inholdings would continue.

Alternative 3: Purchase

Under this alternative, the majority of the acres purchased would be in the Imnaha drainage; 3,180 acres of the 4,250 acres. No acres would be purchased in the Umatilla drainage. The purchase of parcels would not adversely impact access for traditional uses and the exercising of treaty rights. Access and travel management and road rights-of-ways would essentially remain unchanged. Accessing the lands purchased in the lower Imnaha and within the HCNRA would require using the current trail system. The purchase would acquire additional riparian habitat along the Imnaha, a high priority fisheries habitat, and extends the connection of high quality habitat under Federal protection in support of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program. There would be substantially less acres of high quality riparian habitat becoming NFS lands than proposed in Alternative 1.

Alternative 4: Deed Restriction

Alternative 4 would result in a net decrease of approximately 1,050 acres of NFS lands because of the loss in value of National Forest lands with deeded covenants.

There would be a net loss of approximately 3,120 acres of NFS lands in the Meacham Creek watershed. Approximately 3,440 acres in the area north of Butcher Creek and south of Meacham Creek would be conveyed. This area does not have public access by roads and can only be accessed by a long, arduous walk. Current access to traditional use sites on conveyed parcels would be retained through deeded covenants. These covenants would cause no displacement of a family unit.

The lands acquired by the FS in Alternative 4 are those important to anadromous fisheries along Meacham Creek and Joseph Creek, and the Imnaha, North Fork John Day, and Middle Fork John Day Rivers. Alternative 4 would not block up the NFS lands on Horseshoe Ridge as would occur in Alternative 1 and not provide as many acres of easily accessible land for gathering as Alternative 1. Since access for treaty rights would be retained in the deed, the walk into northern Butcher Creek would be unchanged.

The impacts to access for traditional uses and exercise of treaty rights would be similar to that disclosed for Alternative 1 although there would be a net loss of NFS lands. The past land exchanges have blocked up important riparian habitat as would this alternative. This alternative would provide added protection of riparian habitat in high priority fisheries habitat, connecting quality habitat in support of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program.

Impacts to Open and Unclaimed Lands

Open and unclaimed lands are public lands that the treaties state the tribes have "the privilege of hunting, gathering roots and berries, and pasturing their stock on open and unclaimed lands, in common with citizens" (Treaties). The action alternatives would impact the amount and location of open and unclaimed lands within treaty areas (tables 93, 94 and 95).

Table 93. Summary of Open and Unclaimed Lands within Treaty Areas

Treaty Area	Total Ceded Lands (Acres)	Lands Held by States (Acres)	Federal Lands (Acres)	County and Other Lands (Acres)	Reservation Lands (Acres)
Nez Perce	8,278,359	35,194	1,983,089	389	750,000
Umatilla	6,522,211	18,012	1,552,669	2,517	172,000
Middle Oregon	4,007,410	44,496	1,823,776	0	650,000
Burns Paiute		31,064	1,798,552	1,704	500
Total	18,807,980	128,766	7,158,086	4,610	1,572,500

Taken from GIS information about ownership
Federal jurisdiction includes major agencies including FS, BLM, Park Service, and Bureau of Reclamation.
County and Other includes minor Federal lands

Table 94. Acres of Conveyed and Acquired Lands by Treaty Area

Treaty	Alternative 1		Alternative 3		Alternative 4	
	Conveyed (Acres)	Acquired (Acres)	Conveyed (Acres)	Purchased (Acres)	Conveyed (Acres)	Acquired (Acres)
Nez Perce	4,610	13,961	0	3,819	4,610	10,494
Umatilla	7,147	5,078	0	87	7,147	2,024
Middle Oregon	6,373	12,702	0	343	6,373	4,601
Burns Paiute	42		0		42	
Total	18,172	31,741	0	4,249	18,172	17,119

Table 95. Changes to the Amount of Open and Unclaimed Federal Lands by Treaty Area

Treaty Area	Alternative 1		Alternative 3		Alternative 4[1]	
	Change in Acres of Open and Unclaimed	Percent Change in Open and Unclaimed Lands	Change in Acres of Open and Unclaimed	Percent Change in Open and Unclaimed Lands	Change in Acres of Open and Unclaimed	Percent Change in Open and Unclaimed Lands
Nez Perce	+ 9,351	+ 0.47 %	+ 3,819	+ 0.19	+ 10,494.	+ 0.53
Umatilla	- 2,069	- 0.13 %	+ 87	+ 0.006	- 1,002	- 0.07
Middle Oregon	+ 6,329	+ 0.35 %	+ 343	+0.02	- 1,772	- 0.10
Burns Paiute	- 42	- 0.002 %		No change	- 42	No change
Total	+ 13,569	+ 0.19 %	+ 4,249	+ 0.06	+ 7,678	+ 0.11

The percent change is based on Federal Lands considered for exchange/purchase

1) Alternative 4 retains access for hunting and gathering on 13 parcels in the CTUIR Treaty Area totaling 4,121 acres and 33 parcels of Nez Perce totaling 4,610 acres. The lands conveyed with deeded covenants are not counted as a loss of open and unclaimed lands. The deeded covenants retain the use of conveyed lands for the exercising of Treaty Rights.

Effects Common to All Action Alternatives

The overall scale of the effect on lands available for exercising treaty rights would not be noticeable at the landscape scale. There would still be over 7 million acres of Federal lands within the lands ceded by treaties (Table 93). The action alternatives would cause very minor changes to lands considered open and unclaimed (Table 95).

Alternative 1: Exchange Alternative

Alternative 1 would have the second highest net increase in open and unclaimed lands with 13,569 acres. This alternative increases open and unclaimed lands by approximately 0.2 percent. Open and unclaimed lands ceded by the treaty with the CTUIR would have a loss of .13 percent. National Forest lands proposed for conveyance within the CTUIR ceded area increases the NFS lands in the Imnaha River drainage, an important anadromous fisheries habitat. Even thought the Imnaha is outside the Umatilla Indian's ceded lands boundary the Umatilla Indians consider it one of their usual and accustomed places for the taking of fish, therefore making it an important area for acquiring fisheries habitat. The 3,344 acres proposed for conveyance within Butcher Creek likely would not impact the amount of open and unclaimed lands available to the CTUIR because there is no public road access, and walks into the area are arduous. Alternative 1 would acquire more open and unclaimed acres on Horseshoe Ridge, an area with roaded access adjacent to the CTUIR Reservation and with habitat providing culturally important root gathering.

The CTUIR expressed concern over conveying parcels FU3E and FU4, 964 acres, because Tribal members hunt in the area. The Horseshoe Ridge lands proposed for acquisition provides root gathering habitat. Parcels FU3E and FU4 do not have roaded access and straddle the Butcher Creek canyon. Alternative 1 would block up NFS lands on Horseshoe Ridge and Meacham Creek, allowing greater access for hunting without potential trespass onto private land. The conveyance of the Highway 84 parcels would require individuals to change locations for hunting. Both the Horseshoe Ridge and Highway 84 areas have similar elevation. The Horseshoe Ridge area peaks at 4,400 feet with the acquired lands occurring at 4,200 feet, then descends into Meacham Creek. The Highway 84 parcels are at 4,200

feet and descend into Butcher Creek. The slope aspects between the two areas are different. Butcher Creek makes an "S" turn through the Highway 84 parcels on an east-west axis providing varied aspects in a narrow, steep canyon. The Horseshoe Ridge area provides south and southwest aspects on not as steep slopes. Acquiring the Horseshoe Ridge lands would likely increase tribal subsistence hunting and root gathering due to easier roaded access, the lands being adjacent to the Reservation, and being in an area that gets fluctuating depths of winter snow with early spring access. Acquiring the Horseshoe Ridge lands would likely improve the ability of the CTUIR to exercise treaty rights and be a benefit to sustaining cultural activities.

Though this proposed land exchange decreases acres within the CTUIR ceded lands boundary, the amount of ceded, open and unclaimed lands has increased in all treaty areas when past land exchanges are added together. The last land exchange from the 1990s increased open and unclaimed lands by over 3,000 acres within the CTUIR ceded lands.

Summary- Alternative 1

The Proposed Land Exchange would be made up of similar habitat types within the Blue Mountain grass tree mosaic. Even though the FS would convey upland habitat for riparian and fisheries habitat, Alternative 1 includes parcels extending above the riparian corridors onto the uplands that replaces habitat conveyed in other locations. The location of open and unclaimed lands would change and the amount of accessible open and unclaimed lands would increase, some of it still with arduous walks.

Alternative 2: No Action

There would be no change in acres or location of open and unclaimed lands.

Alternative 3: Purchase

Alternative 3 would have the least net increase in open and unclaimed lands with 4,250 acres. This alternative increases open and unclaimed lands by approximately 0.06 percent. The purchase of 87 acres would not hve a noticible effect on the amount of open and unclaimed lands within the CTUIR ceded lands boundary.

The purchasing of lands increases the amount of open and unclaimed land with ceded boundaries. The vast majority (3,820 acres) of the acquired lands is located within Nez Perce ceded boundary and also overlaps with the CTUIR's area of interest. As with Alternative 1 there would be a net increase in open and unclaimed lands when combined with past land exchanges, however it would provide the least amount of open and unclaimed lands of the acquisition alternatives.

Alternative 4: Deed Restriction

The overall effects of Alternative 4 would be similar to Alternative 1. The exception is that Alternative 4 would have a net reduction in NFS landsof about 1,050 acres. The deed covenants would retain access and use similar to open and unclaimed lands on approximately 4,121 acres conveyed by the FS. Retaining rights as proposed in Alternative 4 would cause a net increase of approximately 3,071 acres of land in "open and unclaimed status", with a decrease of approximately 1,000 acres in the CTUIR treaty area. There would be a net increase in open and unclaimed lands when combined with past land exchanges, as is the case with Alternative 1.

Cultural Resources

Alternatives 1 and 4: Exchange Alternative and Deed Restriction

Five parcels, totaling 141 acres, have been identified by the CTUIR as places where tribal members hunt and gather roots and berries. One parcel is within 1.5 miles of a traditional fishing area. This parcel is located in uplands and ridgetops over a mile from the Wallowa River along Water Creek Canyon. The conveyance of this parcel would not impact access or use of the fishing site of concern. Conveyance of the parcels would affect tribal hunting and gathering rights as these lands would no longer be available to tribal members to practice these reserved treaty rights.

Alternatives 2 and 3: No Action and Purchase

There would be no impact to cultural resources because no Federal parcels would be conveyed. The existing condition would continue, and American Indian cultural uses would continue on existing Federal lands.

Protecting the Resources in the Treaties

Resources identified in the treaties include, fisheries, hunting, gathering roots and berries, and pasturing livestock. The CTUIR has supported protection of high quality habitat and fisheries restoration projects as demonstrated by their efforts in the Umatilla and Walla Walla watersheds. Other tribes are involved with habitat improvement projects as well. Maintaining and increasing anadromous fish populations helps with their ability to take fish at usual and accustomed places along the Columbia, Umatilla, Grande Ronde, Imnaha, and Snake Rivers and sustains their culture.

The presence of steelhead trout and bull trout and the CTUIR successful restoration of salmon in the Umatilla basin provides the basis for American Indian interest in the land exchanges. The tribes have an interest in maintaining salmon production for exercising cultural fishing activities in usual and accustomed places. The CTUIR has been active with the Northwest Planning Council's 2000 Columbia River Basin Fish and Wildlife Program that proposes increased emphasis on Columbia River sub-basin tributaries for recovery of listed species. The strategy for salmon builds outward from core areas of healthy populations in intact habitat. Habitat protection and recovery tactics would differ depending on whether habitat condition is currently "intact", "restorable", "compromised", or "blocked". Meacham Creek and the Umatilla River have intact, year-round, fisheries habitat. The Imnaha and North Fork John Day Rivers also have quality fisheries habitat located on private lands surrounded by NFS lands.

The CTUIR have an interest related to culturally significant plants within the Umatilla National Forest lands overlapping ceded territory. Gathering roots and berries are an important cultural activity protected by treaties. A botany specialist report was written to identify culturally significant plants within the common lands of the Umatilla N.F. and the ceded territory of the CTUIR. This document describes the 164 presently known culturally significant plants that occur within conveyed and acquired parcels. Tables in this report show total conveyed and acquired acreages by plant association and total acres of plant association groups within the Umatilla NF (within Oregon) and CTUIR ceded lands. A plant association is a plant community with a definable plant composition, uniformity of appearance, stability, and habitat which is able to persist over time within its environment. Each exchange parcel was described in terms of total plant associations present. Plant associations are the smallest and most detailed level of forest management. A total of 39 plant associations describe the lands identified within the scope of this specialist report.

Conveyed lands have been classified by plant associations through botanical field surveys, stand exams, and photo interpretation. Acquired lands have been classified through photo interpretation. The classifications helped determined which culturally significant plants may potentially occur within a given

parcel. By using the Umatilla Biodiversity Index (a 20 year compiled field survey list of plant species occurrences within existing plant associations) it was possible to populate each plant association within exchange parcels with a list of potentially culturally significant plant species (PR).

Table 96 combines the 39 plant associations into 8 plant association groups. A plant association group is a grouping of similar plant associations. These groups include forest types and their unique potential assemblage of culturally significant plant species: Cottonwood/…90 plants, Douglas Fir/…87 plants, Ponderosa Pine/…89 plants, Non-forest/…112 plants, Sub alpine Fir/…80 plants, White Fir/…67 plants, Lodgepole pine/…50 plants, and Western Juniper/…109 plants. A culturally significant plant may be found in more than one plant association group.

Table 96 also provides a comparison of plant associations acquired (+) and conveyed (-) as well as acreages for both. It is important to understand how net potential acreage losses and gains have been calculated for each culturally significant plant association group. The figures in table 96 are an over estimate of the potential acres supporting these plants. Potential net acreage gain or loss for each of the 164 culturally significant plants listed in the specialist report (PR) assumes that every acre of every plant association group supports a given plant. This is of course rarely the case for the following reasons: 1) seldom will a plant species occupy all plant associations in a given plant association group or groups, 2) not every plant association provides optimal conditions for each individual, (actual densities may be quite low and often difficult to detect) and, 3) even under optimal conditions not all sites will be fully occupied. For further detailed information refer to the Botany Specialist report in the PR. These acres represent Blue Mountain Land Exchange acres within CTUIR ceded land within Umatilla NF only.

Table 96. Conveyed and Acquired Acres by Series and Alternative

Alternative 1 (acres)			Alternative 3 (acres)			Alternative 4 (acres)		
Convey	**Acquire**	**Net Change**	**Convey**	**Purchase**	**Net Change**	**Convey**	**Acquire**	**Net Change**
Black Cottonwood								
48	22	-26	0	0	0	48	22	-26
Douglas Fir								
1589	978	-611	0	0	0	1589	243	-1364
Ponderosa Pine								
970	605	-365	0	0	0	970	91	-879
Non-Forested								
1862	1550	-312	0	0	0	1862	458	-1404
Subalpine Fir								
0	0	0	0	0	0	0	0	0
White Fir								
2255	1532	-723	0	12	+12	2255	478	-1777
Lodgepole Pine								
23	0	-23	0	0	0	23	0	-23
Western Juniper								
0	7	+7	0	0	0	0	0	0
Totals								
6747	4694	-2053	0	12	+12	6747	1292	-5455

A minus represents a loss in acres

Effects Common to All Action Alternatives

Hunting and grazing would not be impacted by the action alternatives. The tribes currently do not graze livestock on open and unclaimed lands. Open and unclaimed lands would continue to be available for exercising treaty rights. Open and unclaimed land would retain the ability to productively support the treaty rights for hunting and pasturing of livestock. Refer to the Wildlife section for information concerning cumulative effects analysis on big game species.

All action alternatives would block up areas of high quality fisheries habitat, increase fisheries production, maintain the taking of fish at usual and accustomed places (Wildlife section), and protect water quality. Alternative cumulative effects analysis on water quality is discussed in the Hydrology and Soils sections. All action alternatives would connect and protect areas of refugia. All action alternatives would increase riparian protection by placing more miles of stream under the riparian objectives of PACFISH and INFISH. Many of the parcels proposed for acquisition/purchase would protect pristine riparian and upland habitat. Conveyed parcels do not have irrigateable lands. The parcels are steep with limited access to the quantity of water needed for irrigation. Springs are the primary source of summer water. The action alternatives would not be expected to reduce water to the streams.

Lands acquired/purchased within and adjacent to roadless or wilderness areas have high quality habitat attributes that assist in achieving the goals of the Columbia River Basin Fish and Wildlife Program.

Table 97 shows each action alternative's exchange acre relationship to existing wilderness and roadless areas within ceded lands by treaty or Executive Order.

Table 97. Acres of Roadless and Wilderness Areas within Ceded Lands by Treaty or Executive Order

Total Acres of Ceded Lands	Roadless Acres Including Wilderness	Conveyed Acres within Roadless			Acquired Acres Within or Adjacent to Roadless and Wilderness		
		Alt 1	Alt 3	Alt 4	Alt 1	Alt 3	Alt 4
Middle Oregon							
4,007,410	267,871	0	0	0	314	0	0
Walla Walla Cayuse							
6,522,211	552,643	3		3	340	142	341
Nez Perce							
8,278,359	1,015,027	1,846	0	1,846	9,798	3,293	8,622
Burns Paiute							
	105,458	0	0	0	0	0	0

Table 98 below shows the relationship of each action alternative's exchange acres in watersheds within or adjacent to roadless areas.

Table 98. Proposed Exchanged Acres within or Adjacent to Roadless Areas by Watershed

Watershed	Alternative 1		Alternative 3		Alternative 4	
	Conveyed (Acres)	Acquired (Acres)	Conveyed (Acres)	Purchased (Acres)	Conveyed (Acres)	Acquired (Acres)
Imnaha (Nez Perce Treaty)	846	7,181 within or adjacent to roadless	0	2,681 within or adjacent to roadless	846	7,181 within or adjacent to roadless
Wallowa Lower Grand Ronde (Nez Perce Treaty)	1,000	1,786 within or adjacent to roadless	0	381 within or adjacent to roadless	1,000	610 within or adjacent to roadless
Umatilla (Walla Walla Cayuse)	3	0	0	0	3	0
Upper John Day (Middle Oregon)	0	314 within or adjacent to roadless	0	0	0	0

Alternative 1: Proposed Exchange

This alternative places a strong focus on acquiring lands with potential to protect pristine conditions and connect high quality fisheries habitat. Approximately 33 percent of all the acquired acres in Alternative 1 would be within or adjacent to roadless and wilderness areas. Approximately 10 percent of conveyed lands in this alternative would be in roadless areas. Alternative 1 would acquire substantially more miles of fish bearing streams, perennial (except Alt. 4), and intermittent streams than it would convey. This alternative would have a net gain of approximately 40 miles of fish bearing, 10 miles of perennial, and 96 miles of intermittent streams. The locations of fish bearing streams acquired are lower in the watersheds than that conveyed. The upper reaches that would be conveyed go dry in the summers, particularly Butcher Creek in the Umatilla basin. The conveyed portions of the streams were called fish bearing because steelhead spawn in these reaches before they become dry in the summer. The acquired fisheries habitat is high quality fish rearing habitat and would support reaching population goals for the Columbia River Basin Fish and Wildlife Program.

Alternative 1 would have 0.7 miles net loss of fish bearing streams in Meacham Creek. The major portions of fish bearing streams conveyed by the FS in Meacham Creek are dry during the summer. Steelhead spawn in these streams but rear downstream.

Natural resource projects implemented on NFS Lands either improve or maintain riparian objectives. Implementation of PACFISH and INFISH Standards and Guidelines for FS projects would limit impacts to riparian areas and fish production. Alternative 1 would not be expected to have cumulative effects that would reduce populations of anadromous fish. The connecting of high quality fisheries habitat would help recovery efforts and help reach the goals of the Columbia River Basin Fish and Wildlife Program thereby allowing continual use of culturally important usual and accustomed places for the taking of fish.

Alternative 1 would result in a net loss of land potentially supporting culturally significant plant species within the Umatilla National Forest lands overlapping ceded territory of the CTUIR, but the loss is minimal when considering total acres in the ceded territory (Table 96 & PR).

Alternative 2: No Action

Under this alternative, the current ability to hunt, gather roots and berries, and pasture livestock would not change. Fisheries habitat would continue to be impacted by private ownership and related uses.

Alternative 3: Purchase

Alternative 3 only purchases land therefore no roadless acres would be conveyed. Approximately 81 percent of all purchased acres would be within or adjacent to roadless and wilderness areas. This alternative would have a net gain of approximately 14 miles of fish bearing streams, 2 miles of perennial, and 33 miles of intermittent.

Alternative 3 would result in a minor net gain in land potentially supporting culturally significant plant species within the Umatilla National Forest lands overlapping ceded territory of the CTUIR (Table 96).

Alternative 4: Deed Restriction

This alternative places a strong focus on acquiring lands with potential to protect pristine conditions and connect high quality fisheries habitat. Approximately 52 percent of all the acquired acres in Alternative 4 would be within or adjacent to roadless and wilderness areas. Alternative 4 would have a net gain of approximately 27 miles of fish bearing streams, a net loss of 5 miles of perennial, and a net gain of 43 miles of intermittent streams. This alternative would retain protection of the RHCAs on parcels conveyed by the FS as a deeded convent. Even though the parcels would no longer be NFS lands, riparian buffers would be applied similar to PACFISH and INFISH. The combined acquired and conveyed lands for Alternative 4 would result in a net increase in miles of riparian areas protected by Federal standards within ceded lands; approximately 39 miles of fish bearing streams, 14 miles of perennial, and 117 miles of intermittent. The locations and characteristics of streams acquired and conveyed are similar to the narrative for Alternative 1. Alternative 4 would have a net loss of 1.9 miles of fish bearing streams in Meacham Creek. Alternative 4 would also have a net loss of 4.1 miles in the Upper John Day River. In addition, the deed restriction would provide for “traditional uses of the following parcels for hunting, fishing, and gathering by members of the Confederated Tribes of the Umatilla, as defined in the Umatilla Treaty of 1855, and would be maintained in trust to Tribal members in perpetuity”: FU2, FU3A, FU3B, FU3C, Fu3D, FU3E, FU4, FU5, FU11, FU10B, FU12, FU13, and FU14.

This alternative would not be expected to have cumulative effects with other FS activities that would reduce populations of anadromous fish. The connecting of high quality fisheries habitat would help recovery efforts and help reach the goals of the Columbia River Basin Fish and Wildlife Program thereby allowing continual use of culturally important usual and accustomed places for the taking of fish.

Alternative 4 would result in a net loss of land potentially supporting culturally significant plant species within the Umatilla National Forest lands overlapping ceded territory of the CTUIR, but the loss is

minimal when considering total acres in the ceded territory (Table 96 & PR). This loss would be in excess of twice the acres that would occur under Alternative 1.

Compliance with Other Laws, Regulations and Policies

National Historic Preservation Act
Federal properties proposed for conveyance have been surveyed for historic properties. These surveys, located in the PR, found no historic properties on Federal parcels. The proposed acquired parcels would be surveyed for historic properties at a later time when and if an exchange is approved. Avoidance measures would be implemented where necessary, per Stip.III.B.2 (a-d) of the Programmatic Agreement between the ACHP, the Oregon State Historic Preservation Officer (SHPO), and the USFS Region 6, signed March 1997. Since heritage resources would not be affected by any of the alternatives, there would be no effect to any cultural property listed in, or eligible to the NRHP. Documentation to this effect has been forwarded to the Oregon SHPO, in compliance with the National Preservation Act of 1966 (as amended), 36 CFR 800.4 and the Programmatic Agreement.

American Indian Treaty Rights
The US government is bound to perform its trust duties in a manner that will not diminish, abridge, violate, or abrogate reserved treaty or Executive Order rights. The Umatilla, Wallowa-Whitman, and Malheur National Forests endeavored to solicit the comments from the Nez Perce Tribe, the Burns Paiute Tribe, the Confederate Tribes of the Warm Springs Reservation, the Fort McDermitt Paiute-Shoshone Tribes, the Shoshone-Paiute Tribe of Duck Valley, and the Confederated Tribes of the Umatilla Indian Reservation to determine what effects may occur to Tribal welfare and treaty resources as a result of the Proposed Land Exchange. The Confederated Tribes of the Umatilla Indian Reservation provided comments and visited the Meacham Creek area with the Walla Walla District Ranger and the Forest Supervisor of the Umatilla National Forest. Below is a summary of potential impacts to exercising treaty rights. More detail can be found in the previous narratives.

Fisheries: The Proposed Land Exchange would have no detrimental impacts to fisheries habitat. The exchange would acquire and connect high quality fisheries habitat in the Imnaha, Meacham, the North Fork John Day, Middle Fork John Day and the lower Grande Ronde/ Wallowa Rivers. The acquisition of private lands would increase the stream miles under PACFISH and INFISH riparian protection and standards (Table 99). The improved habitat protection and connection would likely lead to higher anadromous fish populations supporting the goals of the Columbia River Basin Fish and Wildlife Program and helping to maintain the ability of the tribes to fish in usual and accustomed places.

Table 99. Total Stream Type Changes by Alternative

Alternative	Miles of Fish Bearing	Miles of Perennial	Miles of Intermittent
1	+ 40	+ 10	+ 96
3	+14	+ 2	+ 33
4	+27	- 5	+ 43

Viable populations of existing and desired wildlife and plant species: Even with the focus on acquiring high quality riparian habitat, big game populations would remain available for hunting. The uplands would provide winter and spring habitat and the riparian areas would provide summer habitat. It is possible that Alternative 1 would cause Horseshoe Ridge to receive higher hunting pressure from the Tribe because it has roaded access and is adjacent to the Reservation.

Alternative 1 would improve the ability of the CTUIR to gather culturally important root plants. It is the only alternative that blocks up Horseshoe Ridge into Federal lands.

Access: None of the alternatives would change or encumber access to open and unclaimed lands. The Proposed Land Exchange would not change the road and trail access and travel management plans of the Forests. Road rights-of-ways would be unchanged. Access may be arduous for reaching some of the exchange lands within roadless and wilderness areas or the HCNRA. The action exchange alternatives would not pose access restrictions on open and unclaimed lands.

Alternative 4 would provide access on lands conveyed by the use of deeded covenants so it has the appearance of providing more acres of access. The cost for this additional access is likely less lands becoming NFS Lands. This would impact potential root gathering ability that Alternative 1 would provide by acquiring the private lands on Horseshoe Ridge.

Social and Economic Environment

This section addresses the potential social and economic effects of the alternatives evaluated in detail over a 10-year period. The parcels proposed for exchange are distributed across six contiguous northeast Oregon counties: Baker, Grant, Morrow, Umatilla, Union, and Wallowa, with the majority of the exchange lands (approximately 95 percent) located in Grant (28 percent), Umatilla (30 percent), and Wallowa (37 percent) counties. Potential social and economic effects associated with the Proposed Land Exchange include changes in employment, income, government taxes and revenues, and National Forest System (NFS) land management and administration costs. These effects are likely to occur primarily in Grant, Umatilla, and Wallowa counties where the majority of the proposed exchange parcels are located. Although the effects are likely to be relatively small in Baker, Morrow, and Union counties, these counties are also included in the analysis.

Affected Environment

The following presents a general overview of the social and economic conditions of the six counties that comprise the analysis area and provides a baseline that the potential effects of the alternatives may be measured against. The discussion is organized into four topics that address demographic characteristics and trends, employment and the economy, government taxes and revenues, and land management administrative costs, respectively.

Demographic Characteristics and Trends

The following presents a brief overview of population and traditional uses and lifestyles in the six-county analysis area. For additional details, refer to the Social and Economic Environment Resource Report located in the PR.

Population

The six county analysis area had a total population of 137,975 in 2000, with county populations ranging from 7,226 in Wallowa County to 70,548 in Umatilla County. Total population increased in all six counties in the 1990s, with increases ranging from just 1 percent in Grant County to 44.2 percent in Morrow County. The analysis area is sparsely populated, with an average population density of 7.7 persons per square mile compared to a statewide average of 35.6 persons per square mile. County population densities ranged from just 1.8 persons per square mile in Grant County to 21.9 persons per square mile in Umatilla County (U.S. Census Bureau, 2003). The area's population tends to be concentrated along the Interstate-84 corridor, with approximately 37 percent of the six-county area's population residing in Baker City, La Grande, Pendleton, or Hermiston in 2000. The main population centers in Grant and Wallowa counties are the John Day and Wallowa River valleys, respectively.

Boardman and Heppner are the largest communities in Morrow County, accounting for approximately 39 percent of total county population in 2000 (Portland State University, 2003a). The analysis area may be generally characterized as a collection of small towns and cities surrounded by NFS, farm, and ranch lands (Oregon Employment Department, 2001a). Federally-managed lands account for about 44 percent of the six-county area, compared to 50 percent statewide. The majority of Federal lands in the study area (89 percent) are NFS lands, with the BLM managing the remaining 11 percent. The percent of Federally-managed lands ranges from approximately 11 percent in Morrow County to 60 percent in Grant County (McGinnis et al., 1996).

Population projections developed by the State of Oregon in 1997 anticipate continued population growth through 2010 in all of the analysis area counties, with total population in the six-county area projected to increase by 8 percent compared to a projected statewide increase of 13 percent. Further population increases are anticipated by 2020 (Oregon Office of Economic Analysis, 1997).

Baker, Grant, Union, and Wallowa counties had predominantly white populations, with more than 90 percent of their populations identifying as White in the 2000 census. Morrow and Umatilla counties were more diverse with relatively large Hispanic/Latino populations, 24.4 percent and 16.1 percent compared to a statewide average of 8.1 percent, respectively. Umatilla County also had a relatively large American Indian population, with 3.2 percent of the population identifying as American Indian compared to 1.2 percent statewide (Social Science Data Analysis Network, 2004).

Traditional Uses and Lifestyles

The following discussion is concerned with the traditional uses and lifestyles associated with the HCNRA. Approximately 8,199 acres of the private lands considered for exchange as part of the Blue Mountain Land Exchange are located within the HCNRA. The Federal parcels considered for exchange include 695 acres located within the HCNRA. This NRA, which was established by Congress in 1975, includes parts of six counties and three states. These counties are Baker and Wallowa in Oregon, Adams, Idaho, and Nez Perce in Idaho, and Asotin in Washington. Approximately 74 percent of the 652,488-acre HCNRA is located in Wallowa County and the entire HCNRA is administered by the Wallowa-Whitman National Forest. While the majority of HCNRA consists of Federal lands, the area also includes approximately 33,000 acres of privately owned lands (FS, 2004b). Private land ownership within the Wallowa County portion of HCNRA is largely concentrated along the Imnaha River canyon, extending south from the town of Imnaha and north from the HCNRA boundary to the confluence of the Imnaha and Snake rivers.

Traditional uses and lifestyles within the HCNRA are based on ranching. Public comment summarized in the HCNRA CMP Final EIS (FS, 2004b) described the traditional ranching culture within the HCNRA as unique to that area, primarily due to the steep terrain and remoteness of the area. Transportation into and within the area was primarily by boat, horseback, or foot, with supplies moved by boat and pack train. General agricultural practices were very similar to those practiced prior to World War II, with horses and mules serving as the primary sources of power for agriculture.

Public comments made during scoping for the proposed Blue Mountain Land Exchange indicated a number of concerns about the private exchange parcels located within the HCNRA. Many people expressed concern that exchanging these parcels would be another step toward all public land in HCNRA, which would change the unique values and character of the area. Concerns were also expressed that a reduction in private lands would reduce future opportunities on the remaining private lands, as well as reducing their value due to uncertainty surrounding future management. One person was concerned about the potential effects of the Proposed Land Exchange on working relationships on the remaining private parcels within the HCNRA (FS, 2003a).

Employment and the Economy

The following provides an overview of employment and the economy in the six potentially affected counties. For a discussion on socioeconomic resiliency, the distressed area index, employment in the analysis area by sector over time, and income and poverty, refer to the PR. The following discusses unemployment and employment by county and provides an overview of the industries (lumber, wood products, recreation and tourism, and agriculture) that could be potentially affected by the Proposed Land Exchange.

Unemployment

Average annual unemployment rates in 2001 ranged from 5.8 percent in Union County to 10.8 percent in Morrow and Wallowa counties, compared to a statewide average of 7.5 percent. Unemployment rates exceeded the state annual average in all of the study area counties with the exception of Morrow. Baker, Grant, and Umatilla counties had 2001 average annual unemployment rates of 8.8 percent, 10.2 percent, and 7.2 percent, respectively. Unemployment rates in all six counties were consistently higher than the state and national averages throughout the 1990s, with the exception of Union County, which had a rate below the state average in 2000 and 2001 (Oregon Employment Department, 2003a).

Employment by County

Employment is summarized by sector and county for 2001 in Table 100. The following paragraphs provide a brief overview of employment trends by county. Emphasis is placed on Grant, Umatilla, and Wallowa counties where the majority of the effects are expected to occur.

Table 100. Total Employment by Sector and County, 2001

	Baker	Grant	Morrow	Umatilla	Union	Wallowa	Oregon
Total full-time and part-time employment (jobs)	8,980	4,505	5,420	38,451	15,144	4,467	2,108,342
Percent of Total Employment							
By Type:							
Wage and salary employment	64	67	75	79	73	55	80
Proprietors employment	36	33	25	21	27	45	20
By Industry							
Farm employment	12	13	21	9	8	16	3
Nonfarm employment	88	87	79	91	92	84	97
Forestry, fishing, related activities, and other	3	8	0	0	0	5	1
Mining	1	0	0	0	0	0	0
Utilities	1	1	3	1	0	0	0
Construction	5	6	4	5	5	7	6
Manufacturing	8	7	15	11	9	6	11
Wholesale trade	2	2	3	2	2	0	4
Retail trade	13	11	7	11	12	12	11
Transportation and Warehousing	3	2	3	7	0	3	3
Information	1	1	0	1	1	1	2
Finance and insurance	3	2	2	3	3	2	4
Real estate and rental and leasing	4	2	2	2	3	4	4
Arts, entertainment, and Recreation	1	1	0	1	2	3	2
Accommodation and food Services	8	5	0	6	6	7	7
Other services[1]	13	8	4	18	19	16	28
Government/government enterprises	15	24	14	18	19	17	13
Federal, civilian	3	6	1	2	2	3	1
Military	1	1	1	1	1	1	1
State and local	11	17	13	16	17	13	11

1) This category is a combination of the following sectors: professional and technical services; management of companies and enterprises; administrative and waste services; educational services; health care and social assistance; and other services, except public administration.
Source: U.S. Bureau of Economic Analysis, 2003b.

Grant County. Total employment increased by just 1 percent in Grant County between 1990 and 2000, with 4,436 full- and part-time jobs identified in the county in 2000. Data for 2001 indicate that the economy of Grant County is relatively specialized in the farm and government sectors, with the farm sector accounting for 13 percent of total employment in 2001 compared to 3 percent statewide (Table 100). The FS is a major employer in Grant County and government accounted for 24 percent of total county employment compared to 13 percent statewide. Grant County is relatively underrepresented in the manufacturing sector, 7 percent of total employment compared to 11 percent statewide, with over 90 percent of local manufacturing related to lumber and wood products (U.S. Bureau of Economic Analysis, 2003a; 2003b).

Agricultural employment remained relatively constant between 1990 and 2000 with total farm employment decreasing by 3 percent or 18 jobs. The manufacturing and Federal government sectors experienced more dramatic declines with respective decreases of 35 percent (239 jobs) and 30 percent (128 jobs) mainly reflecting declines in the wood products industry and associated FS employment (Oregon Employment Department, 2001c; U.S. Bureau of Economic Analysis, 2003a).

Umatilla County. Total employment in Umatilla County increased by 28 percent between 1990 and 2000, with 38,835 full- and part-time jobs identified in 2000. Data for 2001 indicate that government is the largest employer in the county, accounting for 18 percent of total employment compared to 13 percent statewide (Table 100). The county is also relatively specialized in the farm sector, which accounted for 9 percent of total employment compared to 3 percent statewide. The transportation and warehousing sector also plays a relatively important role in the county economy accounting for 7 percent of total employment versus 3 percent statewide. Manufacturing accounts for 11 percent of total county employment, with food production and wood products playing important roles (U.S. Bureau of Economic Analysis, 2003a; 2003b).

Agricultural employment in Umatilla County remained relatively constant between 1990 and 2000 with total farm employment decreasing by 11 jobs or 0.3 percent. Large absolute and relative gains occurred in the retail trade (2,083 jobs; 42 percent) and services (2,835 jobs; 46 percent) sectors. The construction and transportation and public utilities sectors also experienced net job growth over this period, with new projects in the 1990s including co-generation power facilities, a locomotive maintenance facility, a chemical incinerator, and other public building projects (Oregon Employment Department, 2001a; U.S. Bureau of Economic Analysis, 2003a).

Wallowa County. Total employment in Wallowa County increased by 11 percent between 1990 and 2000, with 4,543 full- and part-time jobs identified in 2000. Data for 2001 indicate that government is the largest employer in the county, accounting for 17 percent of total employment compared to 13 percent statewide, with the majority of these jobs located in the state and local government sector (Table 100). The local economy of Wallowa County is also relatively specialized in the farm sector, which accounted for 16 percent of local employment versus 3 percent statewide. Retail trade is the next largest employer, accounting for 12 percent of local employment. The construction and accommodation and food services sectors each account for approximately 7 percent of total employment. The forestry, fishing, related activities, and other sector is relatively important for the local economy, accounting for 5 percent of local employment compared to 1 percent statewide. Manufacturing accounted for just 6 percent of county employment in 2001 compared to 11 percent statewide (U.S. Bureau of Economic Analysis, 2003a; 2003b).

In Wallowa County, agricultural employment decreased by 11 percent (82 jobs) between 1990 and 2000. The manufacturing and Federal government sectors also lost jobs over this period, with respective decreases of 31 percent (185 jobs) and 36 percent (81 jobs) mainly reflecting declines in the local wood products industry and associated FS employment. Covered employment in the wood products sector in Wallowa County declined by 250 jobs during the 1990s. Large absolute and relative gains occurred in the services (373 jobs; 61 percent) and construction (117 jobs; 71 percent) sectors, with the agricultural services, forestry, fishing, and other sector also experiencing a relatively large increase (117 jobs; 121 percent) over this period (Oregon Employment Department, 2001b; U.S. Bureau of Economic Analysis, 2003a).

Baker, Morrow, and Union Counties. Total employment increased by 19 percent in Baker County between 1990 and 2000, with 9,037 full- and part-time jobs identified in the county in 2000. Data for 2001 indicate that the economy of Baker County is relatively specialized in the farm and mining sectors, with the farm sector accounting for 12 percent of total employment in 2001 compared to 3 percent

statewide. The mining sector accounted for 1.2 percent of total employment compared to 0.2 percent statewide (Table 100). Covered employment in the wood products sector in Baker County declined by 112 jobs during the 1990s (Oregon Employment Department, 2001b).

Total employment in Morrow County increased by 26 percent during the 1990s, with 5,233 full- and part-time jobs identified in the county in 2000. Data for 2001 indicate that Morrow County is relatively specialized in the farm, utilities, and manufacturing sectors, with the farm sector accounting for 21 percent of total employment in 2001 compared to 3 percent statewide. The manufacturing sector accounted for 15 percent of total employment compared to 11 percent statewide (Table 100). Although manufacturing accounted for a relatively large share of total employment in 2001, employment in this sector decreased during the 1990s with declines in the lumber and wood products sector. Food products accounted for more than half of covered manufacturing employment in Morrow County in 2000, with lumber and wood products accounting for approximately 15 percent of total covered manufacturing employment (Oregon Employment Department, 2001a).

Total employment in Union County increased by 18 percent during the 1990s, with 15,304 full- and part-time jobs identified in the county in 2000. Data for 2001 indicate that Union County is relatively specialized in the farm and government sectors, with the farm sector accounting for 8 percent of total employment in 2001 compared to 3 percent statewide (Table 100). The government sector accounted for 19 percent of total employment compared to 13 percent statewide (U.S. Bureau of Economic Analysis, 2003a; 2003b). Covered employment in the wood products sector in Union County declined by 369 jobs during the 1990s. Relatively large job losses also occurred in the transportation and public utilities sector (Oregon Employment Department, 2001b).

Potentially Affected Industries

The following provides an overview of the industries (lumber and wood products, recreation and tourism, and agriculture) that could be potentially affected by the Proposed Land Exchange.

Lumber and Wood Products. A total of 81 firms employed 1,610 people in the forestry and logging and wood products manufacturing sectors in the six-county area in 2002 (Table 101). Wood products manufacturing accounted for approximately 84 percent of this total. The 16 wood products manufacturing facilities identified in the six-county area in 2002 were located in Union (7), Umatilla (5), and Grant (4) counties (Oregon Employment Department, 2003b). These three counties, Union, Umatilla, and Grant, accounted for 49 percent (660 jobs), 36 percent (484 jobs), and 16 percent (213 jobs) of total wood products employment in the area, respectively (Table 101).

Table 101. Forest Products Employment, 2002

County	Employment			
	Forestry and Logging	Wood Products Manufacturing	Forest Products Total	Percent of County Total
Baker	47	0	47	0.9
Grant	97	213	310	11.5
Morrow	0	0	0	0
Umatilla	52	484	536	1.8
Union	0	660	660	6.9
Wallowa	57	0	57	2.4
Total	253	1,357	1,610	3.1

1) These data compiled by the Oregon Employment Department are a count of workers on the payrolls of business, nonprofit, and government establishments. These data are by place of employment and represent a head county of both full-time and part-time workers, with each job that a person holds counted at full weight. Self-employed workers are not included in these totals.
2) These totals have the potential to both over count and under count employment in the forestry and logging sector where employment is often seasonal or part-time and workers are often self-employed.
3) These data are reported using the North American Industry Classification System (NAICS), which was introduced in 2001. Prior to 2001, Federal and state agencies used the Standard Industrial Classification (SIC) system for payroll, earnings, and employment reporting.
Source: Oregon Employment Department, 2003b.

Direct employment in the forestry and logging and wood products manufacturing sectors accounted for approximately 3.1 percent of total non-farm covered employment in the six-county area in 2002, ranging from 0 in Morrow County to 11.5 percent of total employment in Grant County (Table 101). Employment in the lumber and wood products sector is relatively well paid. The average annual salaries for the forestry and logging and wood products manufacturing sectors in the six-county area were $27,747 and $33,221 in 2002, respectively, compared to an average area salary of $26,956 (Oregon Employment Department, 2003b).

Covered employment in the lumber and wood products sector in the six-county area declined from 3,771 to 2,501 jobs between 1990 and 2000, a loss of 1,270 jobs or 34 percent. Absolute job loss by county ranged from 112 jobs (24 percent) in Baker County to 369 jobs (29 percent) in Union County, with large relative losses occurring in Morrow (84 percent) and Wallowa (61 percent) counties (see Figure 4) (Oregon Employment Department, 2003c).

Timber harvest levels in the six-county area have shown an overall pattern of decline since 1990 (Figure 5). Harvest levels ranged from a peak of 690 million board feet (MMBF) in 1990 to a low of 198 MMBF in 2003. Harvest in the analysis area occurs mainly on private and Federal lands. Much of the decline over the past decade has occurred on Federal lands, with harvest levels decreasing from 447 MMBF in 1990 to 29 MMBF in 2003 (Figure 5). Grant County experienced the largest absolute decrease in harvest over this period, with total harvest from all ownerships decreasing from 263 MMBF in 1990 to 37 MMBF in 2003. Total harvest in 2003 ranged from 14 MMBF in Morrow County to 67 MMBF in Wallowa County. The majority of the harvest occurred on private lands (Figure 6).

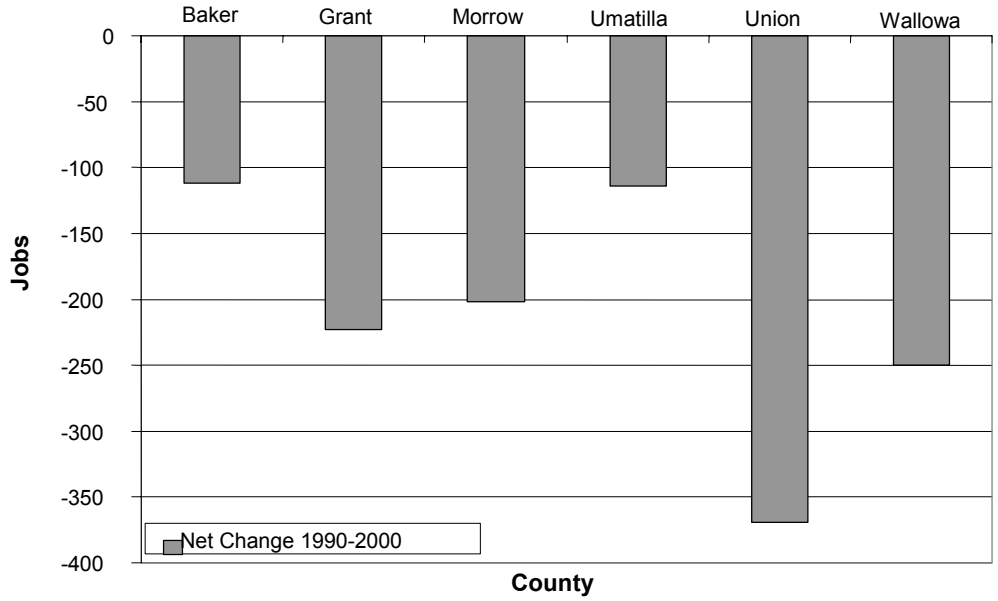
Recreation and Tourism. This sector plays an important role in the economies of Wallowa, Baker, and Grant counties (Table 102). Recreation and tourism is not classified or measured as a standard industrial category and, therefore, employment and income data are not specifically collected for this sector. Components of recreation and tourism activities are instead captured in other industrial sectors, primarily the retail sales and services sectors. Estimates of travel impacts developed for the Oregon Tourism Division indicated that travel-related expenditures supported approximately 4,060 jobs in the six-county area in 2002, representing approximately 5.2 percent of total employment in the area compared to 4.3

percent statewide (Table 102). Travel-related employment ranged from 3.3 percent of total employment in Morrow County to 12.1 percent in Wallowa County.

Employment in the recreation and tourism sector generally tends to be seasonal and relatively low paid, with a high proportion of the labor force self-employed. The study prepared for the Oregon Tourism Division indicated that the average annual salary for this sector in the six-county area in 2002 was $13,916 compared to an area average salary of $26,956 for all sectors (Dean Runyon Associates, 2004; Oregon Employment Department, 2003b).

Agriculture. Agriculture is the primary land use in the six-county area, with farmlands comprising 49 percent of the area. The 1997 Census of Agriculture identified 4,310 farms in the area, with an average farm size of 1,324 acres that varied by county, ranging from 639 acres in Union County to 2,655 acres in Grant County (Table 103). The overall market value of agricultural products sold in the six-county area in 1997 was about $537 million, with crops and livestock accounting for 67 percent and 33 percent of this total, respectively. The division between crops and livestock did, however, vary by county, with livestock comprising the majority of agricultural products sold in Grant (85 percent), Baker (75 percent), and Wallowa (64 percent) counties. Cattle and calves were the main livestock produced in the area (Table 103).

Figure 5. Net Change in Lumber and Wood Products Employment, 1990 to 2000

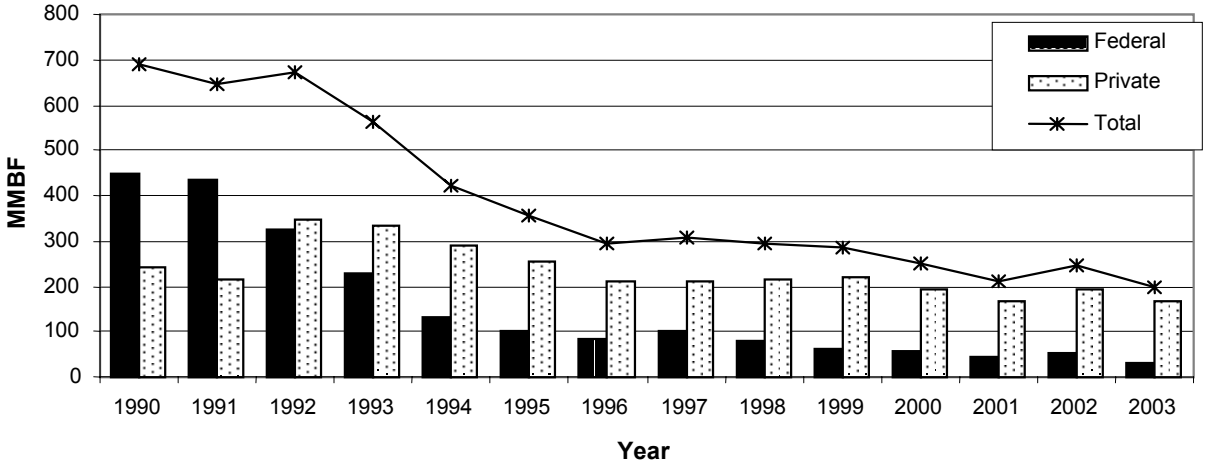


1) Data are covered employment totals for SIC 24 – Lumber and wood products. This group includes establishments engaged in cutting timber and pulpwood; merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, plywood mills, and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in manufacturing finished articles made entirely or mainly of wood or related materials

2) These data are for SIC 24 and not directly comparable to those in Table 101 (see Table 101, note 3). Employment formerly reported for SIC 24 is distributed over 5 separate NAICS codes including wood product manufacturing and forestry and logging (Table 101), as well as furniture and related product manufacturing, miscellaneous manufacturing, and machinery manufacturing.

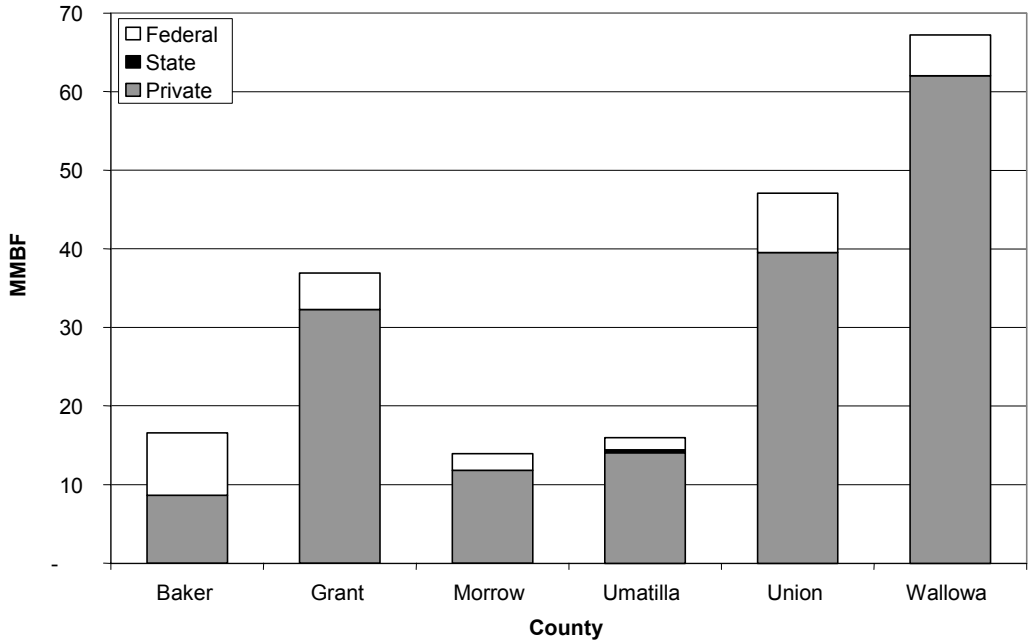
Source: Oregon Employment Department, 2003c.

Figure 6. Northeast Oregon Total Timber Harvests by Ownership, 1990-2003



1) The data is for Baker, Grant, Morrow, Umatilla, Union, and Wallowa counties.
2) Harvest from State lands ranged from 0 to just over 1 MMBF over this period.
Source: ODF, 2003/2004

Figure 7. Timber Harvest by County, 2003



Source: ODF, 2004.

Table 102. Travel Related Economic Impacts, 2002

County	Travel-Related Employment[1/]	Percent of Total Employment[2/]	Local Tax Revenue ($million)[3/]
Baker	810	9.1	0.2
Grant	270	6.1	0
Morrow	190	3.3	0
Umatilla	1,710	4.4	0.7
Union	530	3.5	0.3
Wallowa	550	12.1	0.2
Total	4,060	5.2	1.4
Oregon	90,160	4.3	73.0

1) This table presents estimates of employment, average annual income, and local tax revenues generated by travel-related expenditures on accommodation, food and beverages, local transportation, recreation and entertainment, and shopping. These totals include estimates of spending by U.S. residents and foreign visitors, as well as Oregon residents traveling from other counties, provided those trips are not work commutes or other routine travel.
2) The percent of total employment estimates were generated by Dean Runyon Associates based on estimates of total employment calculated from Bureau of Economic Analysis 2001 estimates of total employment and Bureau of Labor Statistics 2002 estimates for covered employment.
3) Local taxes, as shown here, consist of local room taxes, or transient lodging taxes, and local sales and use taxes applicable to traveler purchases in eating and drinking establishments, in retail stores, and on automobile rentals. These totals do not include state sales taxes applied to traveler spending on accommodations, retail shopping, restaurant meals, entertainment, and automobile rentals or the state fuel tax levied on motor fuel purchases.
Source: Dean Runyan Associates, 2004.

Dependence on forage from Federal lands varies based on a variety of factors, including season of use, availability of Federal and private forage, and the number of Federal permits available. Estimates of dependence on forage from Federal lands in the six-county study area range from 2 percent of the total in Umatilla County to 17 percent in Wallowa County (Table 103).

Farms in the six-county area provided about 8,000 jobs in 2001, approximately 10 percent of total employment. Agricultural employment was relatively important in Morrow, Wallowa, and Grant counties, accounting for approximately 21 percent, 16 percent, and 13 percent of total employment in 2001 (Table 104).

Table 103. Summary of Agriculture by County, 1997

	Baker	Grant	Morrow	Umatilla	Union	Wallowa	Total
Number of Farms	704	407	420	1,488	832	459	4,310
Land in Farms (acres)	1,007,737	1,080,756	1,118,226	1,345,097	531,990	620,886	5,704,692
Percent of Total County Area	51	37	85	65	41	31	49
Average Farm Size (acres)	1,431	2,655	2,662	904	639	1,353	1,324
Total Market Value of Agricultural Products Sold ($000)	53,876	17,093	141,531	249,201	47,731	27,436	536,868
Crops (% of total market value)	25	14	77	76	71	36	67
Livestock, poultry, and their products (% of total market value)	75	86	23	24	29	64	33
Cattle and Calves (% of total market value)	68	84	22	21	26	62	31
Dependence on Federal Forage (%)	8	15	3	2	5	17	na

1) All data are from the 1997 Census of Agriculture and are for 1997, with the exception of the Dependence on Federal Forage, which was estimated based on allotment data for 1993 and data from the 1982, 1987, and 1992 agricultural census (Frewing-Runyon, 1995).
Source: Frewing-Runyon, 1995; U.S. Department of Agriculture, 1999.

Table 104. Agricultural Employment by County, 2001

County	Baker	Grant	Morrow	Umatilla	Union	Wallowa	Total
Farm Employment	1,112	588	1,124	3,280	1,195	694	7,993
Percent of Total Employment	12	13	21	9	8	16	10

1) These data include covered and self-employed farm workers.
Source: U.S. Bureau of Economic Analysis, 2003b.

Government Taxes and Revenues

State and local governments in Oregon receive revenues from both privately owned and Federal lands through several types of payment mechanisms. These are the Federal 25 Percent Fund, Federal Payments In-Lieu of Taxes (PILT), and property taxes paid on private lands. These sources of revenue are discussed below. The Oregon Forest Products Harvest Tax is also addressed.

Federal 25 Percent Fund

In previous years, a portion of the returns to the U.S. Treasury from revenue producing FS activities, such as timber sales, were returned to each state containing national forestlands for distribution back to counties having acreage within a national forest. These revenue distributions, referred to as Federal 25 Percent Fund payments, were dedicated to schools and roads. Payments for Fiscal Years 1998 to 2000 are presented by county in Table 105.

In October 2000, the Secure Rural Schools and Community Self-Determination Act of 2000 was enacted to stabilize 25 percent fund payments to states for schools and roads. Under the new legislation, counties

can elect for fiscal years 2001 through 2006 to take a full payment approach that is not linked to annual FS revenues. Full payment is based on the average of the highest three payments made to the state between 1986 and 1999. The full payment amounts are presented for each county in Table 105. All six counties elected to take full payment. Projected changes in NFS land under the action alternatives would, therefore, have no effect on amount of Federal 25 Percent Fund payments that the affected counties receive, at least through 2006.

Table 105. Federal 25 Percent Fund Payments

County	1998	1999	2000	Full Payment
Baker	373,800	229,600	240,973	1,197,000
Grant	1,438,300	1,034,100	380,293	9,549,300
Morrow	68,300	98,300	42,841	351,700
Umatilla	192,900	266,200	122,239	959,600
Union	323,700	238,800	226,741	980,000
Wallowa	536,600	446,600	392,763	1,308,400

Source: FS, 2004a.

Federal Payments In-Lieu of Taxes (PILT)

PILT payments are Federal payments to local governments that help counties offset losses in property taxes associated with nontaxable Federal land located within a county's boundary. PILT payments are distributed by the BLM and are made for tax-exempt Federal land administered by the BLM, the FS, the National Park Service, U.S. Fish and Wildlife Service, and for Federal water projects and some military installations.

These payments are designed to supplement other Federal land receipt-sharing payments that local governments may receive, including timber receipts from national forests, grazing fee receipts, mineral material sales receipts, and some receipts collected on wildlife refuges. PILT payments traditionally helped balance the uneven distribution of Federal 25 Percent Fund payments between counties with NFS land and counties with other types of Federal land that do not generate timber revenues. PILT has historically been a more stable and dependable revenue source than Federal 25 Percent Fund payments because it is a flat per-acre payment that is not tied to levels of revenue generated by NFS land. There are two formulas that may be used to calculate PILT payments, with authorized payments based on the highest resulting value.

Annual PILT payments are presented by county for 1999 to 2003 in Table 106. Annual payments fluctuate from year to year as the total number of entitlement acres in a county changes and the method of calculating payments switches between the two formulas.

Table 106. Annual PILT Payments by County, 1999 to 2003 ($)

County/Fiscal Year	1999	2000	2001	2002	2003
Baker	305,556	377,545	642,721	675,881	326,877
Grant	174,267	185,980	269,604	347,883	319,996
Morrow	36,324	95,999	124,802	158,929	27,268
Umatilla	98,712	265,205	349,428	440,521	119,409
Union	290,262	388,683	597,937	640,353	389,426
Wallowa	139,329	153,028	265,783	313,148	212,372

1) For 2003, some counties will receive slightly reduced PILT payments to adjust for increased revenue received during the previous fiscal year under the Secure Rural Schools and Community Self-Determination Act. Changes in PILT payments can also occur based on the amount that Congress appropriates for the program in a given fiscal year.
Sources: BLM, 2004; National Association of Counties, 2004.

Oregon Property Tax

Property tax revenues are one of the most important sources of revenue for the public sector in Oregon (Oregon Department of Revenue, 2004a). Property taxes imposed for fiscal year (FY) 2003-04 are presented by county in Table 107. This table also presents total real market value, net assessed value, and average tax rates by county. Total property taxes imposed ranged from approximately $5.3 million in Grant County to approximately $53.7 million in Umatilla County. Average tax rates, based on assessed value, range from $13.34 per $1,000 in assessed value for Wallowa County to $17.05 per $1,000 in assessed value in Morrow County (Table 107).

Table 107. Oregon Property Tax by County, Fiscal Year 2003-04

	FY 2003-04 ($000s)			Average Tax Rate ($/$1000)	
County	Real Market Value (RMV)	Net Assessed Value (NAV)	Property Tax Imposed	NAV Base	RMV Base
Baker	1,071,147	914,269	12,339	13.50	11.52
Grant	429,167	344,000	5,332	15.50	12.42
Morrow	1,157,353	1,007,518	17,175	17.05	14.84
Umatilla	4,165,958	3,373,716	53,727	15.93	12.9
Union	1,354,602	1,089,045	14,740	13.53	10.88
Wallowa	619,759	481,092	6,418	13.34	10.36

FY = Fiscal Year
1) Tax rates are applied to net assessed values.
2) Property subject to taxation includes all privately owned real property (land, buildings, and improvements) and business personal property (machinery, office furniture, and equipment). Forestland and farm and range property are included in this definition.
Source: Oregon Department of Revenue, 2004a

Oregon Forest Products Harvest Tax- The Oregon Forest Products Harvest Tax is paid on timber cut from all land in Oregon. Tax is paid annually to the Department of Revenue by January 31 for harvested timber that is measured between January 1 and December 31 of the prior calendar year. The tax, which is based on volume harvested, does not apply to the first 25 MBF harvested each calendar year. This tax rate can change annually due to balances in the emergency fire fighting fund and the needs of other programs. The rate ($3.07 per MBF in 2003; $2.95 per MBF in 2004) is reviewed each legislative season (Oregon Department of Revenue, 2003).

Forest Products Harvest Tax data are presented by analysis Area County for 1997 through 2002 in Table 108. The revenue from this tax is used to help support the ODF provide emergency fire fighting funds for

lands protected by the state of Oregon and administer the Forest Practices Act on private land. It also provides funds for operations of the Oregon Forest Resources Institute.

Table 108. Oregon Forest Products Harvest Tax Revenues, 1999 to 2002 ($)

	Baker	Grant	Morrow	Umatilla	Union	Wallowa
1999	67,120	209,382	47,813	87,041	127,706	213,479
2000	70,901	159,599	34,650	53,330	198,555	184,845
2001	42,766	140,953	12,603	88,044	127,721	134,366
2002	74,192	166,595	24,363	137,304	137,352	170,240

1) Harvest data used to estimate tax revenues for 2002 are from the ODF 2002 Annual Report. All other years are from the Oregon Department of Revenue (2003).
2) Estimated tax revenues were calculated by multiplying the Forest Products Harvest Tax Volume in MBF by annual rates published by the Oregon Department of Revenue (2003).
Sources: Oregon Department of Revenue, 2003; ODF, 2003.

Land Management Administrative Costs

Public land managers perform a variety of ongoing administrative functions. FS operating units are typically organized according to the standard administrative functions involved in managing public land for multiple uses. These functions include engineering (primarily road system planning, construction, and maintenance), land and minerals management, recreation management, land management planning, timber and range management, watershed management, wildlife and fisheries management, and fire management. Privately owned land typically has less management emphasis on multiple use and a more simplified management structure. Fragmented ownership patterns create a number of complexities or difficulties in conducting land management activities on NFS lands. Some management difficulties result in costs that can be quantified. Other impacts on management are less tangible and more difficult to quantify, but nevertheless real.

The following discusses FS management requirements and costs associated with fragmented ownership patterns. This discussion specifically addresses property boundaries, roads, and access. Other management costs that could be potentially affected by the action alternatives include noxious weed treatment, fire management costs, special use authorizations, and management of facilities, mine portals, and acquired lands.

Property Boundaries
The FS is required by law to post, survey, and maintain all exterior boundaries of NFS land. Total FS boundary length is greater in areas with fragmented ownership patterns than in comparable sized areas with consolidated ownership. The Federal exchange parcels include existing unmarked boundaries that would need to be surveyed and marked under the No Action Alternative.

Roads
Fragmented land ownership patterns can affect the density of roads constructed in a given area and thereby affect the cost of road construction and maintenance. The FS needs more miles of road to serve fragmented land than the same acreage in a consolidated pattern. In addition, different landowners have varying preferences for road construction and logging systems. Road-related administrative costs include deferred maintenance and annual maintenance costs. Deferred maintenance costs are one-time investments required to mitigate existing road problems.

Access and Compliance
In cases where NFS parcels do not have legal access, it is FS policy to acquire permanent exclusive easements to allow full use of these lands. The Federal exchange lands include a number of parcels that do not currently have legal access.

In addition, by law, private property owners are guaranteed access across NFS land to their private property. Timber companies, for example, often request easements to cross NFS land to gain access to other parcels, typically for timber harvesting. In cases where the FS does not need the road, the private party must pay all of the road maintenance costs based on the assigned National Forest road classification.

Granting access requires the administrative processing of an application, negotiating easement agreements, granting and filing easements, approving permits, and compliance with NEPA and other environmental laws and regulations. Processing access requests can be administratively burdensome, costly, and time consuming for the FS.

Environmental Consequences

The following discusses the potential direct and indirect social and economic effects associated with the proposed Blue Mountain Land Exchange alternatives. These effects are primarily evaluated in terms of employment and the economy, traditional uses and lifestyles, government taxes and revenues, and land management administrative costs.

The acres that would be conveyed and/or acquired under each alternative are summarized by county in Chapter 2. There would be no acres conveyed or acquired under Alternative 2 and current land ownership patterns would remain unchanged. Table 109 shows net change in Federal acres for each county by alternative.

Table 109. Net Change by county in Federal Acres by Alternative

County	Alternative 1 (acres)	Alternative 2 (acres)	Alternative 3 (acres)	Alternative 4 (acres)
Baker	269	0	0	(42)
Grant	3,494	0	59	(4,398)
Morrow	(231)	0	0	(231)
Umatilla	1,091	0	343	(2,349)
Union	(79)	0	47	(100)
Wallowa	9,025	0	3,800	6,067
Total	13,569	0	4,249	(1,053)

Alternative 2 is the No Action Alternative. No lands would be conveyed or acquired under this alternative.

Alternative 1: Proposed Exchange

The lands proposed for exchange under this alternative are distributed across Baker, Grant, Morrow, Umatilla, Union, and Wallowa counties, with the majority of the lands involved (approximately 95 percent) located in Grant (28 percent), Umatilla (30 percent), and Wallowa (37 percent) counties. The FS would experience a net gain of 13,569 acres under this alternative, with two-thirds (9,025 acres) of this gain occurring in Wallowa County. There would be a net gain in Federal acres in all counties, with the exception of Morrow and Union counties (Table 109).

Employment and the Economy

The following evaluates the potential effects of Alternative 1 on local employment and income in the lumber and wood products, recreation, and agricultural sectors. These are the main sectors that could be directly affected by the Proposed Land Exchange.

Lumber and Wood Products- Alternative 1 would result in a net loss of private acres, but would likely result in an increase in the supply of timber available for harvest. The conveyed parcels would include approximately 82.9 MMBF of harvestable timber resources that would be available for harvest under this

alternative (Table 110). This volume, which is equivalent to 42 percent of total harvest in the six-county area in 2003, would not be available for harvest if these lands remain part of the NFS. The available volume would be concentrated in Grant, Umatilla, and Wallowa counties (Table 110), and represents 91 percent of the total volume harvested in Grant County in 2003 and almost twice the volume harvested in Umatilla County (PR).

The acquired parcels under this alternative include approximately 46.1 MMBF of harvestable timber presently available for harvest (Table 110). This volume would no longer be available for harvest if these lands were acquired.

The net increase in volume under this alternative would, therefore, be 36.8 MMBF (82.9 MMBF – 46.1 MMBF). The majority of this increase would occur in Grant and Umatilla counties and the net increase would be equivalent to approximately 58 percent and 78 percent of total harvest in these counties in 2003, respectively.

Assuming this volume would be harvested within 10 years and the harvest spread evenly over this period, the net increase in average annual volume would be approximately 3.7 MMBF (Table 110). This net annual increase in harvest would support approximately 33 full-time equivalent (FTE) jobs and approximately $1 million in income each year (Table 111). Assuming that the employment would for the most part take place in the same county that the harvest occurs, the majority of this employment and income would be supported in Grant (19 jobs; $550,000) and Umatilla (11 jobs; $320,000) counties (Table 111).

These employment estimates include direct, indirect, and induced employment. Direct employment would be generated in the logging and sawmill sectors. Additional employment would be generated as the directly affected logging and sawmill operations purchase services and materials as inputs (“indirect” effects) and employees spend their earnings within the local economy (“induced” effects). The income estimates also include direct, indirect, and induced effects.

Table 110. Projected Timber Volume by County and Alternative

County	Alternative				Net Change from Alt. 2		
	1	2	3	4	1	3	4
	Total Available Volume by Alternative (MBF)[1]						
Baker	266	0	0	250	266	0	250
Grant	33,433	12,017	12,017	25,536	21,416	0	13,519
Morrow	1,585	0	0	163	1,585	0	163
Umatilla	31,364	18,909	18,806	20,574	12,456	(102)	1,665
Union	420	0	0	-21	420	0	(21)
Wallowa	15,805	15,125	14,847	15,220	680	(278)	95
Total	**82,872**	**46,051**	**45,670**	**61,723**	**36,822**	**(381)**	**15,672**
	Annual Available Volume by Alternative (MBF)[2]						
Baker	27	0	0	25	27	0	25
Grant	3,343	1,202	1,202	2,554	2,142	0	1,352
Morrow	158	0	0	16	158	0	16
Umatilla	3,136	1,891	1,881	2,057	1,246	(10)	167
Union	42	0	0	(2)	42	0	(2)
Wallowa	1,580	1,513	1,485	1,522	68	(28)	9
Total	**8,287**	**4,605**	**4,567**	**6,172**	**3,682**	**(38)**	**1,567**

MBF = Thousand board feet

1) Total available volume represents the total harvestable volume (i.e., stands older than 25 years) that would be available for harvest. These volumes exclude stands within state-mandated stream buffers and were adjusted to account for the volume that would need to be retained for green-up and/or minimum stocking under the Forest Practices Act. Volumes for the Federal lands included in Alternative 4 were also adjusted to account for the deed restrictions that are part of that alternative.

2) Annual available volumes assume that the total available volume would be harvested within 10 years, with the harvest spread evenly over this period.

Source: Atterbury Consultants, 2004; Barber, 2004.

This projected increase in average annual harvest would not be expected to substantially alter current trends in local timber harvest or existing forest-related employment levels. The total net annual increase in timber available for average annual harvest would be equivalent to 2 percent of total harvest in the six study area counties in 2003. The projected net annual increases as a percentage of 2003 harvest levels would range from approximately 0.1 percent for Union and Wallowa counties to 5.8 percent and 7.8 percent for Grant and Umatilla counties, respectively.

These estimates assume that the availability of timber resources would directly affect harvest and associated employment and income. There are, however, a number of other factors that affect harvest rates, including prevailing demand and market price, as well as competition from other lower cost timber producing regions. Further, timber harvested in a particular county may not necessarily be processed in that county. The distribution of processing facilities within the six-county area does, however, suggest that in this case processing would likely primarily take place in Grant and Umatilla counties.

Table 111. Projected Annual Employment and Income by County and Alternative

County	Alternative				Net Change from Alt. 2		
	1	2	3	4	1	3	4
	Estimated Annual Employment (FTE Jobs)[1/]						
Baker	0	0	0	0	0	0	0
Grant	30	11	11	23	19	0	12
Morrow	1	0	0	0	1	0	0
Umatilla	28	17	17	19	11	0	2
Union	0	0	0	0	0	0	0
Wallowa	14	14	13	14	1	0	0
Total	75	42	41	56	33	0	14
	Estimated Annual Income ($000s)[2/]						
Baker	7	0	0	6	7	0	6
Grant	859	309	309	656	550	0	347
Morrow	41	0	0	4	41	0	4
Umatilla	806	486	483	529	320	-3	43
Union	11	0	0	(1)	11	0	-1
Wallowa	406	389	381	391	17	-7	2
Total	2,129	1,183	1,173	1,586	946	-10	403

FTE Jobs = Full-time equivalent jobs
1) FTE jobs were calculated based on job/MMBF coefficients developed by the FS for the HCNRA CMP Final EIS (Kohrman, 2004a). These coefficients include direct, indirect, and induced employment. FTE jobs are calculated based on the volumes in Table 110.
2) Total income was calculated based on income/MMBF coefficients developed by the FS for the HCNRA CMP Final EIS (Kohrman, 2004a). These coefficients include direct, indirect, and induced income. Income is calculated based on the volumes in Table 110.

Recreation and Tourism- Under Alternative 1, there would be no immediate change in access to the parcels that would be acquired. Private parcels that currently have access restrictions would continue to have the same restrictions under Federal management. Access to the acquired parcels would be addressed through future planning efforts.

There would, however, be some immediate changes in access to the Federal parcels conveyed, with verbal, written, or gate access likely to be required in some cases. These restrictions would affect recreationists, especially campers and those driving for pleasure, who would otherwise use these areas. This could result in increased competition for camping areas that remain in public ownership in some locations (FS, 2004c).

Although there would be no change in access to the parcels acquired in the short-term, these areas would ultimately provide much needed fishing access to the Imnaha River and improve trail user satisfaction in the Hells Canyon and Eagle Cap wildernesses, among other things (FS, 2004c). These developments could result in increased recreation use in the future relative to Alternative 2 and could, in turn, have positive employment and income effects. It is not, however, possible to quantify this potential increase in use or the amount of this potential increase that would represent new recreation use in the area.

Agriculture- Grazing on NFS lands is authorized through grazing permits on established grazing allotments. Allotments are designated on NFS lands and other lands offered with the owners consent to form logical grazing management units. In addition to grazing on NFS lands and private lands that are located within established grazing allotments, there are private exchange parcels within the project area that are grazed independent of FS allotments.

Under Alternative 1, the FS would acquire 141 parcels (24,306 acres) within existing allotments and convey 62 parcels (15,450 acres) within allotments for a net gain of 8,856 acres. Although the acquired

parcels would add capacity to the affected allotments, there would be no increase in stocking until further analysis is conducted. The FS would, however, cancel five existing grazing permits, which would result in a reduction of permitted stocking by 723 Animal Unit Months (AUMs). The parties receiving the conveyed lands have, however, expressed interest in continuing to graze these lands with two exceptions. These two exceptions combined currently account for 106 permitted AUMs (FS, 2004k). This projected change is not expected to have a measurable effect on local employment or income.

The FS would also acquire 2,517 acres outside allotments that are presently being grazed and convey 1,133 acres outside allotments that the parties receiving the lands have expressed an interest in grazing. Grazing would be discontinued on the parcels that would be acquired (FS, 2004k). The associated net change in AUMs is unknown, but it is not expected to have a measurable effect on local employment or income.

Traditional Uses and Lifestyle

Hells Canyon National Recreation Area- Under alternative 1, the FS would acquire 8,199 acres of non-Federal lands located within the HCNRA and convey 695 acres of Federal lands in the HCNRA. This would represent a net gain of 7,504 acres within the HCNRA boundary from the FS's perspective and a net decrease in privately owned lands of the same amount. This net decrease would represent approximately 23 percent of the existing private lands in the HCNRA. This reduction in private lands would represent a foregone opportunity to continue a ranching lifestyle on those properties. This reduction may be considered detrimental by local residents and communities who are concerned with preserving traditional uses and lifestyles in the area and may already feel that their way of life is being negatively affected by other factors. Other factors affecting traditional uses and lifestyles in and around the HCNRA include changes in Federal land management polices, reductions in timber harvest from area national forests, and developments on surrounding private lands that are not consistent with the existing landscape character. As people have become aware of the attractions and amenities associated with the HCNRA, a number have purchased property and moved to the area or developed recreation or seasonal homes, with 1 in 8 homes in Wallowa County used only for seasonal, recreational, or occasional purposes in 2000 (FS, 2004c; U.S. Census Bureau, 2000). New residential developments include log and other relatively large homes that are inconsistent with the existing pastoral landscape, traditionally dominated by working ranches and associated structures (Kohrman, 2004b).

The transfer of these private HCNRA exchange lands to the FS would also affect ownership patterns along the Imnaha River corridor. Much of the private land within the Wallowa County portion of the HCNRA is focused along this corridor, with private inholdings extending some distance upstream from the town of Imnaha and generally extending north from the HCNRA boundary to the confluence of the Imnaha and Snake rivers. The parcels that would be acquired would affect the overall connectivity of these private corridors. Under this alternative, some private parcels that are adjacent to the non-Federal exchange parcels would be surrounded by Federal lands on all sides following the acquisition, which could affect existing working relationships.

Although there would be no change in access in the short-term, the parcels in the HCNRA acquired would ultimately provide fishing access to the Imnaha River and improve trail user satisfaction in these areas (FS, 2004c). This change in access and improvements in trail user satisfaction could result in increased recreation use in these areas in the future, which could be perceived as negative by long-term residents of the adjacent private lands. Increased recreational access could affect existing working relationships and could also result in an increase in trespassing on the remaining adjacent private lands.

Government Taxes and Revenues

Overview- Alternative 1 would result in a net reduction in private lands subject to property taxes. This net reduction would result in a small decrease in local property tax revenues that would be partially offset by

an increase in PILT payments, which are intended to help offset losses in property taxes associated with nontaxable Federal land. Estimates developed for this analysis indicate that this alternative would result in an overall net reduction in annual property tax revenue of approximately $5,000 for the six counties as a whole, with the majority of this reduction occurring in Wallowa County ($3,000). These reductions are equivalent to less than 0.1 percent of total property taxes imposed in FY 2003-04 for the six-county area and Wallowa County, respectively (see Table 107).

Federal 25 Percent Fund- There would be no change in Federal 25 Percent Fund payments under this alternative. All six study area counties elected to take the full payment approach under the Secure Rural Schools and Community Self-Determination Act of 2000. As a result, Federal 25 Percent Fund payments to these counties are fixed through 2006 and are not tied to revenue produced from FS activities.

Federal Payments in Lieu of Taxes- Alternative 1 would have a minimal effect on Federal PILT payments to the six study area counties. PILT payments in the study area in 2003 ranged from $27,268 in Morrow County to $389,426 in Union County (see Table 106). NFS land accounted for over 90 percent of total entitlement lands in all of the study area counties, with the exception of Baker County, where NFS lands comprised 64 percent of total entitlement acres. The net gain in NFS acres under this alternative (13,569 acres) represents 0.26 percent of the total entitlement acres in the six-county study area in 2003, ranging from 0.03 percent of the total in Baker County to 0.77 percent in Wallowa County. Based on 2003 payment levels, this net increase in acres would result in a total increase in annual PILT payments of approximately $2,600 to the six-county study area.

Oregon Property Tax- Potential changes in property tax revenues were estimated for each county based on 2004 property tax rates and actual 2004 assessed values for the private exchange parcels. Assessed values were estimated for the Federal exchange parcels based on the average assessed value per acre for private exchange parcels in the same tax code classification. In cases where there were no private exchange parcels in the same code, the average assessed value per acre for the private parcels in that county was used.

This analysis indicates that Alternative 1 would result in an overall net reduction in property tax revenue of approximately $5,000 for the six counties as a whole, with the majority of this reduction occurring in Wallowa County ($3,000) (Table 112).

Table 112. Estimated Property Tax Revenues by Alternative and County

	Alternative 1		Alternative 3		Alternative 4	
	$000s[1/]					
County	Conveyed	Acquired	Conveyed	Acquired	Conveyed	Acquired
Baker	0.0	0.2	0.0	0.0	0.0	0.0
Grant	4.2	5.0	0.0	0.0	4.2	1.2
Morrow	0.0	0.1	0.0	0.0	0.0	0.1
Umatilla	1.5	2.4	0.0	0.1	1.5	1.7
Union	0.4	0.5	0.0	0.2	0.4	0.3
Wallowa	3.1	6.3	0.0	1.4	3.1	5.1
Total	9.2	14.4	0.0	1.7	9.2	8.4

Net Change by Alternative ($000s)[1/]				
	1	2	3	4
Baker	(0.2)	0.0	0.0	0.0
Grant	(0.7)	0.0	(0.0)	3.0
Morrow	(0.1)	0.0	0.0	(0.1)
Umatilla	(0.9)	0.0	(0.1)	(0.2)
Union	(0.1)	0.0	(0.2)	0.1
Wallowa	(3.2)	0.0	(1.4)	(2.0)
Total	(5.2)	0.0	(1.7)	0.8

1) Numbers are rounded to the closest 1,000 to reflect the level of accuracy of this analysis, which is primarily intended for the comparison of alternatives

Oregon Forest Products Harvest Tax- Based on the projected annual available volumes shown in Table 110 and assuming for the purposes of analysis that the applicable tax rate would be $3.27 per MBF, Alternative 1 would result in a net annual increase of approximately $12,000 in this tax.

Land Management Administrative Costs

Overview- Alternative 1 would potentially affect projected land management administrative costs for the three participating National Forests. There would be one-time costs and savings, as well as changes in annual maintenance costs. One-time costs and savings are summarized by alternative in Table 113. There would be an estimated one-time saving of approximately $1.4 million under this alternative. The majority of these savings would be due to property boundary surveys and easement acquisitions that would no longer be necessary under Alternative 1.

Table 113. One-Time Administrative Costs and Savings by Alternative[1/]

	Alternative 1 $	Alternative 3 $	Alternative 4 $
Property Boundary Administration[2]	-1,163,000	-265,000	-332,000
Boundary Disputes	46,000	0	46,000
Deferred Road Maintenance[3]	114,000	2,400	39,253
Mine Portal Closure	5,000	2,500	5,000
Facility Acquisition	20,000	10,000	10,000
Special Use Permit Administration	-18,500	0	-18,500
Easement Acquisition	-440,000	-20,000	-360,000
Private Land Purchase	0	245,000	0
Total	**-1,436,500**	**-25,100**	**-610,247**

1) A positive change represents an increase in FS costs and a negative change represents a reduction in FS costs.
2) Property boundary administration includes new boundary survey and marking costs, boundary line removal costs, existing boundary survey and marking savings, and existing boundary maintenance savings (see Table 115).
3) The costs summarized here are the midpoint of the estimated range of potential costs (see Table 116).

Annual maintenance cost changes are summarized in Table 114. There would be a net increase in annual administrative costs of approximately $115,000 under Alternative 1. The majority of these costs would be incurred for noxious weed management on the lands that would be acquired under this alternative. These management costs would likely decrease over time because active management would reduce the number of acres occupied by weeds.

Table 114. Annual Administrative Costs and Savings by Alternative[1]

	Alternative 1 $	Alternative 3 $	Alternative 4 $
Road Maintenance [2]	7,891	442	(482)
Noxious Weed Management	107,000	36,750	100,500
Deed Restriction Monitoring	0	0	30,550
Total	**114,891**	**37,192**	**130,568**

1) A positive change represents an increase and a negative change represents a reduction in cost to the Forest Service
2) Road maintenance costs and savings are the difference between the miles and costs on the acquired and conveyed lands (see Table 117).

There are also several types of potential costs and savings that cannot be quantified. These include changes in fire management costs and potential reductions in requests for access across NFS lands.

The following discusses projected administrative costs in more detail by affected resource.

Property Boundaries- Alternative 1 would result in property boundary-related costs and savings. Costs would be associated with surveying and marking new boundaries and removing existing marked boundaries. Savings would be associated with existing unmarked boundaries that would no longer need to be surveyed and marked, and maintenance for existing marked boundaries that would no longer be necessary.

Total additional property boundary costs under Alternative 1 would be approximately $923,000, with the majority of this cost ($753,000) associated with surveying and marking the 75 miles of new property boundary that would result under this alternative. Approximately 50 percent of these costs would be incurred on the Wallowa-Whitman National Forest where approximately 42 miles of new property boundary would need to be surveyed and marked (Table 115).

Table 115. Estimated Property Boundary Costs and Savings by Alternative

Forest	Alternative 1		Alternative 3		Alternative 4	
	Miles	$000s	Miles	$000s	Miles	$000s
New Boundary Survey and Marking ($10,000/mile)						
Malheur	7.75	78	0	-	7.25	73
Umatilla	25.81	258	1.5	15	20.76	208
Wallowa-Whitman	41.76	418	9.29	93	40	400
Total	75.32	753	10.79	108	68.01	680
Boundary Line Removal Costs ($650/mile)[1]						
Malheur	89.25	58	0	-	0.00	0
Umatilla	111.85	73	2.5	2	21.10	14
Wallowa-Whitman	59.71	39	9.75	6	31.25	20
Total	260.81	170	12.25	8	52.35	34
Existing Boundary Survey and Marking ($10,000/mile)[2]						
Malheur	0	-	0	-	0.00	0
Umatilla	33.86	(339)	2	(20)	9.10	(91)
Wallowa-Whitman	122.57	(1,226)	33.67	(337)	85.02	(850)
Total	156.43	(1,564)	35.67	(357)	94.12	(941)
Existing Boundary Maintenance ($2,000/mile)[3]						
Malheur	89.25	(179)	0	-	0.00	0
Umatilla	111.85	(224)	2.5	(5)	21.10	(42)
Wallowa-Whitman	59.71	(119)	9.75	(20)	31.25	(63)
Total	260.81	(522)	12.25	(25)	52.35	(105)
Net Change in Property Boundary Costs[4/]						
Malheur		(43)		-		73
Umatilla		(231)		(8)		88
Wallowa-Whitman		(889)		(257)		(492)
Total		(1,163)		(265)		(332)

1) These costs are associated with removing existing marked boundaries. There are no removal costs associated with existing unmarked boundaries that would no longer exist.
2) These savings are for existing unmarked boundaries that would need to be marked at some point in the future.
3) These costs are for maintenance of existing boundaries that would be eliminated under the identified alternative. These types of costs would be incurred only once over the 10-year planning period for this assessment.
4) Net change is the difference between the costs and savings that would occur under each action alternative. A negative net change represents a net reduction in cost to the FS.

Property boundary savings under this alternative would be approximately $1.2 million. Approximately $1.6 million of these savings would result from 156 miles of existing unmarked boundaries that would no longer need surveys (Table 115). The remaining $522,000 of these savings would result from existing marked property boundaries that would no longer need to be maintained. Approximately 64 percent of these total savings would occur on the Wallowa-Whitman National Forest where 123 miles of existing unmarked boundaries would no longer need to be surveyed and marked.

Combined, the estimated property boundary costs and savings associated with Alternative 1 would result in a net cost-saving of approximately $1.2 million (Table 115). This would be a total one time cost-saving over the 10-year planning period used for this analysis.

In addition to the costs of marking and maintaining National Forest boundaries, the FS also incurs costs associated with property boundary disputes, primarily encroachments/trespass by adjacent landowners. It is possible that the number of these disputes and the associated costs would be reduced under Alternative

1 because there would be a decrease in the number of isolated parcels owned by the FS, as well as a decrease in privately-owned in-holdings surrounded by NFS lands. The FS has identified potential encroachment-related costs of approximately $46,000 that would be saved under Alternative 1 (Table 113).

Roads- The Proposed Land Exchange would affect road-related deferred maintenance and annual maintenance costs. Deferred maintenance costs are one-time investments required to mitigate existing road problems. Deferred road maintenance activities related to public safety, protection of cultural resources or threatened and endangered species, or the provision of functional drainage would most likely be implemented within one year following the exchange. Other deferred road maintenance would be implemented within 10 years following the land exchange. Annual maintenance costs are the annual costs of maintaining the roads to standard at their current maintenance level.

Under Alternative 1, the FS would acquire 101 miles of roads and convey 59.6 miles for a net gain of 41.4 miles of road (Table 116). The Malheur National Forest would experience a net reduction in road miles (-17.1 miles) while the Umatilla and Wallowa-Whitman would both experience net gains (26.9 miles and 31.6 miles, respectively). Overall, the FS would experience a net increase in one-time, deferred maintenance costs that would range from about $64,000 to $164,000 (Table 116).

Table 116. Road Miles and Deferred Maintenance Costs by Alternative

Forest	Alternative 1		Alternative 3		Alternative 4	
	Miles	Cost ($)[1]	Miles	Cost ($)[1]	Miles	Cost ($)[1]
Acquired						
Malheur	18.5	$19,000 to $39,000	0	$0	0	$0
Umatilla	47.1	$29,000 to $59,000	3.0	$0	27.4	$9,000 to $18,000
Wallowa-Whitman	35.4	$50,000 to $100,000	5.5	$2,400	25.6	$40,000 to $80,000
Total	101.0	$98,000 to $198,000	8.4	$2,400	53.0	$49,000 to $98,000
Conveyed						
Malheur	35.6	$19,537	0	$0	35.6	$19,537
Umatilla	20.1	$11,150	0	$0	20.1	$11,150
Wallowa-Whitman	3.8	$3,560	0	$0	3.8	$3,560
Total	59.6	$34,247	0	$0	59.6	$34,247
Net Change[2/]						
Malheur	-17.1	-$537 to $19,463	0	$0	-35.6	-$19,537
Umatilla	26.9	$17,850 to $47,850	3.0	$0	7.2	-$2,150 to $6,850
Wallowa-Whitman	31.6	$46,440 to $96,440	5.5	$2,400	21.8	$36,440 to $76,440
Total	41.4	$63,753 to $163,753	8.4	$2,400	-6.6	$14,753 to $63,753

1) Deferred costs for acquired lands are given in terms of a range of values because limited information is available for the roads on these parcels.
2) Net change is the difference between the miles and costs on the acquired and conveyed lands. A positive net change indicates an increase in annual maintenance costs to the Forest Service.
Source: FS, 2004d

Annual maintenance costs would increase by approximately $8,000 under this alternative. These costs would decrease slightly on the Malheur National Forest (-$700) and increase on the Umatilla and Wallowa-Whitman ($4,200 and $4,400, respectively) (Table 117).

The exchange parcels include an additional 66.3 miles of roads that would remain under their existing jurisdiction. The FS would reserve jurisdiction on approximately 10 miles of existing roads on conveyed lands to maintain access to other Forest roads or lands. The rest of these roads (55 miles) are located on parcels that would be acquired.

The Proposed Land Exchange would have no effect on any existing cost share easement agreements (FS, 2003b).

Table 117. Road Miles and Annual Maintenance Costs by Alternative

Forest	Alternative 1		Alternative 3		Alternative 4	
	Miles	Cost ($)[1]	Miles	Cost ($)[1]	Miles	Cost ($)[1]
Acquired						
Malheur	18.5	$2,919	0	$0	0	$0
Umatilla	47.1	$6,329	3.0	$103	27.4	$2,694
Wallowa-Whitman	35.4	$5,274	5.5	$339	25.6	$3,456
Total	101.0	$14,523	8.4	$442	53.0	$6,150
Conveyed						
Malheur	35.6	$3,629	0	$0	35.6	$3,629
Umatilla	20.1	$2,089	0	$0	20.1	$2,089
Wallowa-Whitman	3.8	$914	0	$0	3.8	$914
Total	59.6	$6,632	0	$0	59.6	$6,632
Net Change[2/]						
Malheur	-17.1	-$710	0	$0	-35.6	-$3,629
Umatilla	26.9	$4,241	3.0	$103	7.2	$606
Wallowa-Whitman	31.6	$4,360	5.5	$339	21.8	$2,541
Total	41.4	$7,891	8.4	$442	-6.6	-$482

1) Annual maintenance costs represent the annual costs of maintaining the roads to standard at their current maintenance level. Current costs for annual maintenance are estimated at $35 per mile for closed roads and $245 per mile for roads that are open and maintained for high clearance vehicles.
2) Net change is the difference between the miles and costs on the acquired and conveyed lands. A positive net change indicates an increase in deferred maintenance costs to the Forest Service.
Source: FS, 2004d

Mine Portals- There are a number of open mine portals on the proposed exchange lands that would be acquired under Alternative 1. Two of these portals, located on parcels PW6 and PW2B, respectively, would need to be gated. The FS would install bat-friendly gates at each portal at an estimated one-time cost of $2,500 per portal (Table 113). There are also two open portals located on parcel PW-1. These parcels are, however, located on the east side of the Imnaha River and generally inaccessible, and, therefore, pose a very low safety hazard risk.

Facilities- Facilities and parcel inspections completed by the FS identified a range of facilities on the private and state parcels that would be acquired under Alternative 1. These facilities include cabins and outhouses, as well as household garbage and wood and metal debris, such as household appliances and old cars. The FS would prefer that most of these parcels be cleaned up and all materials, including

existing structures, removed prior to acquisition. There are two exceptions, parcels PM26 and PW48, where the FS would acquire the parcels with existing structures intact. These structures include two cabins, two sheds, two pit toilets, and a barn. There would be a one-time cost of approximately $10,000 associated with the acquisition of each parcel (Table 113). This includes the cost of historic evaluation and recording, as well as management/retention of the each site for its historic value (FS, 2004e).

Noxious Weeds- Noxious weed sites presently exist on the parcels that would be conveyed and also on the parcels that would be acquired. Transferring the deeds for the parcels would not itself create conditions favoring noxious weed establishment, but it would result in a net change in the acres of noxious weed sites on NFS lands. Noxious weed management costs on NFS lands are approximately $125 per acre per year. Alternative 1 would result in the FS exchanging 54 acres of inventoried noxious weeds for approximately 910 acres of mapped noxious weeds. This net increase of 856 acres would result in a net increase in annual weed management costs of $107,000 (Table 114). These costs would likely decrease over time because active management would decrease the number of acres occupied by noxious weeds (FS, 2004f).

Fire Suppression Management- This alternative would involve the exchange of Federal parcels that are either isolated individual parcels or extensions of NFS lands that result in irregular-shaped boundaries for non-Federal parcels that are either surrounded by or adjacent to existing NFS lands. Reducing the number of isolated parcels and irregular-shaped boundaries would generally reduce Federal fire suppression costs.

The structures on PM26 and PW48 would require structure protection, which would be facilitated by the preparation of structure protection plans following the exchange. There would be a net gain of 13,569 acres under Alternative 1. This net increase represents less than 1 percent of the total acreage on the Malheur, Umatilla, and Wallowa-Whitman National Forests, which include almost 5 million acres, and is not expected to affect any existing FS fire suppression budgets (FS, 2004g).

Fuels Management- Alternative 1 would have the overall effect of blocking up ownerships and reducing the number of non-Federal inholdings. This type of consolidation generally has the effect of allowing fuel reduction work on public lands to be applied on larger landscape scales with fewer boundary issues, with a net effect of reducing the cost and complexity of prescribed treatments. It is not, however, possible to estimate the potential savings associated with this alternative.

There are several Federal parcels that would be conveyed under Alternative 1 that are important from a fuels reduction perspective. These include parcels FW6D, FW6F, FW10, FW24, FU26, FU28, and FM12. These parcels are strategically placed on the landscape to most effectively implement fuels reduction treatments on these and adjacent public lands (FS, 2004h).

Some harvested non-Federal parcels that would be acquired under this alternative would require public investment in future fuel treatments (thinning, piling, underburning). Some timbered conveyed parcels would also need fuels treatment. Most of the larger and more fire resistant trees have been removed on the private parcels where logging has occurred. Recent harvest on private parcels has also removed larger second growth trees. Large tree harvest has also occurred on public lands, but not so uniformly. Alternative 1 would result in a net loss of large trees and may need fuel reduction work in some acquired parcels. Heavily logged parcels that would be acquired currently have slash and slash piles. These parcels have either complied with State BMPs slash disposal requirements or would achieve compliance prior to their acquisition. It is not possible to estimate the extent of the fuels treatment work that may be required or the associated costs, but these costs would represent a net increase in cost compared to the No Action Alternative (FS, 2004h). In summary, because of the large number of acres that would be acquired the benefits of blocking up ownership outweigh the negative consequences of Alternative 1.

Special Use Authorizations- The parcels that would be conveyed under Alternative 1 include 10 special-use permits. Three of these permits would likely be eliminated, resulting in a net saving in special-use permit costs of approximately $18,500 (Table 113). This saving would occur once over the 10-year planning period. The other seven permits would remain in place because they also involve other land that would remain part of the NFS.

Access and Compliance- In cases where Federal parcels do not have legal access, it is FS policy to acquire permanent exclusive easements to allow full use of these lands. All parcels acquired under Alternative 1 would be acquired with legal access, including access for the public, as appropriate. The FS would, therefore, not incur easement acquisition costs on private lands that would be acquired under this alternative. There do, however, exist easement acquisition costs that would be no longer be incurred under Alternative 1.

There are two types of cases where easement acquisition costs currently exist. First, there are Federal exchange parcels where legal access does not currently exist or has not been perfected. Second, there are non-Federal exchange parcels where the need for a right-of-way across these parcels to access adjacent public lands has been identified but not yet acquired.

Twenty-eight Federal parcels that would be conveyed under Alternative 1 do not currently have legal access. There are currently 18 non-Federal parcels that would be acquired under Alternative 1 where the need for a right-of-way to access adjacent public lands have been identified but not yet acquired. The easement acquisition saving associated with Alternative 1 is estimated to be a one time saving of $440,000 (Table 113) (FS, 2004i).

Alternative 1 could also result in a reduction in the number of requests from private landowners to construct access roads across Federal lands that would be conveyed. If this were to occur, Alternative 1 would result in a reduction in costs incurred by the FS to process easement and permit requests or conduct NEPA analyses that might otherwise be needed. These potential savings cannot be estimated because the FS cannot predict future access requests and the costs associated with processing these types of requests can vary considerably. Some cases are resolved relatively quickly, while others involve numerous regulatory or legal issues and can take years to complete at a substantial cost.

Alternative 2: No Action

The lands proposed for exchange would continue to be owned and managed by their current owners. Current social and economic trends would continue under Alternative 2. Private parcels identified for exchange would, for example, continue to contribute to tax revenues. These continued effects, which are described in the following paragraphs, represent the base case against which the other alternatives are evaluated.

Employment and the Economy
Total employment in the six-county exchange study area would not be affected under Alternative 2. Employment in this area increased by 13,780 jobs, or 22 percent, between 1990 and 2000 (PR). Nonfarm employment projections developed by the Oregon Employment Department anticipate continued employment growth in the three Oregon regions that include the six study area counties. Projected increases in these regions from 2002 to 2012 range from 7.4 percent to 8.5 percent, compared to a statewide average increase of 13.7 percent (Oregon Employment Department, 2003d).

Lumber and Wood Products- Assuming that all of the available timber on the non-Federal exchange lands would be harvested within 10 years and the harvest spread evenly over this period, the average annual harvest from these lands would be approximately 4.6 MMBF (Table 110). This average annual harvest, which represents approximately 23 percent of the total harvest in the six study area counties in 2003,

would support approximately 42 FTE direct, indirect, and induced jobs and approximately $1.2 million in income (Table 111). Assuming that the employment would for the most part take place in the same county that the harvest occurs, the majority of this employment and income would be supported in Grant, Umatilla, and Wallowa counties (Table 111).

Recreation and Tourism- Under Alternative 2, recreation opportunities would remain essentially unchanged from current conditions. Access to NFS and private and state lands would remain the same. Fishing access to the Imnaha River would remain limited and some trails in Wilderness areas would continue to cross private parcels (FS, 2004c).

Agriculture- There would be no change to current livestock management under Alternative 2.

Traditional Uses and Lifestyles

Hells Canyon National Recreation Area- There would be no lands exchanged within the HCNRA under Alternative 2. This does not, however, necessarily mean that current land uses on private lands within the HCNRA would continue unchanged into the future. The survey summary of the current non-Federal exchange parcels owners conducted by Clearwater Land Exchange-Oregon suggested that the majority of current owners within the HCNRA would offer their properties for sale if they are not included as part of this proposed exchange (Andersen, 2003). If these properties were sold rather than exchanged, the future use would depend on the new owner. It is possible that these parcels could be acquired for agricultural use. It is also possible that they could be acquired for private recreational or seasonal use. The results of the Clearwater survey also suggested that the owners of 20 of the private exchange parcels located within the HCNRA would develop recreational home sites on these parcels if they are not included as part of the proposed exchange. Recent land use trends in Wallowa County include the development of log and other relatively large homes that are inconsistent with the existing pastoral landscape, traditionally dominated by working ranches and associated structures (Kohrman, 2004b).

Government Taxes and Revenues

Federal 25 Percent Fund- Federal 25 Percent Fund payments to all six study area counties are fixed through 2006 and are not tied to revenue produced from FS activities. County full payment amounts (identified by county in Table 105) range from $351,700 for Morrow County to $9,549,300 for Grant County.

Federal Payments in Lieu of Taxes- Alternative 2 would not affect Federal PILT payments to the six counties. There would be no exchange of land and no change in entitlement acres. PILT payments in the study area in 2003 ranged from $27,268 in Morrow County to $389,426 in Union County (see Table 106).

Oregon Property Tax- There would be no change in the number of acres subject to Oregon property taxes under this alternative and, therefore, no change in local property tax revenues.

Oregon Forest Products Harvest Tax- The Oregon Forest Products Harvest Tax is paid on timber cut on all land in Oregon. There would be no change in projected exchange land harvests under this alternative. Assuming for the purposes of analysis that the rate would be $3.27 per MBF, harvest under Alternative 2 would generate annual tax revenues of approximately $15,000.

Land Management Administrative Costs

Property Boundaries- Under Alternative 2, the boundaries of the Federal exchange parcels would remain as they currently are. As part of ongoing management activities, an estimated 157 miles of property boundaries associated with these parcels would need to be located and marked. This would result in estimated one-time boundary survey and marking costs of approximately $1.5 million. The FS would also continue to maintain these Federal parcel boundaries that have already been located and marked, with a total maintenance cost of approximately $520,000 (Table 115).

In addition to the costs of marking and maintaining National Forest boundaries, the FS also incurs costs associated with property boundary disputes, primarily encroachments/trespass by adjacent landowners. There would be no change in the potential for these types of disputes to occur in the future under the No Action Alternative.

Roads- Under Alternative 2, the FS would continue to be responsible for annual maintenance costs of approximately $7,000 for the roads located on the non-exchange Federal parcels. The FS would also be responsible for deferred maintenance costs of about $34,000 (FS 2004d)).

Alternative 2 would have no effect on any existing cost share easement agreements (FS, 2003b).

Mine Portals and Facilities- There would be no new lands acquired under this alternative and, as a result, there would be no additional mine management or facilities costs.

Noxious Weeds- Alternative 2 would have no net change in the acres of noxious weeds.

Fire Management- There would be no change in existing fire management or fuel assessment costs and savings under Alternative 2.

Special Use Authorizations- There would be no change to existing special use authorizations under Alternative 2.

Access and Compliance- There would be no lands exchanged or purchased under this alternative. There are, however, existing easement acquisition costs associated with some Federal parcels where legal access does not currently exist or has not been perfected. There is also existing easement acquisition costs associated with some non-Federal exchange parcels where the need for legal access across these parcels has been identified but not yet acquired. These costs are estimated to be approximately $440,000 (FS, 2004i).

The FS could potentially incur costs associated with processing requests from private landowners to construct access roads across Federal lands that would be conveyed under Alternative 1. These costs include the costs of processing easement and permit requests, as well as evaluating environmental compliance and conducting NEPA analyses. These costs cannot be estimated because the FS cannot predict future access requests and the costs associated with processing these types of requests can vary considerably.

Alternative 3: Purchase

Under this alternative, the Forest Service would purchase 4,249 acres of private property. No Federal parcels would be conveyed. The majority of the lands that would be acquired under this alternative (87 percent) would become part of the Wallowa-Whitman National Forest (3,676 acres). The remaining 13 percent (573 acres) would become part of the Umatilla National Forest. The majority of these acres (89 percent) are located in Wallowa County, with parcels also located in Umatilla (343 acres), Grant (59 acres), and Union (47 acres) counties (Table 109).

Employment and the Economy

Lumber and Wood Products- Alternative 3 would result in a net loss of private acres and a small reduction in average annual timber available for harvest (Table 110). This change in projected harvest volume is not expected to affect current trends in local timber harvest and existing forest-related employment levels. The projected net reduction in volume would equate to less than one FTE job (Table 111).

Recreation and Tourism- There would be no immediate change in access to the parcels that would be purchased under this alternative. Private parcels that currently have access restrictions would continue to

have the same restrictions under Federal management. Access to the purchased parcels would be addressed through future planning efforts. The parcels purchased would, however, ultimately provide much needed fishing access to the Imnaha River and improve trail user satisfaction in the Hells Canyon and Eagle Cap wildernesses, among other things (FS, 2004c). These developments could result in increased recreation use in the future relative to Alternative 2 and could, in turn, have positive employment and income effects. It is not, however, possible to quantify this potential increase in use or the amount of this potential increase that would represent new recreation use in the area.

Agriculture- There would be no Federal parcels conveyed under Alternative 3. The FS would instead purchase a total of 34 parcels (3,669 acres) that are within identified grazing allotments. There would be no change in current management or stocking on FS allotments and livestock activities would continue on purchased parcels within active allotments (FS, 2004k). This alternative would, therefore, have no effect on livestock grazing-related employment or income.

Traditional Uses and Lifestyles

Hells Canyon National Recreation Area- The FS would purchase 3,414 acres of private lands located within the HCNRA under this alternative, approximately 10 percent of the existing private lands in the HCNRA. This represents approximately half of the private HCNRA parcels that would be acquired under Alternative 1 and includes a number of parcels located along the Imnaha River corridor. As a result, the potential effects of Alternative 3 on traditional uses and lifestyles within and adjacent to the HCNRA are likely to be similar to those discussed under Alternative 1. While the effects are likely to be the same in some areas, the overall effects would likely be less under Alternative 3 than they would be under alternatives 1 and 4 because fewer private HCNRA parcels would be purchased.

Government Taxes and Revenues

Overview- This alternative would involve the purchase of 4,249 private acres and a commensurate net reduction in the number of acres subject to Oregon property taxes. Approximately 90 percent (3,800 acres) of this reduction would occur in Wallowa County (Table 109).

This net reduction in private lands subject to property taxes would result in a small decrease in local property tax revenues that would be partially offset by an increase in PILT payments, which are intended to help offset losses in property taxes associated with nontaxable Federal land. Estimates developed for this analysis indicate that Alternative 3 would result in an overall net reduction in property tax revenue of approximately $2,000 for the six counties as a whole, with the majority of this reduction occurring in Wallowa County (Table 112). This reduction would be equivalent to less than 0.1 percent of total property taxes imposed in Wallowa County in FY 2003-04 (see Table 107).

Federal 25 Percent Fund- There would be no change in Federal 25 Percent Fund payments under Alternative 3. Federal 25 Percent Fund payments to all six study area counties are fixed through 2006 and are not tied to revenue produced from FS activities.

Federal Payments in Lieu of Taxes- Alternative 3 would have a minimal effect on Federal PILT payments to the six study area counties. The net gain in Federal acres under this alternative (4,249 acres) represents approximately 0.1 percent of the total entitlement acres in the six-county study area in 2003. Based on 2003 payment levels, this net increase in acres would result in a total increase in annual PILT payments of less than $1,000 to the six-county study area.

Oregon Property Tax- There would be an estimated net reduction in property tax revenue of approximately $2,000 for the six-county study area as a whole under this alternative, with the majority of this reduction occurring in Wallowa County (Table 112). This reduction would be equivalent to less than 0.1 percent of total property taxes imposed in Wallowa County in FY 2003-04 (Table 107).

Oregon Forest Products Harvest Tax- There would be a minor net annual reduction in harvest under this alternative (Table 108). Assuming for the purposes of analysis that the rate would be $3.27 per MBF, there would be a net annual decrease in Oregon Forest Products Harvest Tax revenues of less than $1,000 under Alternative 3.

Land Management Administrative Costs

Overview- Alternative 3 differs from the other two action alternatives because it involves the purchase of private lands, rather than the exchange of Federal lands for non-Federal lands of equal value. The purchase of these lands would be spread over a five-year period and would likely involve 14 separate purchase cases, with an estimated one-time case processing cost of $17,500 per case. These estimated case processing costs include appraisal costs, legal description review, deed preparation, title docket preparation, and title insurance/closing costs. This would result in a total estimated case processing cost of $245,000. It is likely that the value of the parcels to be purchased will increase annually, increasing the cost to the Federal government for the parcels purchased after the first year. It is not possible to accurately quantify this potential cost increase, but discussions with local realtors and appraisers suggest the properties that would be purchased, which likely have a highest and best use as recreational properties, would increase in value at an average annual rate of approximately 5 percent.

There would be a one-time reduction in administrative costs of approximately $25,000 under this alternative (Table 113). This saving is lower than under the other action alternatives because there would be less land purchased under Alternative 3 and fewer property boundary surveys and marking costs that would no longer be necessary. There would also be the estimated case processing cost, described above, that would not be incurred by the other action alternatives.

There would be a net increase in annual administrative costs of approximately $37,000 (Table 114). The majority of these costs would be incurred for noxious weed management on the lands that would be purchased under this alternative. These management costs would likely decrease over time because active management would reduce the number of acres occupied by weeds.

There are also several types of potential costs and savings that cannot be quantified. These include changes in fire management costs and potential reductions in requests for access across NFS lands.

The following discusses projected administrative costs in more detail by affected resource.

Property Boundaries- Total additional property boundary costs under Alternative 3 would be approximately $116,000, with the majority of this cost ($108,000) associated with surveying and marking the 10.8 miles of new property boundary that result under this alternative. Approximately 86 percent of these costs would be incurred on the Wallowa Whitman National Forest where approximately 9 miles of new property boundary would need to be surveyed and marked (Table 115).

Property boundary savings under this alternative would be approximately $380,000. Approximately $357,000 of these savings would result from 36 miles of existing unmarked boundaries that would no longer need to be surveyed and marked. The remaining savings (approximately $25,000) would result from existing marked property boundaries that would no longer need to be maintained. Approximately 93 percent of these savings would occur on the Wallowa-Whitman National Forest where approximately 34 miles of existing unmarked boundaries would no longer need to be surveyed and marked (Table 115).

Combined, the estimated property boundary costs and savings associated with Alternative 3 would result in a net saving of approximately $265,000 (Table 115). This would be a total one time saving over the 10 year planning period used for this analysis.

In addition to the costs of marking and maintaining National Forest boundaries, the FS also incurs costs associated with property boundary disputes, primarily encroachments/trespass by adjacent landowners. There would be no change in the potential for these types of disputes to occur in the future under Alternative 3.

Roads- Under this alternative the FS would acquire jurisdiction over approximately 8.4 miles of road, with deferred maintenance costs of approximately $2,400 (Table 116). Annual maintenance costs would increase by approximately $440 (Table 117).

This alternative would have no effect on any existing cost share easement agreements (FS, 2003b).

Mine Portals- One mine portal, located on parcel PW2B, would need to be gated under this alternative at an estimated one-time cost of $2,500 (Table 113).

Facilities- Facilities and parcels inspections completed by the FS identified a range of facilities on the private and state parcels that would be purchased. The FS would prefer that most of these parcels be cleaned up and all materials, including existing structures, removed prior to acquisition. There is one exception, parcel PW48, where the FS would purchase the parcel with existing structures, which include a cabin, shed, pit toilet, and barn, intact. There would be a one-time cost of approximately $10,000 associated with the acquisition of this parcel (Table 113). This includes the cost of historic evaluation and recording, as well as management/retention of the site for its historic value (FS, 2004e).

Noxious Weeds- Noxious weed sites presently exist on the parcels that would be purchased under this alternative. The FS would purchase approximately 294 acres that would require management at an annual cost of approximately $125 per acre. This would result in a net annual increase in noxious weed management costs of approximately $36,750 (Table 114). These costs would likely decrease over time because active management would decrease the number of acres occupied by noxious weeds (FS, 2004f).

Fire Suppression Management- Under Alternative 3, the FS would purchase parcel PW48 and associated structures that would require structure protection. Protection of these structures would be facilitated by the preparation of a structure protection plan.

There would be a net gain of 4,249 acres under this alternative (Table 109). This net increase represents less than 1 percent of the total acreage on the Malheur, Umatilla, and Wallowa-Whitman National Forests, which include almost 5 million acres, and is not expected to affect any existing FS fire suppression budgets (FS, 2004g).

Fuels Management- Alternative 3 would have the overall affect of blocking up ownerships and reducing the number of non-Federal inholdings. This type of consolidation generally has the effect of allowing fuel reduction work on public lands to be applied on larger landscape scales with fewer boundary issues, with a net effect of reducing the cost and complexity of prescribed treatments. The purchased parcels would, however, require public investment in future fuel treatments (thinning, piling, underburning) (FS, 2004h). It is not possible to estimate the costs or savings that would be associated with this alternative.

Special Use Authorization- There would be no change to existing special use authorizations under Alternative 3.

Access and Compliance- All private land purchased would be acquired with legal access including access for the public, as appropriate. The FS would, therefore, not incur any easement acquisition costs on private lands that would be purchased under Alternative 3. There are, however, existing easement acquisition costs that would no longer be incurred under this alternative. There are three private parcels that would be purchased where legal access has not been acquired and a right-of-way need is currently

identified to access adjacent public lands. The easement acquisition saving associated with this alternative is estimated to be a one-time saving of $20,000 (Table 113; FS, 2004b).

Alternative 4: Deed Restriction

Under this alternative, Federal parcels would be conveyed with deed restrictions that the FS would monitor for the foreseeable future. These deed restrictions would include general harvest restrictions, as well as riparian habitat-related restrictions. Alternative 4 would involve the same Federal parcels as Alternative 1, but the amount of non-Federal acres to be acquired would be reduced from 31,741 acres under Alternative 1 to 17,119 acres. This would occur because the deed restrictions would reduce the commercial value of the Federal parcels. This reduction in commercial value is difficult to quantify but was assumed to be in the region of approximately 50 percent for the purposes of developing Alternative 4.

More than half of the total acres that would be acquired under this alternative (62 percent) are located in Wallowa County (10,677 acres), with the remaining acres spread across Umatilla (4,718 acres), Grant (1,277 acres), Union (288 aces), and Morrow (159 acres) counties (Table 109). There would be a net loss in Federal acres in all counties, with the exception of Wallowa County where there would be a net increase of 6,067 acres.

Employment and the Economy
Lumber and Wood Products- Alternative 4 would result in a net increase in private acres and an increase in the supply of timber available for harvest. The conveyed parcels plus the private parcels not acquired include approximately 61.7 MMBF of harvestable timber resources that would be available for harvest under this alternative (Table 110). This volume is lower than the volume that would be available under Alternative 1, which involves the same Federal parcels, because of the deed restrictions that would be imposed under this alternative.

This total volume is equivalent to 31 percent of total harvest in the six-county area in 2003. The available volume would be concentrated in Grant, Umatilla, and Wallowa counties, and represents approximately 69 percent and 129 percent of the respective volumes harvested in Grant and Umatilla counties in 2003.

The net increase in volume available for harvest under this alternative would be approximately 15.7 MMBF (Table 110), which is equivalent to approximately eight percent of the volume harvested in the six-county area in 2003. The net increase in Grant and Umatilla counties would be equivalent to 37 percent and 10 percent of total harvest in 2003, respectively.

Assuming that this volume would be harvested within 10 years and the harvest spread evenly over this period, the net gain in average annual harvest would be approximately 1.6 MMBF (Table 110). This net increase in harvest would support approximately 14 FTE jobs and $400,000 in income each year (Table 111). Assuming that the employment would for the most part take place in the same county that the harvest occurs, the majority of this employment and income would be supported in Grant County (Table 111).

This projected increase in average annual harvest is not expected to substantially alter current trends in local timber harvest or existing forest-related employment levels. The total net increase in timber available for average annual harvest is equivalent to 1 percent of the total harvest in the six study area counties in 2003. The majority of this net annual increase would occur in and is equivalent to approximately 4 percent of the harvest in Grant County in 2003.

Recreation and Tourism- This alternative includes a covenant on the Federal lands that would be conveyed. These parcels would continue to be managed (for the most part) in accordance with the management restrictions and parameters they are currently managed under.

There would be no immediate change in access to the parcels that would be acquired under Alternative 4. Acquired parcels that currently have access restrictions would continue to have the same restrictions under Federal management. Recreation and access issues associated with acquired parcels would be addressed through future planning efforts. The parcels acquired would, however, ultimately provide much needed fishing access to the Imnaha River and improve trail user satisfaction in the Hells Canyon and Eagle Cap wildernesses, among other things (FS, 2004c). These developments could result in increased recreation use in the future relative to Alternative 2 and have associated positive employment and income effects. It is not, however, possible to quantify this potential increase in use or the amount of this potential increase that would represent new recreation use in the area.

Agriculture- Under Alternative 4, the FS would acquire 84 parcels (11,603 acres) within existing allotments and convey 62 parcels (15,450 acres) within allotments for a net loss of 3,847 acres. Although the acquired parcels would add capacity to the affected allotments, there would be no increase in stocking until further analysis is conducted. The FS would, however, no longer manage five pastures on four allotments, which would result in a reduction of permitted stocking by 404 AUMs. The parties receiving the conveyed lands have, however, expressed interest in continuing to graze these lands with two exceptions. These two exceptions combined currently account for 106 permitted AUMs (FS, 2004k). This projected change is not expected to have any measurable effect on local employment or income.

The FS would also acquire 1,222 acres outside allotments that are presently being grazed and convey 1,133 acres outside allotments that the parties receiving the lands have expressed an interest in grazing. Grazing would be discontinued on the parcels that would be acquired (FS, 2004k). The associated net change in AUMs is unknown, but it is not expected to have a measurable effect on local employment or income.

Traditional Uses and Lifestyles

Hells Canyon National Recreation Area- The FS would acquire 8,199 acres of non-Federal parcels located within the HCNRA under Alternative 4 and would, in turn, convey 695 acres of Federal parcels in the HCNRA. These are the same parcels that would be exchanged under Alternative 1 and, as a result, the potential effects of Alternative 4 on traditional uses and lifestyles within and adjacent to the HCNRA would be the same as those discussed under Alternative 1.

Government Taxes and Revenues

Overview- This alternative would involve the conveyance of 18,172 Federal acres and acquire 17,119 non-Federal acres, which would result in a net loss of 1,053 Federal acres (an increase of private lands when compared to Alternative 2). Viewed at a county level, this alternative would result in a net loss of approximately 4,398 Federal acres and 2,349 Federal acres in Grant and Umatilla counties, respectively, and a net gain of 6,067 Federal acres in Wallowa County (Table 109).

This overall net increase in private lands subject to property taxes would result in a slight overall net increase in property tax revenue of approximately $1,000 for the six-county study area as a whole. The net reduction in private acres in Wallowa County would result in an estimated net reduction of property tax revenues of approximately $2,000, less than 0.1 percent of total property taxes imposed in this county in FY 2003-04 (see Table 107).

Federal 25 Percent Fund- Federal 25 Percent Fund payments to all six study area counties are fixed through 2006 and are not tied to revenue produced from FS activities. There would be no change in Federal 25 Percent Fund payments under this alternative.

Federal Payments in Lieu of Taxes- Alternative 4 would have a minor effect on Federal PILT payments to the six study area counties. The very small net loss in Federal acres under this alternative (-1,053 acres) represents less than 0.1 percent of the total entitlement acres in the six-county study area in 2003. Based

on 2003 payment levels, this net reduction in acres would result in a total annual reduction in annual PILT payments of approximately $500 to the six-county study area.

Oregon Property Tax- There would be an estimated net increase in property tax revenue of approximately $1,000 for the six-county study area as a whole under this alternative (Table 112). The majority of the increase in property tax revenues under this alternative would occur in Grant County (Table 112). The net reduction in private acres in Wallowa County would result in an estimated net reduction of property tax revenues of approximately $2,000, less than 0.1 percent of total property taxes imposed in this county in FY 2003-04 (see Table 107).

Oregon Forest Products Harvest Tax- There would be a net annual increase in timber harvest of approximately 1.6 MMBF under this alternative (Table 112). Assuming for the purposes of analysis that the rate would be $3.27 per MBF, there would be a net annual increase of about $5,000 in this tax under Alternative 4.

Land Management Administrative Costs

Overview- The estimated annual cost for overseeing and monitoring deed restrictions is $30,550 (Table 114). This estimate is based on the time that would be necessary to conduct and administer annual inspections on the deed restriction parcels. The estimate does not include potential costs associated with non-compliance with deed restrictions or challenges to deed restrictions. Resolution of these types of issues, should they occur, may range from simple mitigation to court action.

There would be an estimated one-time administrative saving of about $610,000 under Alternative 4. The majority of these savings would be due to easement acquisitions and property boundary surveys that would no longer be necessary (Table 113). There would be a net increase in annual administrative costs of approximately $130,000 under Alternative 4 (Table 114). The majority of these costs would be incurred for noxious weed management on the lands that would be acquired under this alternative. These management costs would likely decrease over time because active management would reduce the number of acres occupied by weeds.

There are also several types of potential costs and savings that cannot be quantified. These include changes in fire management costs and potential reductions in requests for access across NFS lands.

The following discusses projected administrative costs in more detail by affected resource.

Property Boundaries- Total additional property boundary costs under Alternative 4 would be approximately $714,000, with the majority of this cost ($680,000) associated with surveying and marking the 68 miles of new property boundary that result under this alternative. Approximately 59 percent of these costs would be incurred on the Wallowa-Whitman National Forest where approximately 40 miles of new property boundary would need to be surveyed and marked (Table 115).

Property boundary savings under this alternative would be approximately $1 million. Approximately $0.9 million of these savings would result from 94 miles of existing unmarked boundaries that would no longer need to be surveyed and marked (Table 115). The remaining savings would result from existing marked property boundaries that would no longer need to be maintained. Approximately 87 percent of these total savings would occur on the Wallowa-Whitman National Forest where 85 miles of existing unmarked boundaries would no longer need to be surveyed and marked (Table 115).

Combined, the estimated property boundary costs and savings associated with Alternative 4 would result in a net saving of approximately $332,000 (Table 115). This would be a total one time saving.

In addition to the costs of marking and maintaining National Forest boundaries, the FS also incurs costs associated with property boundary disputes, primarily encroachments/trespass by adjacent landowners. It is possible that the number of these disputes and the associated costs would be reduced under Alternative 4 because there would be a decrease in the number of isolated parcels owned by the FS, as well as a decrease in privately-owned in-holdings surrounded by NFS lands. The FS has identified potential encroachment-related costs of approximately $46,000 that would be saved under Alternative 4 (Table 113).

Roads- Under Alternative 4, the FS would acquire 53 miles of roads and convey 59.6 miles for a net decrease of 6.6 miles of road (Table 116). The Malheur National Forest would experience a net reduction in road miles (-35.6 miles) while the Umatilla and Wallowa-Whitman would both experience net gains (7.2 miles and 21.8 miles, respectively). Overall, the FS would experience a net increase in one-time, deferred maintenance costs that would range from about $15,000 to $64,000 (Table 116).

Annual maintenance costs would decrease by approximately $500. These costs would decrease on the Malheur National Forest and increase on the Umatilla and Wallowa-Whitman (Table 117).

The exchange parcels include an additional 49 miles of roads that would remain under their existing jurisdiction. The FS would reserve jurisdiction on approximately 10 miles of existing roads on conveyed lands to maintain access to other Forest roads or lands. Approximately 2.5 miles of the acquired roads that are currently open would need to be closed for public safety. The rest of these roads (39 miles) are located on parcels that would be acquired.

This alternative would have no effect on any existing cost share easement agreements (FS, 2003b).

Mine Portals- Bat-friendly gates would need to be installed at two mine portals on parcels PW6 and PW2B at a total cost of $5,000 (Table 113).

Facilities- Facilities and parcels inspections completed by the FS identified a range of facilities on the private and state parcels that would be acquired under Alternative 4. The FS would prefer that most of these parcels be cleaned up and all materials, including existing structures, removed prior to acquisition. There is one exception, parcel PW48, where the FS would acquire the parcel with existing structures, which include a cabin, shed, pit toilet, and barn, intact. There would be a one-time cost of approximately $10,000 associated with the acquisition of this parcel (Table 113). This includes the cost of historic evaluation and recording, as well as management/retention of the site for its historic value (FS, 2004e).

Noxious Weeds- Noxious weed sites presently exist on the parcels that would be conveyed and also on the parcels that would be acquired. Transferring the deeds for the parcels would not itself create conditions favoring noxious weed establishment, but it would result in a net change in the acres of noxious weed sites on Federal lands. Noxious weed management costs on NFS lands are approximately $125 per acre. Alternative 4 would result in the FS exchanging 54 acres of inventoried noxious weeds for approximately 858 acres of mapped noxious weeds. This net increase of 804 acres would result in a potential net increase in annual weed management costs of approximately $100,500 (Table 114). These costs would likely decrease over time because active management would decrease the number of acres occupied by noxious weeds (FS, 2004f).

Fire Suppression Management- This alternative would involve the exchange of Federal parcels that are either isolated individual parcels or extensions of NFS lands that result in irregular-shaped boundaries for individual non-Federal parcels that are either surrounded by or adjacent to existing NFS lands. Reducing the number of isolated parcels and irregular-shaped boundaries would generally reduce Federal fire suppression costs. Under this alternative, the FS would acquire parcel PW48 and associated structures that

would require structure protection. Protection of these structures would be facilitated by the preparation of a structure protection plan.

Alternative 4 would result in a net loss of 1,053 acres (Table 109). This net decrease represents less than 0.1 percent of the total acreage on the Malheur, Umatilla, and Wallowa-Whitman National Forests, which include almost 5 million acres, and is not expected to affect existing FS fire suppression budgets (FS, 2004g).

Fuels Management- Alternative 4 would have the overall affect of blocking up ownerships and reducing the number of non-Federal inholdings. This type of consolidation generally has the effect of allowing fuel reduction work on public lands to be applied on larger landscape scales with fewer boundary issues, with a net effect of reducing the cost and complexity of prescribed treatments. It is not, however, possible to estimate the potential savings associated with this alternative.

There are several Federal parcels that would be conveyed under Alternative 4 that are important from a fuels reduction perspective. These include parcels FW6D, FW6F, FW10, FW24, FU26, FU28, and FM12. These parcels are strategically placed on the landscape for fuels reduction treatments on these and adjacent public lands (FS, 2004h).

Some harvested non-Federal parcels that would be acquired under this alternative would require public investment in future fuel treatments (thinning, piling, underburning) although some timbered conveyed parcels also need fuels treatment. Most of the larger and more fire resistant trees have been removed on the private parcels where logging has occurred. Recent harvest on private parcels has also removed larger second growth trees. Large tree harvest has also occurred on public lands, but not so uniformly. This alternative would result in a net loss of large trees and some need for fuel reduction work in a few acquired parcels. Heavily logged parcels that would be acquired have slash and slash piles. These parcels have either complied with State BMPs slash disposal requirements or would achieve compliance prior to their acquisition. It is not possible to estimate the extent of the fuels treatment work that would be required or the associated costs, but these costs would represent a net increase in cost compared to the No Action Alternative (FS, 2004h). In summary, because of the large number of parcel acres that would be acquired the benefits of blocking up ownership outweighs the negative consequences of Alternative 4.

Special Use Authorization- The conveyed parcels under this alternative include 10 special use permits. Three of these permits would likely be eliminated resulting in a net saving in special use permit costs of approximately $18,500 (Table 113). This saving would occur once over the 10-year planning period. The other seven permits would remain in place because they involve other land that would remain part of the NFS.

Access and Compliance

Twenty-eight Federal parcels that would be conveyed under Alternative 4 do not currently have legal access. There are also 10 parcels that would be acquired under Alternative 4 where legal access has not been acquired and a right-of-way need is currently identified to access adjacent NFS lands. The costs associated with acquiring this legal access and necessary rights-of-way would not be incurred under Alternative 4, resulting in an estimated one time saving of $360,000 (Table 113; FS, 2004b).

Alternative 4 could result in a reduction in the number of requests from private landowners to construct access roads across lands that would be conveyed. This would result in savings because the FS would not have to process easement and permit requests or conduct NEPA analyses that might otherwise be needed. These potential savings cannot be estimated because the FS cannot predict future access requests and the costs associated with processing these types of requests can vary considerably. Some cases are resolved relatively quickly, while others involve numerous regulatory or legal issues and can take years to complete.

All Action Alternatives

Civil Rights, Minority Groups, Women, and Consumers
The Forest Service Handbook (FSH 1909.17.33) indicates that FS social analyses should consider the effects of each alternative on civil rights, minority groups, women, and consumers. The action alternatives and the NEPA process for this project comply with the Forest Service Handbook's definition of "civil rights", which it states implies fair and equal treatment under the law, both within the agency and in its relations with the public (FSH 1909.17.33). Potential effects to minority groups are discussed in Environmental Justice below, as well as in the separate tribal reports prepared for this project (FS, 2004j & PR). The potential employment and income, tax, administrative cost, and social effects assessed in the preceding discussions would apply to both men and women. The potential effects to consumers are assessed in terms of available recreation opportunities (FS, 2004c).

Environmental Justice
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each Federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations. The Order further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

Potentially affected minority populations include American Indian tribes with an interest in the lands proposed for exchange. The Proposed Land Exchange occurs within areas ceded to the United States by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Nez Perce Tribe, the Burns Paiute Tribe, and the Confederated Tribes of the Warm Springs Reservation. The FS is in the process of ongoing government-to-government consultation with these American Indian tribes. The potential effects to American Indian Tribes are assessed in separate reports prepared for this Proposed Land Exchange (FS, 2004j & PR). The Tribal Interests reports assess the potential effects of all action alternatives on American Indian tribes in terms of access for traditional uses and exercise of Treaty rights, impacts to open and unclaimed lands, cultural resources, and protection of Treaty-identified resources.

While other minority populations and low income populations exist within the six-county study area, the Proposed Land Exchange is not expected to cause disproportionately adverse effects on these populations. The FS has considered all input from persons or groups regardless of race, income status, or other social and economic characteristics.

Commercial Timber

Commercial timber volume was determined by using a timber cruise design similar to that used on FS timber sales but tailored to private industry standards in the NE Oregon area. The cruise as a whole achieved a standard error of 10% or less. It was designed to achieve an error of plus or minus 8% on gross measurements and plus or minus 12% on net measurements for each landowner's parcels.

The minimum log specifications were to a six-inch top diameter inside bark. The minimum log length was sixteen lineal feet, or a minimum piece size of 20 board feet. Trees were not cruised if they did not have a minimum piece size. If export logs were observed upon field inspection, these logs were recorded as such on the Federal and non-Federal parcels.

Parcels that were harvested and where essentially all merchantable trees (as defined above) were removed where not cruised.

Summary

The existing characteristics of the commercial timber conveyed/acquired/purchased by alternative is displayed in Table 118.

Table 118. Commercial Timber Characteristics to Convey/Acquire/Purchase by Alternative

	Alternative 1		Alternative 3		Alternative 4	
	Convey	Acquire	Convey	Purchase	Convey	Acquire
Total. Net Volume. (MBF)	99,722	61,967	0	2,708	99,722	22,415
Net Average Board Feet per Acre	10,357	6,813	0	7,458	10,357	6,584
Average DBH	15.1	13.9	0	14.1	15.1	13.9
Average Basal Area per Acre	81	65	0	69	81	55
Average Trees per Acre	65	60	0	60	65	48
Average Site Index	84	83	0	84	84	83
Commercial Timberlands (Acres)	9,628	9,095	0	363	9,628	3,405

All averages were weighted by acreages of stand alone cruise areas.
Site index is the total height to which dominate cruised conifers will grow at age 100.
The data in this table represents only cruised commercial timber. The cruise design was for Alternative 1, therefore the standard errors for Alternative 3 and 4 may not meet Alternative 1 standards.

Alternative 1: Proposed Exchange

The direct effect of the Proposed Exchange Alternative would be a net reduction of 37,755 MBF (thousand board feet) of timber volume. The 37,755 MBF represents approximately 38% of the conveyed commercial timber volume on cruised commercial forest lands. The cruised commercial forest acres on non-Federal parcels were only 533 acres less than on Federal lands (Table 47). The net average board feet per acre would be significantly less on acquired parcels. This is likely due to previous harvesting on most commercially timbered private parcels. The average DBH on cruised commercial forested lands acquired would be smaller than conveyed by 1.2 inches. Average commercial trees per acre and site index would be close to the same on conveyed and acquired commercial timberlands that were cruised.

Alternative 2: No Action

Under the No Action Alternative, commercial timberland would not change ownership. Anticipated management plans on private parcels supporting commercial timber indicate logging would occur on most lands within the next 10 years.

Alternative 3: Purchase

The Purchase Alternative would result in the FS purchasing 363 acres of commercially timbered areas with a total of 2,708 MBF. The average net board feet per acre on cruised commercial timbered purchased parcels would be significantly less than conveyed parcels under Alternative 1. The average DBH on purchased commercial timberlands would be slightly larger that the average DBH of acquired commercial timber lands under Alternative 1.

Alternative 4: Deed Restriction

The Deed Restriction Alternative would result in a net reduction of 77,307 MBF of cruised commercial timber volume. The 77,307 MBF represents approximately 78% of the cruised conveyed commercial timber on forested lands. The average net board feet per acre would be significantly less on acquired commercial forested parcels as is the case for Alternative 1. The average DBH, basal area per acre, and trees per acre are considerably smaller on acquired cruised commercial timberland than on conveyed timberland. The substantially more commercial timberlands conveyed than acquired (Table 47) would be the result of higher priority parcels being non-commercial timberlands and the reduced value of conveyed parcels because of deed restrictions.

Cumulative Effects

Cumulative effects are effects on the environment that result when the incremental effect of the proposal is added to other past, present, and reasonably foreseeable future actions. This discussion is organized by resource area, and cumulative actions for each resource area are identified.

Social and Economic Environment

Cumulative actions that are pertinent to an analysis of the social and economic environment are as follows:

- A proposal for revision of the Blue Mountain Province Forest Plans has been initiated. This planning effort is scheduled for completion in 2007. At present, a desired future condition has been identified.
- Land exchanges that have occurred in the Blue Mountain vicinity for the last 15 years include the Triangle Land Exchange, the Northeast Oregon Assembled Land Exchange (NOALE), the 1997 Minam/Big Canyon Land Exchange, and the 1994 Clearwater Land Exchange. Other land adjustment activities (purchases, donations, and sales) are also included in table 119, which shows changes in Federal and private jurisdiction.
- A land exchange in the State of Washington, also called the “Blue Mountain Land Exchange” and two BLM exchanges in the State of Washington are ongoing at this time. None of these exchanges are located within the analysis area or affect the counties involved in this exchange.

The total number of acres leaving and entering Federal management since 1990 and the net change are shown in Table 119. With the exception of Grant County, there have been net gains in Federal management in all of the counties.

Table 119. Lands Leaving and Entering Federal Jurisdiction by County.

County	Leaving Federal Jurisdiction (Acres)	Entering Federal Jurisdiction (Acres)	Net Change (Acres)
Baker	1,358	3193	1835
Grant	43,696	35,752	(7,945)
Morrow	761	2,016	1,255
Umatilla	3,752	13,930	10,178
Union	3,133	6007	2,874
Wallowa	9,035	16,944	7,909
Total	**61,735**	**77,841**	**16,102**

Employment and the Economy

The six counties in the study area have had employment increase by 13,780 jobs or 22 percent between 1990 and 2000 (PR). Projections developed for the 2002 to 2012 period anticipate continued overall employment growth in all six counties (Oregon Employment Department, 2003d). These projections are prepared by region and not county. The six counties in the study area are parts of Region 12 (Morrow and Umatilla counties), Region 13 (Baker, Union, and Wallowa counties), and Region 14 (Grant, Harney, and Malheur counties).

Employment projections anticipate that total covered employment in the lumber and wood products sector will decrease between 2002 and 2012 in Regions 12 and 13 by 5 percent and 3 percent, respectively. Projections were not provided for the lumber and wood products sector in Region 14, but the durable goods manufacturing sector (which includes lumber and wood products) was expected to increase by 1.3 percent between 2002 and 2012 (Oregon Employment Department, 2003d). There would be a net increase in timber available for harvest under alternatives 1 and 4, but these increases are not expected to affect these trends.

Overall demand for recreation opportunities is expected to increase in the Blue Mountain region with associated economic impacts. Bowker et al. (1999); for example, estimate that recreation days demanded in the Pacific recreation will increase substantially by 2020, with large projected increases occurring in sightseeing (55 percent), non-consumptive wildlife activities (48 percent), rafting/floating (45 percent), primitive camping (39 percent), developed camping (32 percent), and visiting historic places (28 percent), among others.

These estimates are based on estimated demand rather than the supply or opportunities. However, a relative increase in recreation opportunities under the action alternatives could help facilitate this growth in demand within the study area. The land adjustments that have occurred in the area may have made a minor contribution in this way, with the FS acquiring lands in the Eagle Cap Wilderness and other important recreation areas. Improved fishing access and improved trail satisfaction that would ultimately occur under the action alternatives may also help facilitate this projected growth in demand.

Traditional Uses and Lifestyles

Population projections developed by the State of Oregon in 1997 anticipate continued population growth through 2010 in all of the six counties in the study area , with further increases anticipated by 2020 (PR). Net in-migration accounted for approximately 66 percent of total population growth in the six counties in the study area in the 1990s (PR) and net in-migration is likely to continue, with newcomers continuing to place pressure on traditional uses and lifestyles.

Past land adjustments have resulted in a net increase of 16,102 Federal acres in the six counties in the study area, with much of this increase (10,178 acres and 7,909 acres) occurring in Umatilla and Wallowa Counties, respectively. Alternative 1 would result in the largest net increase in Federal acres, with a net gain of 13,569 acres in the six counties in the study area and much of this increase (9,025 acres) occurring in Wallowa County. Combined with the net increase resulting from prior land adjustments, Alternative 1 would result in a net increase of 29,671 Federal acres, less than 1 percent of the total Federal acres in the six counties in the study area. The cumulative increase in Federal lands in Wallowa County would be equivalent to approximately 1.5 percent of the total Federal acres in that county. The cumulative increase in Federal Lands in Umatilla County would be equivalent to approximately 2.7 percent of the total Federal acres in that county. Grant County has shown a decrease in Federal acres of 7,945 acres.

The direct and indirect effects of a net gain of 7,504 acres for Federal management within the HCNRA were disclosed as a foregone opportunity to continue a ranching lifestyle on those properties. This

reduction may be considered detrimental by local residents and communities who are concerned with preserving traditional uses and lifestyles in the area and may already feel that their way of life is being negatively affected by other factors. The incremental effect of Alternative 1 would be heightened by the past effect of approximately 8,200 acres of Federal land acquisition within the last 15 years.

Government Taxes and Revenues

Viewed in the context of total property tax revenues, the cumulative effects of the Blue Mountain Land Exchange action alternatives and past land adjustments that have occurred in the area on property taxes and revenues are minor. The cumulative net reduction in private acres of Alternative 1 (13,569 acres) and the previous land adjustments in the study area counties (16,102 acres) represent approximately 0.5 percent of private land in the six counties (McGinnis et al, 1996). In addition, these net reductions are partially offset by increases in PILT payments associated with the corresponding increase in Federal acres.

Recreation

Cumulative actions that are pertinent to an analysis of the recreation resource are as follows:

- A Draft National OHV Policy was distributed for public review in 2004. This policy would direct managers to conduct site-specific analysis for designating OHV routes while at the same time eliminating off-road travel.
- Implementation of the HCNRA Comprehensive Management Plan has begun and its effect will soon be evident to Forest visitors as the plan's provisions are posted and enforced. The decision associated with this plan changed traditional access within the HCNRA by specifying that all motorized travel will be restricted to designated routes.

Two existing uses influence the ROS for exchange parcels: Off-Highway Vehicle (OHV) use and private road construction in support of associated activities such as logging. These activities modify the vegetation, access, and social settings which determine an area's ROS setting. Sales and use of OHVs have been on a dramatic increase in the last 10 years. This increased use is noticeable in formerly remote and isolated areas in the Blue Mountains. Although OHV use is restricted to designated routes in individual and/or seasonal closure areas on much of the analysis area, OHV use in thousands of areas is not regulated. This unregulated use has contributed to the creation of user trails and an increase in noise levels that could move some of the Primitive and Semi-primitive ROS settings toward the motorized and Roaded Modified end of the spectrum. The FS has drafted a National Policy on OHV use which is published for public review. A final policy is expected to direct land managers to conduct an analyses for designating suitable OHV routes and areas. The desired condition would result in OHV use prohibited in cross county travel except for designated routes and areas. Within the next 5 to 10 years, it is anticipated OHV use on NFS lands would become fully regulated and less likely to cause shifts in ROS settings.

Alternative 1 would result in a net increase of all ROS class acres except for a reduction of 205 acres in Roaded Modified. The largest increases occur in Semi-primitive Motorized (4,649 acres) and Roaded Natural (7,792 acres).

Future potential changes in ROS class toward more motorized opportunities would be reduced as regulation of OHV use begins. The cumulative effect of this trend, along with the implementation of Alternative 1 would lead to an overall trend toward the less developed end of the ROS spectrum. The cumulative effect of Alternative 4 would be the same. Alternative 3 would purchase parcels only, but would have a similar cumulative effect because this alternative also contributes to a trend toward less motorized ROS opportunities.

Recreation opportunities in the HCNRA would increase as a result of the acquisition of almost 23 percent of the private lands. However, recreation experiences in the HCNRA are shifting toward fewer motorized opportunities with implementation of the HCNRA Comprehensive Management Plan. This decision restricts motorized travel to designated routes only. While a certain amount of restriction on off-road motorized travel previously existed, the decision further reduces motorized travel. Opportunities for non-motorized recreation would increase. The trend of past land adjustments has been to increase the Federal component of lands within HCNRA (8,200 acres). The Proposed Land Exchange would continue that trend with the net acquisition of another 7,504 acres. Cumulative effects of implementing Alternative 4 would be the same as Alternative 1. Alternative 3 would acquire overall less area than Alternatives 1 and 4, but many of the parcels in the HCNRA would be acquired, so the effects of Alternative 3 would be the same as Alternative 1.

Watershed

Parcels in the land exchange are widely dispersed and generally make up a very small portion of the land base at a Watershed (HUC 5) or Subwatershed (HUC 6) scale. Generally, the magnitude of water quality effects of the land exchange would be expected to be low on both the watershed and subwatershed scale. Hydrologic indicators are most sensitive at smaller scales. The fifteen (15) Subwatersheds (SWS) where 5% or more of subwatershed acres are included in the proposed exchange were looked at in detail, and the cumulative effect analysis is focused on the six (6) subwatersheds where 5% or more of the acres are proposed for conveyance. Where less than 5 percent of the acres are proposed for conveyance, the direct and indirect effects of the Proposed Land Exchange were assumed to be negligible at the subwatershed and watershed scale. The incremental effects of the Proposed Land Exchange would then be considered the same as the direct and indirect effects when considered in light of past, present, and foreseeable future actions. Cumulative effects on physical and biological resources were analyzed for these 6 subwatersheds because Federal management standards for these resources were considered more protective than private land management standards. Where lands are conveyed, the risk of adverse cumulative effects increases.

Three of the Subwatersheds have 5% or more of their acres in merchantable timber stands offered for conveyance (Table 120).

Table 120. Subwatersheds Conveying Over 5% Acres with Over 5% in Merchantable Timber

Subwatershed Name	% Merchantable Timber Conveyed	% Merchantable Timber Acquired
Butcher Creek	10.5 %	6.6 %
Bear Creek	20.2 %	0
Upper Deer Creek	12%	0

Butcher Creek Subwatershed

Past, present and foreseeable actions on NFS lands in the SWS include:

> Sheep grazing as a part of the Butcher Creek Allotment is the only past, present, or foreseeable action on NFS lands in the SWS.

The Proposed Action would lead to a net conveyance of about 4% of merchantable timber acres on the SWS. The effect of additional acres of foreseeable logging on private lands would be immeasurable for water yield and peakflow. The potential recipient of these lands has indicated intent to use them for timber production, livestock grazing, and real estate investment. Logging would be subject to the Oregon State Forest Practices Act. Grazing could increase on private land after logging, some effects to ground cover and erosion potential could occur. The Butcher Creek allotment includes the west slope of Butcher Creek. Sheep are on the allotment for 5 weeks in June and July. Sheep are controlled by the presence of a herder and effects to the water quality of the SWS are negligible and would not cumulate with foreseeable timber harvest on private lands.

Bear Creek Subwatershed

Past, present and foreseeable actions on NFS lands in the SWS include:

> Continued grazing of the Round Top and Dixie allotments in the area.

About 20.2% of SWS merchantable timbered acres would be conveyed in the proposed action. No change would occur in grazing standards due to the exchange. Therefore, no changes in existing aquatic conditions would occur. Because there would be no incremental effect of the proposed action from grazing system changes, there would be no cumulative effects from grazing.

Upper Deer Creek Subwatershed

Past, present and foreseeable actions on NFS lands in the SWS include

> Continued grazing of allotments in the area.

About 12% of SWS merchantable timbered acres would be conveyed in the proposed action.

The potential recipient of these lands has indicated intent to use them for timber production and livestock grazing. Logging would be subject to the Oregon State Forest Practices Act. Grazing could increase on private land after logging, some effects to ground cover and erosion potential could occur.

Five or more percent of SWS acres would be conveyed in 3 other Subwatersheds. In these SWS, merchantable timbered acres would be less than 5%.

Table 121. Subwatersheds Conveying Over 5% Acres With Less Than 5% in Merchantable Timber

Subwatershed Name	% of SWS Conveyed	% of SWS Acquired
Big Sheep/Carrol Crk	6.7 %	
Lower Mud Creek	8.6 %	3.6 %
Snipe	5.0 %	

Big Sheep/Carrol Creek Subwatershed

Past, present and foreseeable actions on NFS lands in the SWS include:

> Grazing of the Divide, Carrol Creek, and Big Sheep cattle allotments will continue to be authorized. At the same time, private landowners will continue to graze their portions of the watershed with cattle and horses.
>
> The 1999 Carrol Creek Fire burned approximately 1920 acres. A fire salvage and restoration project was initiated in 2000. This project included helicopter salvage on 441 acres, decommissioning of 7.2 miles of road, and reforestation and seeding of 330 acres. All salvage and restoration activities were completed by 2002.

About 6.7% of SWS acres would be conveyed, less than 5 % are forested. The effect of foreseeable logging when added to burned acres (about 11% of the SWS total over 10 to 15 years) would be immeasurable for water yield and peakflow. Ground cover on burned acres has recovered and erosion and sedimentation effects have decreased to near pre-burn levels. Conveying the parcels to private ownership is unlikely to result in changes in grazing intensity; therefore, no change in aquatic conditions is anticipated. Because there would be no incremental effect of the proposed action from grazing system changes, there would be no cumulative effects on aquatic resources from grazing.

Mud Creek – Lower Mud Creek Subwatershed

Past, present and foreseeable actions on NFS lands in the SWS include:

> Grazing of the North Powwatka and Buck Creek cattle allotments will continue to be authorized. At the same time, private landowners will continue to graze their portions of the watershed with cattle and horses.

About 8.6% of the SWS would be conveyed, less than half of which is timbered. About 4.6% of the SWS would be acquired. The net change in ownership would be about 4% of SWS acres conveyed into private ownership, about 3% with merchantable timber. The effect of additional acres of foreseeable logging on private lands would be immeasurable for water yield and peakflow. Grazing could increase on private land after logging, some effects to ground cover and erosion potential could occur. However, the parcels to be conveyed are steep and have not been previously assigned to an allotment. Conveying the parcels is not likely to result in an increase in grazing intensity or effects on aquatic resources because cattle are attracted to flatter terrain. Because there would be no incremental effect of the proposed action from grazing system changes, there would be no cumulative effects on aquatic resources from grazing.

Snipe Subwatershed

Past, present and foreseeable actions on NFS lands in the SWS include:

> About 200 acres of this subwatershed were harvested in 1990.
> The Lucky Strike allotment would continue to be grazed.

Five percent of the acres in this subwatershed would be conveyed, about 3% of which have merchantable timber stands. The effect of harvest, including existing NFS harvest and additional acres of foreseeable logging on private lands would be negligible for water yield and peakflow. Grazing could increase on private land after logging, some effects to ground cover and erosion potential could occur. These parcels have been grazed as a part of the Cooper and Hutchinson allotments under term grazing permits with on/off provisions. Stocking levels of 62 and 18 AUM respectively have been acceptable to the permit holder in the past, and it is assumed by agency range managers that grazing systems would continue to be grazed under the current system. Because there would be no incremental effect of the proposed action from grazing system changes, there would be no cumulative effects on aquatic resources from grazing.

The previous analysis of cumulative effects on aquatic resources was completed for the Proposed Action (Alternative 1). Alternative 2 would result in no changes in ownership patterns and would therefore cause no changes in aquatic resources related to land exchange and therefore, no cumulative effects. As described in the direct and indirect effects for Hydrology, Wetlands, and Floodplains, Alternative 3 only acquires parcels and would have no adverse effect on aquatic resources related to parcel conveyance. Therefore, no incremental adverse effects would result from implementing Alternative 3, and there would be no adverse cumulative effects on aquatic resources. Alternative 4 would temper any adverse effects on aquatic resources from parcel conveyance by instituting deed restrictions. Refer to the direct and indirect effects for Hydrology, Wetlands, and Floodplains earlier in this chapter. Any potential cumulative effects from Alternative 4 would be even less than described for Alternative 1.

Fisheries & Wildlife

Cumulative effects are addressed to the extent practicable in the Fisheries and Wildlife Effects Analysis. Following is a summary of the cumulative effects by species or habitat as discussed in the Effects Analysis. The Effects Analysis often combines “indirect” and “cumulative” effects because they are not easily separated for a project of this nature, scale, and geographically scattered pattern. Cumulative effects result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. Also, cumulative effects must overlap in time and space. For the purpose of this cumulative effects discussion, existing conditions are considered equivalent to “past” actions, and anticipated actions on private lands (based on private landowners’ questionnaire responses, and observed patterns) and projections about management on public lands (based on existing Forest Plans and other applicable laws) can be considered “reasonably foreseeable” actions. Very few current actions other than this land exchange constitute “incremental impacts” that are practicable to analyze with a reasonable degree of certainty.

Old Growth Habitat

Alternative 1 will contribute cumulatively to a reduction in old growth habitat in a landscape that is already recognized as deficient in old growth. The conveyance and subsequent logging of old growth parcels will have localized negative effects by displacing individual animals at the sub-watershed scale for the long-term. “Interim Protection for Late-Successional Forests, Fisheries and Watersheds: National Forests East of the Cascade Crest, Oregon and Washington” was compiled in 1994 by the Eastside Forests Scientific Society Panels representing The Wildlife Society, The Ecological Society of America, Society for Conservation Biology, American Ornithologists Union, and American Fisheries Society. The executive summary states that “present levels of late-successional/old growth forest on the Eastside fall far below historic levels, particularly in lower-elevation forests dominated by ponderosa pine, western larch, and Douglas-fir. Only about 20-25% of remaining old growth is now protected administratively or by statute (from 8% in Wallowa-Whitman NF to 32% in Deschutes NF). From 70 to 95% of the old growth patches that remain cover less than 100 acres each – too small to provide for the basic needs of many old growth-associated species” (Karr et. al. 1994, page 5). This report goes on to recommend no logging of old

growth forests in eastern Oregon and Washington. “The significantly reduced area, fragmentation, and degraded condition of eastside late-successional/old growth forests caused by past logging and road construction threaten many forest and aquatic species. These impacts and consequent loss of critical aquatic and terrestrial habitats – have significantly diminished the region’s ability to absorb and buffer disturbances, thus leading us to conclude that all remaining old growth blocks and fragments are ecologically significant” (Karr et. al. 1994, page 7).

The watersheds that would experience the greatest negative effect to old growth associated wildlife are: 1) Lower North Fork John Day River (parcels FM 15 through FM 21); 2) Upper Butter Creek (FU 21); and 3) Meacham/Butcher Creek (FU 3A, FU4).

The loss of dedicated old growth for Alternative 1 is 493 acres, which is about 0.3% of the total acres of dedicated old growth on the three National Forests. The net loss of LOS habitat is 1,508 acres, which is about 0.9% of the total acres of dedicated old growth habitat estimated by the Forest Plans in Decade 2 (currently) (table 122). As individual watersheds have experienced departure from HRV, some species have been locally eliminated, contributing to poor distribution, low interchange of genetic material, and increased vulnerability to catastrophic events as animals were forced into smaller and more isolated islands of suitable habitat. Current vegetation management activities on FS lands are geared toward returning to the HRV; thereby restoring habitat for many species in Families 1 and 2 over time. The conveyance of parcels containing LOS would have localized negative effects by displacing individual animals, and reducing the geographic extent to which some species can persist at the watershed (fifth level HUC) scale. For example, parcels FM15 – FM21 on the “North Finger” of the Blue Mountain Ranger District, parcels FU3A – FU4 in the vicinity of Meacham and Butcher Creeks on the Walla Walla Ranger District, and parcel FU21 on the North Fork John Day Ranger District represent the largest, most contiguous areas of LOS that are locally important for old growth associated wildlife in this project.

North Finger (Hamilton Ridge): The conveyance of the North Finger parcels would effectively reduce the western extent of old growth habitat along a relatively narrow band of conifer forest running east and west. Conveying the North Finger parcels would also have a negative effect on the spacing of dedicated old growth areas. The North Finger old growth provides the only interior old growth habitat in the vicinity. Interior conditions refer to forested patches that have an edge to area ratio low enough to alleviate effects from edges. Meaning that edge effects (wind, temperature, relative humidity, sunlight, etc.) reach equilibrium, thereby providing conditions favored by goshawks and other old growth associated wildlife species (Harris 1984). The old growth habitat being conveyed on Hamilton Ridge is expected to be logged within 10 years. Once logged, these parcels will be unsuitable for old growth associated wildlife, an effect that will persist into the long-term.

Alternative 1 may negatively affect three goshawk nests. Conveyance of FM15 and FM17, or any of the North Finger parcels (FM15-FM21) would severely reduce the ability of goshawks to continue reproducing in this part of the Blue Mountain Ranger District once logging reduces canopy closure, large tree, snag and log densities, overall prey base habitat and potential nesting structures. The LOS habitat on parcels FM15-21 currently provides the highest quality foraging habitat, the most likely dispersal areas for fledglings, and the highest quality nesting options for alternate nests.

Meacham/Butcher Creek: The conveyance of the Meacham/Butcher Creek parcels would result in fragmentation and reduction of LOS habitat. This would reduce the capacity of the Butcher Creek drainage to support goshawk, marten, pileated woodpecker, and other old growth associated species. Once logged, these parcels will be unsuitable for old growth associated wildlife, an effect that will persist into the long-term.

Parcel FU21 (Upper Butter Creek): Conveyance of parcel FU21 would result in a long-term reduction of multi-strata old growth in an area that is deficient in this type of habitat.

Cumulative effects would be minimal beyond the indirect effects discussed above since very little LOS currently exits on private property to be logged, and LOS on FS lands are essentially off limits to logging. A more detailed discussion of how Alternative 1 affects HRV is found on pages 11-13 of Diskin's Upland Vegetation report.

The important findings in Diskin's HRV analysis is that all watersheds affected by Alternative 1 would continue to be deficit in LOS relative to the HRV mid-point for MSLT and SSLT combined, except for the dry upland forest category in Big Sheep and Birch Creeks, and the cold upland forest category in Rhea Creek. The PR contains figures on the amount of change in LOS by watershed that would result from Alternative 1. The watersheds that would experience the greatest negative effects to old growth associated wildlife are: 1) Lower North Fork John Day River (parcels FM15-FM20); 2) Upper Butter Creek (FU21); and 3) Meacham/Butcher Creek (FU3A-FU4).

Table 122. Estimates of old growth habitat acres from Forest Plans, Decade 2. (acres)

	W-W NF	Umatilla NF	Malheur NF	Total
Wilderness	67,000	68,900	35,239	**171,139**
Dedicated Old Growth Areas[1]	59,789	44,170	65,985	**169,953**
Other Areas	60,000	51,400	50,350	**161,750**
Total	**186,789**	**164,470**	**151,574**	**502,833**

1) These acres are from the three Forests' geographic information system data on land allocations.
Old growth is defined as areas functioning as habitat of old growth associated species, collectively LOS and dedicated old growth.
Other areas are defined as other old growth outside of dedicated Forest Plan old growth, not within the wilderness management area prescription.

Another way to evaluate old growth habitat is to look at "total" old growth at the Blue Mountain landscape scale. Currently there is no accurate estimation of existing total old growth in the Blue Mountains. However, table 122 indicates that up to 502,833 acres of old growth habitat was estimated to exist in the second decade (current conditions) from all 3 Forest Plans. The wilderness and "other areas" acreages in table 122 are estimates from the Forest Plans, and the acreages for dedicated old growth come from current geographic information system data. However, it is important to recognize that the acreage figures in table 122 over estimate the actual old growth habitat that currently exists since a large number of dedicated old growth areas and much of the wilderness areas do not contain functional old growth habitat. Alternative 1 represents a 1,508-acre net loss in LOS, which is about 0.4% of the total acres of old growth (dedicated old growth plus "Other Areas" not including Wilderness in Table 122) estimated in the 3 Forest Plans.

In cases where dedicated old growth is conveyed suitable replacement old growth areas are available nearby on the Wallowa-Whitman and Umatilla National Forests to meet forest plan requirements for replacing dedicated old growth areas that are conveyed in an exchange. The identified replacement areas for the Malheur National Forest represent the best options, but do not meet minimum requirements in the Malheur LMRP for old growth components.

Alternatives 2 and 3 – Cumulative effects of these alternatives would involve the logging of 697 acres of LOS on private land within the next 10 years. The typical logging prescriptions on private lands in northeast Oregon do not retain old growth stand characteristics, and often perpetuate early to mid-successional conditions in perpetuity. The 2,205 acres of LOS that remains under FS management would likely not be logged and would continue to function as LOS until policy regarding old growth changes or

a disturbance (fire, disease, etc.) sets back succession in these stands. The LOS and dedicated old growth on the North Finger, Meacham/Butcher Creek and parcel FU21 would be retained in FS ownership and managed for their old growth values. These alternatives would have the least negative effect to LOS of all the alternatives. These alternatives would not contribute to a further departure from HRV for LOS habitat. These alternatives would have the least negative effect on declines of source habitats for Families 1 and 2.

Cumulative effects to LOS from these Alternatives are limited to the future logging of LOS from private lands that would not be acquired (697 acres), and past logging activities that have created the fragmented, deficient LOS situation that currently exists.

Alternative 4 - The more substantial stream buffers and retention of larger trees pose a slightly less negative effect than Alternative 1, but the difference is negligible when considered in the context of species viability for marten, pileated woodpecker, goshawk, and three-toed woodpecker. There would be 284 fewer acres of LOS acquired by the FS and subsequently managed for old growth values with this Alternative. These 284 acres would likely be logged, resulting in less available habitat for the old growth wildlife community, even though >21" diameter trees would be retained. Alternatives 1 and 4 would essentially have the same effects to LOS habitat in terms of habitat suitability reduced from logging of LOS in private ownership, and the effects would persist into the long-term (greater than 50 years).

This Alternative would result in nearly the same degree of departure from HRV as Alternative 1, with the exception of the minor amount of LOS retained in riparian buffers, the occasional (too few to quantify) single-strata stands that would not be economical to log due to the restriction on removal of 21" d.b.h. trees, and the 284 acres that would remain under private ownership and subsequently logged.

Cumulative effects would be minimal beyond the potential effects discussed above since very little LOS currently exits on private property to be logged, and logging of LOS on FS lands is largely prohibited by current regulations.

Rocky Mountain Elk

Alternative 1 - The cumulative effects of this alternative could result in more efficient management of big game ranges where FS boundaries are consolidated; making planning, project implementation, and monitoring more easily accomplished.

Alternative 1 includes the following parcel groupings that would be a benefit to elk habitat management: Powwatka Ridge/Wildcat Creek; Imnaha River North; Imnaha River South; Swiss Flat, NF John Day River /Bridge Creek; and Bear Creek/Hall Creek. The effect of these groupings being exchanged would be an improved ability by ODFW and FS to manage habitat, elk distribution, and hunters.

Alternative 1 also includes the following parcels or groupings that would complicate management of elk habitat or lead to habitat degradation from accelerated logging: Meacham/Butcher Creek; Coalmine Hill; and North Finger/WF Deer Creek. The effect of these groupings being exchanged would contribute to poor elk distribution, a loss of important cover stands, and reduced public access for viewing and hunting elk.

The FS would acquire approximately 101 miles of road and convey about 60 miles, for a net increase of 41 miles. This amount of road in a scattered distribution does not represent a measurable effect in regard to elk habitat.

Cover provided by mid and late seral forest structure would likely be reduced to forage (less than 40% canopy closure) on lands conveyed to private ownership as indicated by the private participants' surveys

and past practice. Alternative 1 could result in reductions in cover within the next 10 years over an estimated 9,615 acres.

Changes to livestock grazing will be minimal and likely negligible relative to elk habitat. See the Range Report for detailed changes to allotments and stocking.

Alternative 2 - By continuing the current ownership patterns, Alternative 2 does not address the Purpose and Need of consolidating Federal ownership to provide for more efficient management of National Forest System lands. Elk that currently reside on private lands would continue to be largely unavailable to the public for hunting and viewing. Cover on private lands would continue to be reduced through logging. The FS does not have data on levels of timber harvest for adjacent private lands, and only considers these effects as practicable. The large majority of forested private parcels has been logged and functions as forage for elk, conditions that would likely exist in perpetuity.

Alternative 2 will retain the following important elk habitat areas in public ownership, which allows for management efficiency, increases the probability of habitat enhancements and restoration, and provides access to the public for hunting and viewing of elk: Meacham/Butler Creek (FU2-5); Coalmine Hill (FU26); and North Finger/WF Deer Creek (FM15-20). This alternative would also keep the following important elk habitat areas in private ownership, which complicates landscape scale habitat management plans and access by the public: Imnaha River South (PW24A-E, PW25, and PW27); Imnaha River North (PW1-23); Meacham/Butcher Creek (PU5-12); NF John Day River/Bridge Creek (PU16A-H); and North Finger (PM23-24).

The following public land parcels would remain in public ownership, which perpetuates problems associated with managing small, isolated land parcels: Swiss Flat (FU6-14, FU19-24, and FU30) and Bear Creek/Hall Creek (FM4-10).

Road densities would remain unchanged. Currently 43 sixth level subwatersheds exceed the threshold of 2.5 miles per square mile typically recognized as an upper limit for road densities in habitat managed for elk.

Alternative 3 - Cover would continue to be reduced on approximately 8,824 acres of private lands that would not be acquired under Alternative 3. Approximately 791 acres of cover acquired by the FS would continue to function as cover and contribute to a desirable distribution of elk herds. These acquired acres would be eligible for treatments (logging) in the future, but elk cover and habitat effectiveness would be management considerations in future plans to change the cover/forage arrangement. These cover stands are more likely to continue functioning as cover under FS management than under private ownership.

Changes to access by the general public would be relatively minor with this Alternative. The FS would gain eight additional miles of road and would not convey roads. These changes are too small to represent a measurable change in road densities that would be meaningful to an analysis of elk habitat.

Alternative 4 - Alternative 4 would result in an estimated 6,649 acres of cover coming under FS stewardship, and would be managed with elk habitat as a primary consideration. Left in private ownership these acres of cover would be converted to foraging areas within 10 years following the exchange. However, 9,231 acres of cover would be conveyed to private resulting in a potential net decrease in cover of 2,582 acres. These changes are negligible at the Blue Mountains scale, but could have detrimental effects at the local scale.

The following parcel groupings are proposed in Alternative 4 and would increase management efficiency, positively influence elk distribution, and improve the public's access to elk on public lands: Powwatka

Ridge/Wildcat Creek; Imnaha River North and South; Swiss Flat; NF John Day River/Bridge Creek; and Bear Creek/Hall Creek.

The following parcel groupings are part of Alternative 4 and would decrease management efficiency of elk habitat, perpetuate poor elk distribution, and decrease the public's access to elk on public lands: all FS parcels and a portion of the private parcels in the Meacham/Butcher Creek grouping; Coalmine Hill; and North Finger/WF Deer Creek (all FS parcels would be conveyed, but neither of the private parcels would be acquired).

Alternative 4 would acquire approximately 53 miles of roads and would convey about 60 miles, for a net reduction of around 7 miles of road. These changes in road densities are negligible in terms of effects to elk habitat. There would generally need to be concentrated changes of road miles in specific watersheds before a measurable change in road densities would occur, which is not the case in this Alternative.

Canada Lynx

Alternatives 1, 3 & 4 - Alternatives 1 and 4 would result in a 125 acre net increase of lynx habitat (foraging and denning combined) and a net increase of 32 acres in alternative 3 that would come under the management authority of the FS. These are additional acres would be analyzed and managed to the standards outlined in the LCAS. Also, any projects planned in or around these FS lands would be subject to oversight through public scoping as part of the NEPA process, and through the consultation process with US Fish and Wildlife Service. There is no requirement of private landowners to consider lynx habitat in management of their lands.

There is little reliable information that allows for an analysis of reasonably foreseeable actions that could contribute to cumulative effects from this land exchange. However, the best and worst-case scenarios for lynx habitat between all action alternatives do not represent a measurable benefit or detriment to lynx or lynx habitat. None of the action alternatives would result in a measurable effect to lynx. This finding is based on: 1) the minute acreages involved over five LAUs; 2) the fact that most of these acres are on the periphery of core lynx habitat; and 3) because none of the lynx habitat involved represent outstanding features or important locations deserving of more detailed consideration.

Alternative 2 - A decision to not proceed with this land exchange would only contribute to cumulative effects in how no change in ownership would affect habitat for lynx. The continuation of current management regimes on private and public lands involved in the exchange would not have an appreciable affect on lynx or their habitat. The current public lands would continue to be considered part of the larger LAU, and managed to standards set fourth in the LCAS. The minor acreages of lynx habitat on private lands would likely be maintained in unsuitable conditions through logging as long at they remain in private ownership, except for PW35A-C and PW37 for the reasons stated above.

If all private lands containing lynx habitat in this project were logged to the greatest intensity allowed by state law, the cumulative effect to lynx would be negligible. The cumulative effect of continuing to manage for lynx on the FS parcels would not contribute appreciably to the conservation and recovery of lynx.

Bald Eagle

Alternative 1 - The Dry Creek nest tree is very near the border of parcel PU26B, and 0.25 miles from PU26A. These parcels have been heavily logged and will not provide suitable structures for roosting, nesting or perching for several decades. Acquisition of PU26A and PU26B would allow their inclusion into a nest site management plan for this site. A nest site management plan would go into much greater depth than a typical written plan submitted to ODF by a private party as required by the Oregon Forest

Practices Act when logging is proposed near a nest or roost. However, parcels FU27 and FU28 are less than 0.75 miles from the Dry Creek nest and represent the best quality replacement habitat in case the existing nest stand is lost (fire, wind, insects, trespass logging, etc.). FU27 and FU28 are contiguous with other FS land and contribute to the long-term viability of nesting bald eagles in this vicinity. These parcels would likely be logged following conveyance, and they are far enough away from the Dry Creek nest to not be subject to requirements of OARs for bald eagle nests.

This alternative would improve management options for this nest in the long-term through acquisition of PU26A and PU26B, but potentially important replacement bald eagle resources would be lost on conveyed parcels FU27 and FU28.

The three roost sites within a mile of parcels would be protected in the short-term (estimated 20 years) whether this proposed exchange occurs or not. OARs protect roosts on private land and the Endangered Species Act protects those on FS lands. The only difference between protections afforded roosts on private verses FS ownerships is that long-term protection is more likely under Federal ownership since OARs do not provide for replacement roosts in case existing ones are lost.

There are no FS timber sale operations in the vicinity of the Dry Creek nest or the Bear Creek, Horse Canyon or Wenaha River roosts that would contribute to cumulative effects of this land exchange. Ongoing recreation, road maintenance, and fire suppression activities are considered in the management of known bald eagle sites and will not contribute to adverse cumulative effects of this proposed exchange.

Alternative 1 would be negligible in terms of short-term effects to known bald eagle sites. There would be a potential long-term effect in losing replacement nest and roost trees on parcels FU27 and FU28. However, this potential negative effect would not likely be important enough to influence the rate at which recovery goals are achieved in Management Zone 9.

Alternative 2 - Oregon Administrative Rules apply to eagle sites on private lands, and are designed to protect known bald eagle resource sites (nests, roosts, perch trees, staging trees, etc.) from disturbance and destruction. The only known eagle nest that could be affected by future management within a mile of a land exchange parcel is the Dry Creek nest (628). The OARs would continue to apply to any management actions on parcels PU26A and PU26B. These regulations are generally accepted as adequate to protect eagle resource sites, at least in the short-term (20 years). The long-term viability of this eagle resource site is unknown under the current OARs because the focus of the OARs is on protecting existing nests and does not project future needs in case a nest is lost. PU26A and PU26B have been heavily logged and will not be capable of supporting an eagle nest or roost for several decades. Parcels FU27 and FU28 represent the closest and best quality habitat capable of supporting nesting or roosting bald eagles should the Dry Creek nest stand be lost. These conditions are likely to persist into the long-term if FU27 and FU28 remain in public ownership.

There is a slight chance that some potential replacement roost, perch or nest trees could be lost to logging on PU16F if the parcel remains in private ownership, but the risk to eagles would be low. This low risk is based on the location of the highest quality roost trees within a riparian management area for a “large, type F” stream (North Fork John Day River). Also, ample options for roosts, perches and nest trees exist along the NF John Day River, many of which are located on FS and ODFW lands.

FM10 contains some suitable replacement roost trees if the Bear Creek roost were to be lost. The Bear Creek roost is located on BLM land and receives the same considerations under the Endangered Species Act as it would if it were located on FS land.

Alternative 2 would be negligible to the viability of bald eagles in Management Zone 9 in the short-term (20 years). The retention of FU27, FU28, and FM10 in FS ownership would be positive for the long-term

viability of known bald eagle sites, but would not likely be important enough to influence the rate at which recovery goals are achieved in Management Zone 9.

Alternative 3 - The minor positive effects of PU16F coming under public ownership would be immeasurable in regard to viability of the Horse Canyon roost and to the welfare and recovery of bald eagles in Management Zone 9. Otherwise the effects of this alternative are the same as for Alternative 2 (no action).

Alternative 4 - The potential effects to bald eagles are similar between Alternatives 4 and 1. The differences are as follows.

The deed restrictions placed on FU27, FU28, and FM10 would prohibit the logging of green trees $\geq$ 21" d.b.h. This would retain the larger, most suitable trees for future replacement of roosting, nesting, and perching trees that are lost.

Parcel PU16F would be acquired by the FS, but this would mean little to no difference in how the Horse Creek eagle roost is managed. The Horse Creek roost is on the south side of the North Fork John Day River, on private property within a "Large, type F" riparian management area, and further protected by the OARs regarding bald eagle roosting resource sites. This site is identified in a Resource Management Plan for the private property containing the roost.

Parcel PU1B would not be acquired by the FS. There would be no difference in potential effects between all alternatives for the Wenaha Roost because PU1B is nearly one mile from the roost and FS and ODFW lands surround the roost. ODFW is the current owner of PU1B and this agency is aware of and sensitive to the needs of eagle roosts.

Parcels PU26A and PU26B would not be acquired by the FS in this alternative. The Dry Creek nest would likely receive similar short-term protection (20 years) whether PU26A and PU26B remain private or become public. However, long-term viability of the nest through retention of replacement nest trees would not be ensured if FU27 and FU28 are conveyed.

Mid-Columbia and Snake River Steelhead

Alternative 1- The net increase in steelhead habitat coming under FS management would lead to improvements in fisheries habitat through correction of point sources for sediment from poorly designed/located roads, improved livestock grazing practices near streams, and wider stream buffers in logging areas. These positive effects would represent minor contributions to recovery of steelhead habitat at the Ecologically Significant Unit (ESU) scale, but could result in greater hatching rates and fingerling survival in specific streams that involve higher levels of streams being acquired by the FS. An example would be the Imnaha River (Upper, Middle, and Lower Imnaha) that involves a total of 18.7 miles of steelhead habitat that would be acquired.

Subwatershed 170701030203 in Butcher Creek watershed would convey 10.5% of its area and 6.6% of its area would be acquired. Subwatershed 170702010803 in Bear Creek watershed would convey 20.2% of its area and none would be acquired. Subwatershed 170702021001, Upper Deer Creek in the Lower North Fork John Day River watershed would convey 12% of its area and acquire 1.4% of its area. These three subwatersheds represent the greatest potential for negative effects to steelhead from this land exchange. The potential for negative effects comes from appreciable percentages of subwatersheds going to less protective management standards.

Fifty-six miles of road within 300' of streams will be acquired by the FS in this alternative, offering the greatest opportunity for restoration or mitigation of road effects to water quality. Not all of these roads are

adjacent to steelhead habitat, but total miles of road within 300' of streams provide a good index to compare with other Alternatives.

Alternative 2 - The indirect effects of not exchanging the proposed parcels are related to forgone opportunities to consolidate ownership boundaries that would increase management efficiencies on public land relative to steelhead habitat. The no action alternative would also forego an opportunity to acquire approximately 37 miles of steelhead habitat. Under FS management these miles of steelhead habitat would be held to higher environmental standards, monitoring of habitat and fish populations would be more likely to occur, and restoration needs would be addressed in a timelier manner.

These missed opportunities to improve management on 37 miles of steelhead streams represent discountable negative effects when considered at the ESU scale for either the Snake River or Mid-Columbia ESU. The actual effects to fish habitat that could occur in the future are those that would have likely occurred even if this exchange had not been proposed. Cumulative effects of increased sediment to streams from poorly maintained/designed roads, intensive livestock grazing and holding facilities near streams, and logging to Oregon Forest Practices Act standards would continue. These possible effects can be significant at localized scales, but are generally not measurable at the fifth level HUC scale.

Fifty-six miles of road within 300' of streams would remain under private ownership, preventing the FS from addressing site-specific problems with culverts and sediment sources.

Alternative 3 - There may be improvements in steelhead habitat conditions on 9.27 miles of stream following acquisition, but these positive effects would be miniscule relative to the ESU scale and would likely not be realized in increased survival or production of steelhead.

Logging of approximately 8,824 acres of merchantable private forestlands would continue on parcels not acquired in this alternative. These acres would be subject to the less protective stream buffers of the Oregon Forest Practices Act. Although steelhead streams in these 8,824 acres of forestlands would likely be protected from direct effects from logging, there would be less protection from unexpected events that can compromise or invalidate narrow stream buffers. Wildfire, insects, disease, wind, and floods are more likely to compromise a narrow stream buffer than a wider one.

Five and a half miles of road within 300' of streams would be acquired with Alternative 3. The opportunities for stream restoration (related to roads) and mitigation of road effects to water quality are minimal with this Alternative. The small scale of potential improvements to roads in this Alternative is discountable relative to steelhead.

Alternative 4 - One important difference between Alternatives 4 and 1 is the fact that all conveyed lands would be managed the same as FS administered lands in regard to streamside habitat. PACFISH/INFISH buffers would apply to logging projects, livestock grazing would be restricted in spawning habitat during critical periods to protect redds and emerging fish, and livestock grazing standards and monitoring requirements would match those required for FS lands. These requirements would be accomplished through deed restrictions, essentially protecting fisheries to the same level as on public lands.

Alternative 4 would acquire 33.2 miles of road within 300' of streams, representing opportunities to repair or obliterate roads that are having a negative effect to fisheries or water quality.

Mid-Columbia and Snake River Chinook salmon

Alternative 1 - The acquisition of nearly 16 miles of Chinook habitat holds potential for improved management by the FS through more protective standards for forest, range and road management. These

improvements could result in increased fish production as degraded riparian habitat recovers, fish passage is restored, livestock is excluded from spawning habitat, and upland forests are restored.

Alternative 2 - This alternative would perpetuate existing conditions that could negatively affect Chinook production and survival in the Imnaha River. These conditions include, but are not limited to: cattle handling corrals in RHCAs, noxious weeds in uplands and RHCAs, culverts that pose barriers to fish movement, minimal riparian buffers in forested areas, and cattle grazing in spawning habitat while Chinook are present. Although these conditions and potential risks would persist with this Alternative, they would have had the same effect had this land exchange not been proposed. Therefore, Alternative 2 perpetuates the existing condition for Chinook habitat.

Alternatives 3 & 4 - All parcels conveyed by Alternative 4 (none contain Chinook habitat) would have a deed restriction that would apply FS standards to all streams. These deed restrictions essentially result in no change in regard to Chinook habitat on conveyed parcels. Potential positive effects would result from 9.85 and 15.70 miles of habitat being acquired for Alternatives 3 and 4 respectively. Although no Chinook habitat would be conveyed, improvements in management of upstream habitat from acquired parcels could result in a slight positive effect to Chinook habitat. This positive effect would not likely result in improved survival of Chinook salmon, but would contribute to a trend toward improved habitat conditions.

Bull Trout

Alternative 1 – The addition of nearly 13 miles of bull trout habitat to FS management would likely have minor beneficial effects to bull trout through improved management of roads, upland forests, and livestock grazing. The amount of habitat improvement would likely not be great enough to increase fish production or survival of juvenile fish. Alternative 1 and 4 would have similar effects and represent the greatest potential for improvements to bull trout habitat of any of the alternatives.

Alternative 2 – This alternative would forego an opportunity to improve management on nearly 14 miles of bull trout habitat. Merchantable timber is expected to be logged from private lands not conveyed. This is most important to consider for the subwatersheds that involve >5% of their area in the proposed exchange. FS parcels in Butcher Creek, Bear Creek and Upper Deer Creek subwatersheds would be retained by the FS, while merchantable timber would likely be logged on private parcels in Dry Gulch, Butcher Creek, Bark Cabin Creek, and Texas Bar. See effects to water quality, riparian condition, and water yield in the Hydrology section.

Alternative 3 – A total of nearly nine miles of bull trout habitat would come under a more protective management regime, which could lead to slight increases in riparian habitat recovery. The minor amount of recovery that would occur on these streams (mostly FMO habitat) would be too small to increase fish production or survival of juvenile fish. The beneficial effects of this Alternative are greater than Alternative 2, but less than Alternatives 1 and 4.

Alternative 4 - The difference between Alternative 4 and other action alternatives is that deed restrictions would apply to 0.14 miles of FMO habitat, which could lead to improvements in habitat conditions over time. Improvements in habitat would likely be immeasurable because the parcels (FW6C and FU1) involved are very small and contain only five acres each of upland forests. The very corners of six other conveyed parcels (FW6A, FW6B, FW6D, FW6E, FW6F and FW9) overlap into the RHCA of Big Sheep Creek, but do not actually involve exchange of stream habitat. Page 2 of the Hydrology Effects Analysis documents that these parcels include "…small segments of floodplain associated with seasonally wet meadows, ….are less than 20 feet wide and located in remote areas with little development pressure". Deed restrictions on these parcels would have immeasurably minor positive effects to bull trout. Even

with the minor differences discussed, Alternatives 4 and 1 would have the same beneficial effects to bull trout and a discountable risk of negative effects.

Fisheries Summary

Table 123 lists the watersheds discussed in the Watershed cumulative effects section and miles of habitat by species being acquired (+) and conveyed (-). At least one percent of the area of these watersheds are either conveyed or acquired in Alternative 1. Watersheds that involve less than one percent of their area in this proposed exchange are not included in this table.

The Hydrology, Wetlands, and Floodplains section in this cumulative effects analysis discusses all of the influences that have potential to affect fisheries habitat. Therefore, in addition to the above effects related to miles of habitat being exchanged, other pertinent effects to fisheries can be found within the Hydrology, Wetlands, and Floodplains section.

Table 123. Summary of Fisheries Habitat in Alternative 1 for Watersheds that include 1% or more of their Area in the Exchange

Watershed	Total Acres	Acres Conveyed	% Conveyed	Acres Acquired	% Acquired	Fisheries Habitat Involved (miles)		
Lower Snake Basin						**Sth**	**BT**	**Ch**
M. Imnaha R.	87,946	244	0.28	1,274	1.45	+3.87	+4.42	+3.83
Big Sheep Cr.	88,975	1,348	1.50	261	0.29	+1.59 -0.17	-0.90	+1.03 -0.08
L. Imnaha R.	147,098	452	0.31	6,641	4.51	+10.41	+4.53	+6.00
Meadow Cr.	115,909	388	0.33	241	0.21	+1.52 -0.66	0	+0.35
Grande Ronde R/Five Pts. Cr.	87,882	9	0.01	36	0.04	0	0	0
U. Wallowa R.	157,739	409	0.26	481	0.30	0	0	0
GR River/Mud Cr.	154,048	1,788	1.16	1,034	0.67	0	0	0
Chesnimnus Creek	122,640	0	0	1,538	1.25	+1.07	0	0
Meacham Creek	114,078	3,976	3.50	2,671	2.34	+1.76 -2.11	+1.29 -0.05	0
Murderers Creek	84,940	0	0	1,202	1.42	+1.22	0	0
Strawberry Creek	149,722	2,609	1.74	12	0.01	-3.64	0	0
Beech Cr.	70,873	617	0.87	1,800	2.54	+0.08 -0.46	0	0
Laycock Cr.	108,251	0	0	1,428	1.32	+1.15	0	0
NF John Day River/Big Cr.	105,870	0	0	4,064	3.84	+2.06	0	0
L. Camas Cr.	156,989	1,925	1.23	152	0.10	0	0	0
Wall Creek	128,349	0	0	2,246	1.75	+0.93	0	0
L. NF John Day River	117,028	2,389	2.04	405	0.35	-0.25	0	0

Sth – steelhead, BT – bull trout, Ch – Chinook salmon
Minus indicates Conveyed
Plus indicates Acquired