6840P
Date: August 1, 2000

Mike Crouse
Attn: Ron Lindland
National Marine Fisheries Service
Environmental and Technical Services Division
525 NE Oregon St., Suite 500
Portland, Oregon 97232-2737

Dear Mr. Crouse,

Per regulations on interagency cooperation (50 CFR 402) pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (as amended), this letter and the enclosed Biological Assessment (BA) for the Northeast Oregon Assembled Land Exchange constitutes a request to the National Marine Fisheries Service for informal consultation. The enclosed BA documents this proposed action on the Central Oregon Resource Area, Prineville District Bureau of Land Management (BLM) and Baker Resource Area, Vale District BLM, which "may affect" Mid Columbia summer steelhead, which was listed as threatened under the ESA (March 16, 1999).

Effects determinations reached by the Level 1 team are "may affect, not likely to adversely affect (NLAA)" for Phase 1 of the exchange proposal. Effects determinations were analyzed on an individual exchange parcel basis, and on 4^{th} field HUC scale.

Initial consultation/conferencing was initiated with Scott Carlon of NMFS and Gary Torretta of BLM in 1998. Subsequent personnel changes in both agencies required inclusion of Ron Lindland of NMFS and Brent Ralston and John Morris of BLM. Due to an oversight during personnel changeover within the BLM only a partial package of maps and Final EIS were submitted by BLM in the fall of 1999. The actual BA was not sent at this time. Enclosed is a draft of the BA which should have been submitted with the initial package in fall 1999. The exchange proposal in currently undergoing legislation with the U.S. Senate and House of Representatives and has been subsequently passed for Presidential Signature. Phase 1 of the exchange is likely to become law within a short time frame. The BLM takes responsibility for the oversight and subsequent time gap in the consultation process, however, we request that this consultation take priority over other actions the Prineville BLM is currently consulting on. For further information or questions please call John Morris at 541-575-3099 or Brent Ralston at 541-416-6713.

Sincerely,

Dan Tippy
Acting Area Manager
Central Oregon Resource Area

Northeast Oregon Assembled Land Exchange
Biological Assessment

Section 7 Consultation For
Bureau of Land Management
Lands in
Central and Northeastern Oregon

August 2000

Submitted To:
National Marine Fisheries Service
Portland, Oregon

Prepared By:
Gary D. Torretta, Fisheries Biologist
BLM Prineville District, Central Oregon Resource Area
Prineville, Oregon

Table of Contents

Additional Attachments

- The Northeast Oregon Assembled Land Exchange (NOALE) EIS
- Map of May Affect Disposal Parcels

Identification of listed species and proposed critical habitat affected by actions in the section 7 watersheds.

On May 24, 1999 the National Marine Fisheries Service (NMFS) listed the Middle Columbia Evolutionary Significant Unit (ESU) of inland steelhead trout (*Oncorhyncus mykiss*) as "threatened" under the Endangered Species Act (ESA). Steelhead inhabiting the John Day River Basin within the Central Oregon Resource Area of the Prineville District Bureau of Land Management (BLM), and the Umatilla River Basin within the Baker Resource Area of the Vale District BLM, are in the Middle Columbia ESU. The Columbia River bull trout population segment was listed as "threatened" in 1998 by the U.S. Fish and Wildlife Service.

Federal agencies including the Bureau of Land Management (BLM) are required to comply with the ESA Section 7(a)2 - to insure that Federal actions are not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of critical habitat of such species. Within the scope of this Biological Assessment, the BLM will ensure compliance with the ESA for the discretionary action of completing a proposed land exchange.

The inland steelhead ESU occupies the Columbia River Basin and tributaries from above (and excluding) the Wind River in Washington and the Hood River in Oregon, upstream to, and including, the Yakima River, in Washington.

In the John Day River basin, steelhead spawning occurs widely throughout the basin, primarily within tributary streams to the upper main river and its forks. Refer to previously submitted maps for a depiction of occupied steelhead habitat in relation to BLM-managed lands. The John Day River Basin contains approximately 1,800 miles of usable spawning/rearing habitat for steelhead trout, and the basin contains one of last remaining totally wild populations of steelhead trout in the Columbia River Basin. The John Day steelhead population has not been supplemented with hatchery fish.

In the Umatilla River Subbasin, steelhead distribution is distributed widely within the upper tributaries and forks of the main river, and the upper Walla Walla and Touchet River drainages.

Scope

Within the Analysis Area are the following 4th field Hydrologic Units (HU) or subbasins:

- Lower John Day #17070204
- Upper John Day #17070201
- North Fork John Day #17070202
- Middle Fork John Day #17070203
- Umatilla River #17070103

The John Day Basin encompasses about 5.1 million acres of an extensive interior plateau between the Cascade Range and the Blue Mountains in northeast-central Oregon. Most of the basin is privately owned (3.2 million acres). National Forest lands encompass about 1.53 million acres, and about 424,700 acres are managed by the BLM. Oregon Department of Fish and Wildlife (ODFW), National Park Service, Oregon State Land Board, Oregon Forestry Department, and the Corps of Engineers manage about 57,000 acres. Predominate management activities in this watershed are agriculture, grazing, timber, and recreation.

The Umatilla River Basin encompasses about 1.5 million acres across the Umatilla Plateau in northeastern Oregon. Elevations range from 270 feet at the Columbia River to about 6,000 feet. Most of the basin is privately owned (51%). About 37 percent of the basin is managed by Federal agencies, primarily the U.S. Forest Service. The BLM is a minor land owner in the basin, managing less than 2% of the land base.

Table 1 shows total acres, and Prineville District BLM managed lands within each 4th field Hydrologic Unit.

Table 1. **Subbasins in the John Day Basin.**

Subbasin Name	**Total Acres**	**Prineville District BLM Managed Acres**
Upper John Day	1,375,000	152,890
North Fork John Day	1,187,000	39,472
Middle Fork John Day	504,500	3,975
Lower John Day	2,011,000	228,391

Project Description

Introduction

The purpose of this analysis is to address facilitation of multiple land exchanges by identifying a pool of public lands for potential disposal (exchange), discussing potential acquisition areas, and analyzing how this proposal may affect Middle Columbia steelhead trout and its habitat. Normally more BLM-administered lands are identified for exchange analysis than is necessary to equal the value of potential acquisition lands. This provides a buffer to still accomplish an exchange when certain public tracts containing significant resource values (cultural, paleontological, Threatened and Endangered Species, etc.) are removed from the disposal list.

Land tenure adjustments in northeast and central Oregon have been discussed for many years. The need to improve management efficiency through consolidating BLM's land ownership patterns was identified in the John Day Resource Management Plan (RMP) of 1984, its Record of Decision (ROD) of 1985, and a subsequent RMP Amendment in 1994. Exchanges analyzed in the Northeast Oregon Land Exchange

(NOALE) would implement most land tenure adjustments discussed in the John Day, Two River, and Baker RMPs.

BLM-managed lands on the Prineville and Vale Districts are scattered across many counties, with little continuity, with some exceptions. Small scattered tracts are difficult and inefficient to manage and typically have more instances of trespass violations. Little staff time and resources are allocated to these tracts, because higher priority is set on large land blocks where management plans can be more effectively implemented.

Somewhat blocked and consolidated public lands are located along the lower John Day River corridor below Clarno (RM109-29), the Sutton Mountain area near Mitchell, Oregon, uplands west of Rudio Mountain, (RM 185-207), and the South Fork John Day watershed (RM 9-36) between the Ochoco and Malheur National Forests. The public would benefit substantially by repositioning the land values from scattered tracts into large blocks of acquisition lands that contain significant fishery, wildlife, recreational, forestry, and cultural resources.

Description of Proposed Action Description of Proposed Action

In 1993 the BLM received a land exchange proposal from Clearwater Land Exchange (CLE), Inc. of Orofino, Idaho. Clearwater Land Exchange is a company that acts as an exchange facilitator specializing in government-private land exchanges in Idaho, Montana, Oregon and Washington. The NOALE can be characterized as a "pooled" transaction in which the parties are willing to change the position of their land holdings but the desired end result can not usually be accomplished using traditional on-on-one land exchanges. As facilitator, CLE assembles a pool of property from private landowners willing to sell or exchange lands to the BLM. CLE exchanges this assembled pool of property with the BLM on a value-for value basis and then transfers lands acquired from the BLM back to private owners, generally being adjoining landowners. The parties involved in this exchange proposal include BLM, Pioneer Resources, the JV Ranch, and dozens of other private landowners/ranches who own lands adjacent to scattered government lands considered for disposal.

The Final NOALE Environmental Impact Statement (EIS) was released for a 30 day public comment review in July of 1998.

This Biological Assessment analyzes effects of exchanging Phase 1 lands only. Future transactions will require separate NEPA documents and Section 7 ESA consultations if any effects to steelhead trout are anticipated. Phase 1 of this proposal would dispose approximately 51,700 acres of BLM-managed lands within six Hydrological Units located in central and northeastern Oregon (Upper John Day, Middle Fork John Day, North Fork John Day, Lower John Day, Umatilla, and

Beaver/South Fork Crooked). It is likely that some disposal tracts will be dropped from the exchange proposal as a result of public comments received, but this is not expected to change this BA's Determination of Effects. Approximately 51,800 acres of private lands could be acquired within two Hydrological Units (Upper John Day and North Fork John Day)

BLM disposal parcels range from 2 - 2,320 acres in size, and acquisition parcels range from 80 - 20,000 acres in size. BLM parcels are generally small and widely dispersed throughout the analysis area, while acquisition parcels are larger contiguous blocks of land.

Management of Lands to be Acquired

Land acquired by the BLM through exchange may be managed under existing plans, or new management direction may need development to adequately conserve wildlife and fish habitats. The BLM is mandated to apply multiple use management to public lands, and consider and allow all uses if consistent with the objectives of the governing land use plan (See NOALE EIS, p. 11). However, to protect resources and habitats the BLM is also mandated to follow other land use guidelines like PacFish, and ICBEMP (when completed). These plans provide overall guidance on how public lands will be managed. Additionally, any new projects (grazing allotments, timber harvesting, recreational developments, etc.) that are proposed on the newly acquired lands must first meet NEPA and ESA Section 7 requirements before implementation can occur.

Steelhead Trout Analysis

Disposal Lands

The BLM has determined, through individual tract analyses, that disposal/exchange of about 24,850 acres of the approximately 51,700 acres of proposed disposal lands included in Phase 1 may affect the Mid Columbia steelhead trout and its habitat. About 4,485 acres are commercial forestlands, and 20,365 acres are rangeland/grasslands, rocky scablands or cliffs. About 3.9 miles of suspected/known steelhead spawning and rearing habitat (SSH) lie within 15may affect disposal tracts. May Affect disposal parcels lie within five Hydrological Units:

- North Fork John Day #17070202
- Middle Fork John Day #17070203
- Upper John Day #17070201
- Lower John Day #17070204
- Umatilla #17070103

Acquisition Lands

Acquisition lands proposed in this land exchange include about 47,300 acres within the North Fork John Day Hydrologic Unit, and 4,700 acres within the Upper John Day Hydrologic Unit. About 40.9 miles of SSH, and 12.3 miles steelhead trout winter rearing habitat (SWH) can be acquired in the North Fork John Day River drainage between Wall Creek and Camas Creek (RM 22.6-56.8). Additionally, 2.4 miles SSH (S. Fork John Day drainage) and 0.2 miles steelhead summer rearing habitat (SRH) can be acquired in the Upper John Day subbasin. Acquisition of these lands and occupied habitat May Affect the MCU steelhead trout. For more detailed descriptions and conditions of the acquisition lands, refer to the NOALE FEIS, pages 53-65, and 115-120 (Phase 1 discussions).

Mitigation Measures and Monitoring

The long term effects of this proposal are anticipated to benefit steelhead trout and salmonid fisheries habitat in general, particularly in the North Fork John Day River Hydrologic Unit. Riparian and fish bearing streams under federal management receive a higher emphasis in protecting aquatic habitat than typically occurs on private forest and range lands. The most efficient manner in which BLM can manage lands in a manner to improve habitat conditions for steelhead trout, and subsequently facilitate recovery of the species, is to acquire sizable areas of occupied habitat and uplands from willing landowners. Because direct federal acquisition of private lands often is not agreeable with local governments, and funds usually are not available for this method either, exchange of lands is the most prudent option to acquire contiguous blocks of land with important resource values, including habitat for Threatened and Endangered Species.

Monitoring of riparian habitats on acquisition lands has already been initiated in 1996 with riparian photo points on the North Fork and tributaries. This method is simple and repeatable, and effective in monitoring changing habitat condition trends. Five year intervals are a standard protocol for repeating photo studies. Range/riparian condition studies will monitor grazing use on acquisition lands, and help determine if upland and riparian habitats are improving or not.

Description of Project Area

Because of the scattered positions and small size of BLM disposal tracts within the analysis area, it would not be meaningful to conduct watershed analyses for management of these lands. The BLM is a minority land manager in both basins, managing about 7 percent of the John Day Basin and about 1-2 percent of the Umatilla Basin.

Most stream segments on disposal tracts are short reaches (0.2 miles on average), varying in habitat conditions, and impractical to manage for . Because little management emphasis is directed to these scattered, small parcels, the likelihood that riparian conditions will improve appreciably on them is slight. By blocking land ownership and increasing contiguous stream miles into federal ownership, BLM can more easily implement management strategies that facilitate cold-water fish habitat improvement on an watershed scale.

General Habitat Conditions (All Hydrologic Units)

Salmonid habitat has decreased in both quantity and quality in the analysis area in recent history due to increased human activities and some natural events. Land uses such as timber harvesting, road construction, livestock grazing, dredge and placer mining (North and Middle Forks, and Upper Mainstem John Day watersheds), agriculture practices (irrigation water diversions, and encroachment on riparian zones), and stream channelization have impacted salmonid habitat in the John Day and Umatilla hydrologic units. Natural events such as insect infestations and epidemics, large catastrophic forest fires, and basin wide and localized flooding have further contributed to the degradation of riparian and instream habitats. It is difficult to estimate how land management practices may have exacerbated the severity and intensity of natural events impacting riparian habitat conditions.

Timber harvesting on public and private lands in the analysis area has impacted riparian habitats. Past harvesting of timber and disturbance of riparian vegetation along streams has reduced shading and contributed to instability of streambanks. Timber harvest along streams has limited the recruitment source of instream and off-channel structure of large wood. Instream large wood provides rearing habitat for juvenile salmonids and streambank stability, and creates habitat complexity.

Irrigation withdrawals in some stream segments limit production of salmonids in the basin. Fish habitat problems associated with surface water diversions (reduced available and suitable habitat, unsuitable water temperatures, and dewatering of stream channels) are compounded during drought years when stream flows fall below normal (John Day River Subbasin Report, 1990). Low streamflows mainly affect the rearing and instream movement of juvenile and resident adult salmonids. Adequate streamflows generally exist for adult passage to spawning grounds, and minimum streamflows are met on most years (John Day River Subbasin Report, 1990).

High streamflows in the winter and spring are a major sources of streambank erosion, which generally degrade or eliminate fish habitat (John Day River Subbasin Report, 1990). By summer, flows are low, and irrigation diversions may dewater streams on dry years. Summer flows that are minimized from irrigation diversions are subject to excessive heating, limiting water quality and habitat suitability for coldwater fishes (John Day River Subbasin Report, 1990).

John Day Basin

Historical descriptions of the John Day basin indicate that the John Day River was once a relatively stable river with good summer streamflows, water quality, and heavy riparian cover. Early writings of Peter Skene Ogden, a fur trader who traveled through the John Day Basin in 1825 and 1829, describes an abundance of beaver and diverse riparian vegetation. The North Fork streams were well wooded with aspen, poplar and willow; had good streamflows; and had good channel structure. The party was unable to ford horses through the John Day River in July near the present town of Prairie City (John Day River Subbasin Report, 1990).

Following the discovery of gold in the upper basin in the late 1800's, placer mining operations left many streams channelized with little or no shade, high sediment loads, and diverted flows. Dredge mining overturned larger stream channels, changing their natural courses, silted gravels, and destroyed stream cover.

The harvest of pine forests from the upper watershed then began to supply lumber to the growing communities. Early forest practices included removing timber from and building roads on steep slopes and streambanks. Heavy grazing pressure from sheep and cattle foraged perennial grass and shrub cover, converting large areas to weeds and forbs. As grass rangelands declined in the basin, and wildfire suppression increased, the expansion of juniper and sage distribution began.

More recently, livestock overgrazing, surface water irrigation diversions, stream channelization, timber harvesting, and road building activities caused further fish habitat degradation by damaging or suppressing riparian vegetation and destabilizing streambanks and watersheds (John Day River Subbasin Report, 1990). Riparian habitat degradation is still a problem in the John Day basin. According to the Oregon Water Resources Department (1986), land uses in the last 125 years may have had a significant impact on the basin's capacity to retain water and release it later in the season.

Riparian areas generally make up less than 1 percent of the public lands managed by the BLM. These areas contribute to biological diversity, streambank and channel stability, and water quality, yet are often the most heavily utilized. Recreation, livestock, agriculture/irrigation, roads, and wildlife all contribute to the total use of these fragile areas. (Two Rivers RMP, 1985). Ecological condition and trend data for riparian areas was collected in the John Day Basin BLM managed lands. Since that time, with the implementation of the Strategy for Salmon 1992, and PACFISH 1994, many riparian areas have management in place to protect and enhance their condition.

Upland vegetation is predominately big sagebrush/bunchgrass and bunchgrass, with some communities dominated by rabbitbrush and snakeweed. The rolling hills and plateaus above the drainages are usually dominated by big sagebrush on deeper soils, with low and/or stiff sagebrush on shallower soils. Bunchgrass dominated communities are also found on some of the plateaus and on most of the steep slopes of the river canyons. Public lands in the upper subbasins are dominated by ponderosa pine, Western juniper and big sagebrush vegetation zones

Approximately 60,000 acres of agriculture lands are irrigated in the John Day Basin, primarily to grow grass and alfalfa. The primary source of irrigation waters comes from diverting instream surface flows. Irrigated lands in the basin are concentrated primarily along the Upper John Day valley from Picture Gorge to the headwaters above Prairie City. Irrigated pastures in the North Fork drainage are primarily located downstream of Monument, Oregon. Irrigated acres in the Middle Fork drainage are scattered along the upper river valleys and meadows, and near Long Creek, Oregon. Within the analysis area are approximately 20,000 acres of irrigated pastures, mainly above John Day along the main stem and tributaries.

The basin's ability to naturally repair damaged habitats is slow in the John Day's semiarid environment, and some areas are adversely affected by activities that ceased long ago. Certain public and private lands in the basin have experienced significant improvements in riparian habitat quality in the last 20 years (Upper mainstem, lower mainstem, South Fork John Day).   Photopoint monitoring shows increasing densities of riparian vegetation species in these segments. Recent changes in grazing management on public lands along the North Fork John Day River are expected to facilitate riparian habitat improvement as well.   Recent dredge tailings reclamation work on Umatilla National Forest has started restoration processes on nine miles of the North Fork John Day River. This stream segment is habitat for bull trout, chinook salmon, and steelhead trout.

Conditions of the mainstem John Day River, its forks and tributaries, are in various stages of recovery and trends for all life stages of summer steelhead. Fish habitat condition, and trend surveys were conducted in 1980-81 on most perennial and fish bearing streams within the Prineville BLM District. Some surveys have been repeated in 1988-1990.

The North Fork John Day drainage contains the largest stronghold population segment and the majority of suitable habitat for bull trout in the John Day Basin (Unterwegner, 1997). Bull trout habitat in the North Fork has the most protection within designated wilderness (North Fork John Day Wilderness). The North Fork drainage has the best chemical, physical, and biological water quality in the basin and produces over 60 percent of the annual basin discharge (Oregon Water Res. Dept. 1986).

Umatilla Basin

Riparian conditions are generally good in the high elevation headwaters, and provide excellent fish habitat. Livestock grazing, road and railroad construction, and to a lesser extent forestry practices and other activities have degraded mid-elevation stream reaches. Fish production in many mid-elevation stream reaches is limited by high summer water temperatures, low or intermittent summer flows, lack of instream habitat diversity, and unstable stream channels. Low elevation riparian areas are generally in comparatively poor condition, primarily impacted from extensive and intensive agriculture practices (Umatilla River Subbasin Report, 1990). The Umatilla Basin produces large amounts of sediment, mostly from agriculture lands. Peak sedimentation occurs during freeze and thaw periods accompanied by rainstorms or rapid snowmelt.

Irrigation is the principal water use competing with fish production in the basin. A network

of tributary and mainstem Umatilla River irrigation diversions block an/or impede juvenile and adult salmonid migrants during periods of low streamflow. The lower 32 miles of the mainstem Umatilla River are frequently dewatered during the irrigation season, blocking emigrant juvenile fish and late arriving adults in the spring, and early arriving adults in the fall. Irrigation is the largest use of surface and groundwater in the basin. Many streams are over appropriated, and cumulative water rights and irrigation demands commonly exceed available streamflow (Umatilla River Subbasin Report, 1990).

Umatilla River headwaters generally are cool, clear, low in pollutants, and high in dissolved oxygen. High levels of suspended solids and fecal coliform are present in the lower 57 miles of the river. City of Pendleton effluent discharge periodically exceeds water quality standards. Feedlots, irrigation return flows, and other sources of nutrients and bacteria exceed water quality standards in summer months when pollutants are concentrated in low streamflows. Summer water temperatures in the lower reaches chronically exceed 70 F (Umatilla River Subbasin Report, 1990).

Fisheries Information and Watershed Baseline Conditions

Summer Steelhead

General Information

All steelhead in the Columbia River Basin upstream from The Dalles Dam are summer-run, inland steelhead (Schreck et al., 1986; Reisenbichler et al., 1992; Chapman et al., 1994). Steelhead in Fifteen Mile Creek, OR., are genetically allied with inland *O. mykiss*, but are winter-run. Winter steelhead are also found in the Klickitat and White Salmon Rivers, WA.

Life history information for steelhead of this ESU indicates that most middle Columbia River steelhead smolt at 2 years and spend one, two, or rarely, three years in the ocean (i.e., 1-salt, 2-salt, or three salt fish, respectively) prior to re-entering to fresh water, where they remain up to a year prior to spawning (Howel et al., 1985; Bonneville Power Association (BPA), 1992).

Summer steelhead occur throughout the John Day Basin where habitat conditions are suitable, and accessible. Some streams on public lands with documented spawning include tributaries of the Upper Mainstem John Day River (Dixie, Standard, Indian, Canyon, and Cottonwood Creeks), the South Fork John Day River (Deer and Murderers Creeks), the North Fork John Day River (Rudio Creek), and the Lower John Day River (Bridge, Bear, Gable, Ferry Canyon, Little Ferry Canyon, Pine Hollow, Long Hollow, and Jackknife Canyon.

In the early 1960's, fishery managers released about 500,000 hatchery winter steelhead fry and limited numbers of pre-smolts used for experimental purposes. Few likely survived due to the use of improper stocks and high hauling mortality. No production releases of hatchery steelhead smolts were ever made in the John Day Subbasin. Hatchery releases for any purposes ceased in 1966 in favor of wild stocks. Today, the John Day steelhead run is composed entirely of wild stock, with stray rates running 4 to 8 percent, a rate accepted by experts to be normal and necessary to maintain genetic diversity of the wild stock (ODFW, 1990).

John Day River summer steelhead are currently classified as a wild population on Oregon's Wild Fish Management Policy Provisional Wild Fish Population List [OAR 635-07-529(3)]. A population meets ODFW's definition of a wild population if it is an indigenous species, naturally reproducing within its native range, and descended from a population that is believed to have been present in the same geological area prior to the year 1800. Human caused genetic changes, either from interbreeding with hatchery origin fish or habitat modification, do not disqualify a population from the wild classification under this definition.

Life History and Population Characteristics

Adult steelhead on their spawning migration enter the Columbia River in mid-May, pass over Bonneville Dam July-August, and enter the John Day River (JDR) as early as September, and as late as March. Emigration into the John Day Basin is dependant upon water temperatures and flows, and usually peaks in October (Unterwegner, 1999, personal communication). Steelhead will likely hold in the Columbia or the lower Deschutes Rivers until water temperatures in the JDR are suitable.

Wild summer steelhead spawn in the basin from March to mid June. A majority of steelhead spawn in tributaries that enter the John Day River starting as low in the basin as Rock Creek, which is located near Condon, to those streams entering the upper main forks. About 20 percent may spawn in the upper main forks of the river, depending on spring runoff conditions. Typically the earliest spawning occurs in tributaries in the lower basin, probably because flows decrease earlier in these more arid drainages.

Steelhead eggs take about 30 days at 50 degrees F to hatch, and another two to three weeks to reach fry stage. Time required for incubation varies significantly with water temperature (ODFW, 1990). Fry emergence occurs in spring or early summer depending on time of spawning and water temperature during incubation.

Wild summer steelhead juveniles rear in the John Day basin for two to three years before migrating to the ocean as smolts. Rearing fish thrive in moderate gradient streams with high quality water, with summer water temperatures ranging from 50 to 65 degrees F. They also need streambank vegetation (grasses/sedges/, shrubs and trees) for food, cover, shade, nutrient cycling, good aquatic insect production, complex instream hiding cover, and instream large wood/structure. Ample pool habitat is essential in maximizing fish production.

Smolt migration out of the John Day Basin is staggered over several months (April to July), with peak timing in April and May (Unterwegner, 1999, personal communication). Smolt size varies by stream depending on food abundance and rearing water temperatures. Generally, healthy wild smolts average 7 inches in length. Some may be as large as 10 inches in some streams (Beech Creek, for example).

Downstream smolt movement is quite rapid, taking 45 days or less for smolts to reach the ocean from upstream rearing areas. Smolts migrate to the ocean with very determined swimming and feeding along the way. While in migration corridor habitat of the lower John Day River (Below Kimberly, RM 185, see Table 2), smolts generally stay within the river thalweg, using water depth and turbidity for cover (Unterwegner, 1999, personal communication). Smolts may stop and feed along backwaters and edges occasionally, or feed in the main current. Most smolts will reach the ocean by May, June, or July depending on the time of migration.

John Day summer steelhead typically return after one or two years in the Pacific ocean (termed 1-salt or 2-salt steelhead). About 80 percent of the John Day steelhead run are two-salt fish. Typical of other summer steelhead stocks, very few steelhead return to spawn a second time in the John Day River Basin.

Table 2. John Day River Segments and habitat utilization by steelhead trout*

River Segment	Steelhead Habitat Use
John Day River, Mouth (RM 0.0) to Kimberly (RM 185.0)	Migratory Corridor (No Rearing Habitat)
John Day River, RM 185.0 to RM 240.0 (Mount Vernon)	Juvenile Winter Rearing Habitat
John Day River, Mount Vernon (RM 240) to City of John Day (RM 248)	Juvenile Summer Rearing Habitat
John Day River, City of John Day (RM 248 to Headwaters)	Adult Spawning, Juvenile Rearing Habitat
South Fork John Day River, Mouth (RM 0.0) to Izee Falls (RM28.5)	Adult Spawning, Juvenile Rearing Habitat. No steelhead access above falls.
North Fork John Day River, Mouth (RM 0.0) to Camas Creek (RM 57.0)	Juvenile Winter Rearing Habitat. No Prineville BLM lands above RM 50.5
Middle Fork John Day River, Mouth (RM 0.0) to Highway 395 (RM 24.0)	Juvenile Winter Rearing Habitat
Middle Fork John Day River, Highway 395 (RM 24.0) to Headwaters	Adult Spawning, Juvenile Rearing Habitat

*Source: Unterwegner, Personal Communication

Chilcote (1998), assessed abundance, trend, and recruitment patterns for all five populations of John Day steelhead: Lower Mainstem (below Picture Gorge, RM 204), Upper Mainstem (above Picture Gorge), North Fork, Middle Fork, and South Fork. The general pattern in abundance for these populations shows a low point during the late 1970s followed by an increasing trend leading to peak counts during the late 1980s (Table 3). Recently, all populations have declined to lows similar to those observed in the late 1970s.

The Lower Mainstem, Upper Mainstem, and South Fork populations have remained depressed for several years (Figures 24, 25, and 28). During the last four years, these populations have been less than half of estimated equilibrium levels. While equally low or lower spawner densities were estimated in the 1970s, the levels observed in the 1990s cover a longer period of time (Chilcote, 1998).

Plots of spawner density indices for the Upper Mainstem (Figure 25), North Fork (Figure 26), and Middle Fork (Figure 27), populations all show a spike in abundance for the 1992 spawning year. A similar pattern was not observed in the Lower Mainstem and is indistinct in the South Fork (Chilcote, 1998).

According to Chilcote (1998), the spawner abundance analysis suggests the Lower Mainstem and South Fork John Day populations are the least healthy within the basin. The South Fork population in particular shows a decline in spawner densities large enough to warrant concern about its likely persistence.

Table 3. Index of steelhead spawners per stream survey mile for the five populations of John Day summer steelhead (1974-1997).

Year	Lower	Upper	North Fork	Middle	South

	Mainstem	**Mainstem**		**Fork**	**Fork**
1974	4.2	5.4	5.3	5.8	13.1
1975	12.2	8.1	7.4	8.5	18.8
1976	5.7	7.4	5.8	12.8	10.4
1977	0.7	9.2	3.8	10.3	12.7
1978	7.0	6.1	2.0	8.2	7.3
1979	0.3	0.9	1.9	1.6	3.8
1980	5.3	6.1	2.7	3.1	7.2
1981	5.8	3.8	3.2	6.2	5.7
1982	3.5	4.1	4.3	5.8	9.9
1983	3.9	8.2	5.1	4.1	12.0
1984	4.5	6.5	2.3	4.7	8.1
1985	7.0	10.9	9.3	7.7	15.4
1986	20.7	16.6	8.5	16.5	13.8
1987	21.9	16.3	9.6	9.7	18.4
1988	15.8	20.9	7.8	17.3	19.4
1989	6.5	5.8	1.5	5.8	3.5
1990	5.1	5.8	1.6	2.3	8.4
1991	3.8	3.5	1.8	3.8	4.2
1992	5.0	10.1	5.1	15.9	5.4
1993	1.8	2.3	2.0	3.5	3.2
1994	1.2	4.6	2.3	4.7	5.8
1995	1.8	1.4	1.6	1.6	2.8
1996	3.0	2.3	4.7	2.7	3.1
1997	3.0	2.2	2.6	3.0	1.9

Except for the South Fork John Day population, there are no obvious signs that steelhead populations in the basin are reproductively failing or at critically low population levels. The underlying recruitment relationship for the John Day populations suggest that their capacity to respond to environmental changes is still intact. Data suggest that much of the decline in recent years has been due to poor smolt to adult survival and not population failure within basins. Assuming this pattern is cyclic, the observed declines can be expected to reverse in the next three to five years (Chilcote, 1998).

The South Fork population appears to warrant an extirpation warning. There has been a large decline (-50%) in the six-year moving average abundance of wild steelhead in this population over the last 18 years (Chilcote, 1998). The reason for this exceptional decline in the South Fork population as compared to other John Day populations is unknown (Unterwegner, 1999 personal comm.). Riparian conditions in the South Fork watershed have improved significantly in the last 20 years, particularly on BLM managed lands.

Although the North Fork population appears to be returning to expected equilibrium abundance levels, all four remaining populations in this basin remain depressed. Recruitment modeling suggests the resiliency of John Day steelhead populations is relatively intact. However, the data do not support a clear conclusion that steelhead densities in this basin have bottomed-out and are returning to equilibrium levels (Chilcote, 1998).

Hatchery fish are not released into any of the five populations examined in the John Day Basin. In addition, this basin has the distinction of being one of the few large basins in Oregon with no history of a steelhead hatchery program. Although stray hatchery steelhead are caught in the lower mainstem, especially in the fishery below Cottonwood Bridge (RM 40), they have been rare in the upper basin. It is estimated that hatchery fish comprise less than 5 percent of the naturally spawning population (Chilcote, 1998).

Natural Production Constraints

Many tributaries utilized by wild summer steelhead for spawning and rearing experience low flows and high temperatures, both of which are related to stream bank degradation, poor riparian habitat conditions, and irrigation withdrawals. Stream bank degradation is a problem throughout the subbasin both in tributaries and portions of the mainstem.

Recreational harvest of wild summer steelhead in the JDR basin may have had a constraining effect on population size. Wild adult summer steelhead in the JDR basin have been protected from recreational harvest by regulation since September of 1995. Available data suggest that most wild juvenile migrants are 7 inches or less in length, and are protected from harvest by the 8 inch minimum length limit that has been in effect since 1997. Prior to 1997, the minimum length for harvest on trout was 6 inches. Bait fishing is allowed in all areas open to angling in the basin.

Based on studies from other river basins in the Pacific Northwest, there is speculation that recreational hooking and handling mortality of wild steelhead adults by hook and line anglers may contribute nearly 10 percent adult mortality of all caught and released fish (Unterwegner, 1999, personal comm.). This recreational angler induced mortality may be a significant management concern.

Natural events within the basin also constrain natural production.

Passage blocked naturally by Izee Falls on the South Fork John Day River (RM 28.5) prevents steelhead production in this segment of the South Fork and numerous tributaries to it. Several unscreened irrigation diversions in the Upper John Day subbasin contribute to losses of juvenile summer steelhead.

Prolonged drought conditions that started in the subbasin in 1984 or 1985 and continued more or less until 1994, exacerbated mainstem and tributary habitat deficiencies and may have contributed significantly to declining summer steelhead populations in the JDR basin.

A variety of man's activities outside and within the basin constrain natural production.

Passage conditions for both juvenile and adult anadromous fish at Columbia River mainstem dams contribute to declines in wild summer steelhead. The Dalles Dam, which all John Day River migrants must pass, has one of the lower rates of juvenile salmonid passage efficiency for mainstem Columbia dams due to a lack of turbine screening and effective juvenile bypass facilities. Bonneville Dam, particularly Powerhouse 2, does not have particularly effective juvenile turbine screening. Increased spill of water at both The Dalles and Bonneville dams to increase survival of Federal Endangered Species Act listed Snake River salmon should result in better survival of wild lower Deschutes River summer steelhead at these dams. Longer travel time for juveniles through dam created reservoirs in the Columbia, increased water temperature in the reservoir environment, and increased predation near mainstem dams all contribute to increased losses of juvenile and adult wild summer steelhead.

Harvest of wild summer steelhead by treaty tribal fisheries in the mainstem Columbia River is governed by the Columbia River Fish Management Plan (CRFMP 1987). This plan, agreed to by the four treaty tribes, the United States of America, and the states of Oregon, Washington, and Idaho, directs mainstem harvest decisions on wild summer steelhead using run sizes at Bonneville Dam. Treaty tribal impacts to wild summer steelhead are not to exceed 15% of the Group A (those crossing Bonneville Dam April 1 to August 25) wild escapement and 32% of the Group B (those crossing Bonneville Dam August 26 to October 31) wild escapement during fall treaty seasons. Harvest of wild summer steelhead by treaty tribal fisheries in the mainstem Columbia River has been and will continue to be a source of mortality to JDR basin origin wild summer steelhead.

Habitat problems affecting most inland steelhead trout populations include irrigation diversions and livestock grazing. These activities can modify river and stream channels; remove riparian vegetation; block migration routes seasonally; decrease summer flows; and increase summer water temperatures. Some populations have retreated to headwater areas as a result of these activities, causing extensive population fragmentation and declines in numbers (Kostow, 1995)

Natural events outside the subbasin also constrain natural production in the subbasin. According to Chilcote (1998), all seven Oregon populations in the Middle Columbia ESU (Lower John Day, Upper John Day, S. Fork John Day, N. Fork John Day, M. Fork John Day, Deschutes River, and the Umatilla River) appear to share a pattern of relatively high abundance during the mid-1980s, followed by a decline in the 1990s. This decline coincides with decreases in smolt-to-adult survival as estimated from hatchery fish released from Round Butte Hatchery. Because of this observation and the fact the decline in abundance is shared by all populations, the best explanation for the downward trend is common survival factors, most likely mainstem Columbia passage and ocean survival (Chilcote, 1998).

According to Taylor (1997), scientists have found that chinook salmon returns in the Northwest show long-term trends which closely follows the climate cycles. Anderson (1995), used the "Pacific Northwest Index" (PNI) to distinguish cool, wet periods from warm, dry ones from data which goes back to 1896. Anderson then compared PNI with Columbia River spring chinook salmon returns data which goes back to 1940. The correlation between spring chinook and PNI is very strong, as indicates that salmon returns increase during cool, wet periods and decline during warm, dry ones. The period 1976-1994 was considered a "Generally dry and warm" cycle. While there are undoubtedly human-induced effects on the fish (including dam construction and spawning/rearing habitat degradation), natural variability from climate cycles may be a very significant influence (Taylor, 1997)

There are indications that global ocean and atmosphere conditions are the cause of long-term climate variations which affect precipitation trends in the Northwest. There is also evidence that a switch in regimes occurred in late 1994, and that conditions which tend to yield wet, cool winters in the Northwest have returned (Taylor, 1997).

Ocean productivity is known to be cyclic and responsible for trends in anadromous species survival and abundance. Natural variation in ocean productivity and subsequent survival of summer steelhead in the ocean environment may be an important factor in JDR basin summer steelhead abundance. Protection and enhancement of subbasin habitat and summer steelhead populations remains, however, very important.

Low flow and high water temperatures in the Columbia River during drought years magnify mainstem dam passage problems for both adult and juvenile summer steelhead.

Baseline Conditions for May Affect Disposal Parcels in the Upper John Day Subbasin #17070201.

Introduction

The Upper John Day watershed encompasses 1.37 million acres from the headwaters of the John Day River upstream of Prairie City to the mouth of the North Fork John Day River at Kimberly, at River Mile 185. BLM manages about 145,635 acres within the subbasin. Major tributaries within the subbasin include Canyon, Beech, Rock, and Johnson Creeks and the South Fork John Day River. Streams on this list generally carry perennial flows, based on U.S.G.S. Quadrangle maps or direct observations. (See Table 4).

Table 4. Stream segments on May Affect BLM disposal parcels, what it flows into, and current steelhead status.

Stream Name	Public Miles	# Of Stream Segments	Tributary to	Steelhead Waters
John Day River	0.1	1	Columbia River	Winter Juvenile Rearing
Bear Creek	0.3	1	John Day River	Spawning and Rearing
W. Fk Little Indian Cr.	0.2	2	Indian Creek	No
Pine Creek	0.2	1	John Day River	Spawning and Rearing
Bear Gulch	0.3	1	Pine Creek	No
Grub Creek	0.3	1	John Day River	Spawning and Rearing
Hanscombe Cr. trib	0.2	1	Hanscombe Cr.	No
Beech Creek	0.3	2	John Day River	Spawning and Rearing
Capsuttle Creek	0.4	1	Riley Creek	No
McClellan Creek	0.1	1	John Day River	Spawning and Rearing
Warrens Creek	1.0	1	John Day River	No
West Dry Creek	0.4	1	Dry Creek	No
Marks Creek	0.4	1	John Day River	No
Franks Creek	0.7	1	John Day River	1.5 miles Spawning and Rearing, 3.6 miles No (barrier)
Belshaw Creek	0.1	1	John Day River	Spawning and Rearing
S. Fork John Day River	0.2	2	John Day River	No, above natural falls barrier
Sock Hollow	0.7	3	SFJDR	No
Abbott Creek	1.5	1	SFJDR	No
Flat Creek	1.2	2	SFJDR	No
Utley Creek	1.6	2	Flat Creek	No
Delles Creek	0.4	1	Corral Creek	No
Packwood Creek	0.2	1	Brisbois Creek	No
Tamarack Creek	0.2	1	Antelope Creek	No

Environmental Baseline

Description of Ratings of Baseline Indicators for Bear, W. Fork Little Indian, Pine, Bear Gulch, Grub, Hanscombe tributary, Beech, Capsuttle, and McClellan Creeks.

Water Temperature: From professional judgment, most of the creeks in this matrix list are suspected to meet the criteria of 57^{o}F for spawning, and 64^{o}F for summer rearing. **Properly Functioning**

Sediment/Turbidity: There is no sediment data on these streams. Turbidity generally is low. Professional judgement from direct observations would rate these streams as **Properly Functioning or At Risk**

Chemical Contamination/Nutrients: Nearly all reaches are above agriculture areas. No CWA 303d listed reaches. Professional judgement would rate these streams as **Properly Functioning**

Physical Barriers: No known physical barriers (man made). **Properly Functioning**

Substrate Embeddedness: There is little substrate embeddedness data available for these streams. Professional judgement would rate them as **At Risk.** This is due to direct observations and good streambank stability noted on most stream segments.

Large Wood: There is no quantified large wood data for these streams. Professional judgement would rate them as **Properly Functioning**. This is due to ample amounts of LWD observed in many of these stream segments. Although LWD pieces are not always 35 feet in length, they function well in these small streams.

Pool Frequency: Based on direct observations of these streams, pool frequency would be considered **Not Properly Functioning**.

Pool Quality: There is no sediment data on these streams. Deep pools are uncommon, but generally have good cover and cool water and probably have moderate volume reductions from fine sediments. Professional judgement from direct observations would rate these streams as **Properly Functioning or At Risk.**

Off-Channel Habitat: Due to the small size and moderate to steep gradient of these streams , little to no off channel habitat is expected to occur. **Not Applicable**

Refugia: Some of these streams segments are adjacent to National Forest lands. Streams generally are well buffered by intact riparian vegetation communities.

Professional judgement would rate the stream segments individually as too small to maintain viable sub-populations, but sufficient in size if grouped with additional stream segments on National Forests. **Properly Functioning or At Risk**

Wetted Width/Max Depth Ratio: There is no current width to depth ratio data available for these streams. Professional judgment from direct observations would rate them as **At Risk.**

Streambank Condition: Based on review of 1980 and 1989 riparian inventories and direct observations, most streams appear to be **At Risk.**

Floodplain Connectivity: Past mining, road building, grazing, and logging activities along these streams has reduced the linkage of wetland, floodplains, and riparian areas from main channels. Condition rated **At Risk**, from direct observation and professional judgment.

Changes in Peak Flow/Base Flow: Flow data is either not available or does not exist for most of these streams. Based on the highly mixed and fragmented land ownership pattern of BLM/private lands it is difficult to assess this watershed influenced habitat parameter. Professional judgement estimates condition as **At Risk**.

Drainage Network Increase: Increases of the drainage network are generally limited to road interaction with streams. Rills or gullies associated with roads and ATV trails are evident. Because of this, condition is rated **Not Properly Functioning**

Road Density and Location: Estimated average road densities for all BLM lands are between 2-3 mi/mi^2, with some valley bottom roads. **Functioning at Risk**

Disturbance History: Most BLM forested tracts have not had significant timber harvest, so past disturbance (% ECA) is less than 15%. **Properly Functioning**

Riparian Reserves: To be able to answer this question an assessment of the potential of the different riparian sites would have to be made. At this time no such assessment has occurred on the public lands on these streams. **Not Applicable**

Description of Ratings of Baseline Indicators for the Following Streams; John Day River, Warrens, West Dry, Marks, Franks, and Belshaw Creeks.

Water Temperature: None of the creeks listed for this matrix have been monitored for temperature. All likely exceed the criteria of 64°F for migration and rearing habitat. **Not Properly Functioning**

Sediment/Turbidity: There is no sediment data for these streams. Turbidity generally is low to moderate. Professional judgement from direct observations would rate these streams as **At Risk**

Chemical Contamination/Nutrients: Nearly all reaches are above agriculture areas. No CWA 303d listed reaches. Professional judgement would rate these streams as **Properly Functioning or At Risk**

Physical Barriers: There are no known man-made barriers for the streams listed in this matrix. **Properly Functioning**

Substrate Embeddedness: There is no substrate embeddedness data available for the creeks listed for this matrix. Professional judgement would put it in either the **At Risk or the Not Properly Functioning** category. This is due to direct observations of land management impacts on BLM and upstream private lands.

Large Wood: There is no quantified large wood data available for the creeks listed for this matrix. Professional judgement would put it in the **Not Properly Functioning** category. This is due to the lack of instream wood observed and that some streams are not in forested areas and naturally will not attain matrix standards..

Pool Frequency: Recent pool frequency data is not available for the creeks listed for this matrix. Professional judgement would put them in the **Not Properly Functioning** category. This is based on direct observations made.

Pool Quality: There is no sediment data available for the creeks listed for this matrix. Professional judgement would put it in either the **At Risk or the Not Properly Functioning** category, based on non comprehensive observations made.

Off-channel Habitat: Due to the small size and moderate to steep gradient of these streams , little to no off channel habitat is expected to occur. **Not Applicable**

Refugia: Based on professional judgement these stream segments are not of sufficient length, size, number and connectivity to maintain viable populations or sub-populations or serve as refugia. These segments generally are scattered among large portions of private lands, and not adjacent to other large stream segments on National Forest lands. **Not Properly Functioning**

Wetted Width/Max Depth Ratio: There is no current wetted width/max depth ratio data available for the creeks listed for this matrix. Professional judgement would put it in the **Not Properly Functioning** category. This is due to the lack of stability of these systems and also direct observations made.

Streambank Condition: There is no current streambank condition data available for the creeks listed for this matrix. From professional judgement and review of 1980 stream stability surveys, these streams are rated as **At Risk**.

Floodplain Connectivity: Little historic data exists showing the extent of wetlands and the frequency of overbank flows to compare to current conditions. Condition rated **At Risk,** based on direct observation and because of past management.

Changes in Peak Flow/Base Flow: There is little to no flow data available for the creeks listed for this matrix. Professional judgement would put it in the **At Risk** category. This is due to the reduction of perennial grasses and riparian vegetation in some areas that has probably limited the ability of these watersheds to dissipate energy and to store water. This could increase the peak flows on these systems, but would be difficult to measure.

Drainage Network Increase: Increases of the drainage network are generally limited to road interaction with streams. No data exists to show what changes may have occurred. Because some road fords occur through these streams, this condition is rated **At Risk.**

Road Density and Location: Estimated average road densities for all BLM lands are between 2-3 mi/mi^2, with roads along most stream segments. **Functioning at Risk**

Disturbance History: Most BLM forested tracts have not had significant timber harvest, so past disturbance (% ECA) is less than 15%. Generally harvesting has not been concentrated in unstable or riparian areas. **Properly Functioning**

Riparian Reserves: To be able to answer this question an assessment of the potential of the different riparian sites would have to be made. At this time no such assessment has occurred on the public lands on these streams. **Not Applicable**

Description of Ratings of Baseline Indicators for the South Fork John Day River and tributaries; Sock Hollow, Abbott, Flat, Utley, Delles, Packwood, and Tamarack Creeks. *Streams in this list are upstream of a natural barrier to steelhead trout (Izee Falls on the SF John Day River), and are occupied by redband trout and non-game species only.*

Water Temperature: Streams in this list are upstream of natural barrier to steelhead. Water temperatures have been monitored in the SF John Day River, and Flat Creek. **Not Properly Functioning**

Sediment/Turbidity: There is no sediment data available for the creeks listed for this matrix. Professional judgement would put it in either the **At Risk or Not Properly Functioning** category. This is due to the direct observations made.

Chemical Contamination/Nutrients: There is no chemical or nutrient data available for the creeks listed for this matrix. Professional judgement would put it in either the **At Risk** category.

Physical Barriers: Streams in this list are upstream of natural barrier to steelhead. **Not Applicable**

Substrate Embeddedness: There is no substrate embeddedness data available for the creeks listed for this matrix. Professional judgement would put it in either the **At Risk or Not Properly Functioning** category. This is due to direct observations and high turbidity levels in the South Fork.

Large Wood: There is no large wood data available for the creeks listed for this matrix. Professional judgement would put it in the **Not Properly Functioning** category. This is due to the lack of instream wood observed.

Pool Frequency: There is no current pool frequency data available for the creeks listed for this matrix. Professional judgement would put it in the **Not Properly Functioning** category. This is because it does not meet the pool frequency standards.

Pool Quality: There is no sediment data available for the creeks listed for this matrix. Professional judgement would rate this condition as **At Risk**. This is due to direct observation of volume reduction by fine sediments.

Off-channel Habitat: Based on direct observations of some backwater areas and professional judgement, this is rated **At Risk**.

Refugia: Streams in this list are upstream of natural barrier to steelhead. **Not Applicable**

Wetted Width/Max Depth Ratio: There is no current wetted width/max depth ratio data available for the creeks listed for this matrix. Professional judgement would put it in the **At Risk** category.

Streambank Condition: There is no current streambank condition data available for the creeks listed for this matrix. Professional judgement, direct observations, and review of riparian habitat inventories would categorize it as **At Risk**.

Floodplain Connectivity: Although little historic data exists showing the extent of wetlands and the frequency of overbank flows to compare to current conditions. Professional judgement would put it in to the **Properly Functioning to Functioning at Risk** category. This is due to the fair stability of these systems.

Changes in Peak Flow/Base Flow: Flow data has been collected on the South Fork John Day River. Past grazing activities have probably limited the ability of these watersheds to dissipate energy and store water. Upland conditions are generally improving now. Professional judgement estimates condition as **At Risk**.

Drainage Network Increase: Increases of the drainage network are generally limited to road interaction with streams. Based on roads commonly adjacent to streams and some road fords, this condition is rated **At Risk**.

Road Density and Location: Road densities are less than 3 mi/mi^2 with some valley bottom roads. **Functioning at Risk.**

Disturbance History: Most BLM forested tracts have not had significant timber harvest, so past disturbance (% ECA) is less than 15%. **Properly Functioning**

Riparian Reserves: To be able to answer this question an assessment of the potential of the different riparian sites would have to be made. At this time no such assessment has occurred on the public lands on these stream segments. **Not Applicable**

Baseline Conditions for the North Fork John Day Subbasin #17070202

Introduction

The North Fork John Day subbasin encompasses about 1.18 million acres. Prineville District BLM manages about 35,350 acres within the subbasin, from the mouth to the Umatilla/Grant County line (RM 51.4). Major tributaries within the subbasin include Granite, Desolation, Camas, Potamus, Big Wall, Cottonwood, and Rudio Creeks, and the Middle Fork John Day River. Streams on this list generally carry perennial flows, based on U.S.G.S. Quadrangle maps or direct observations. (See Table 5).

Table 5 . Stream segments on May Affect BLM disposal parcels, what it flows into, and current steelhead status.

Stream Name	Public Miles	# Of Stream Segments	Tributary to	Steelhead Waters
Cottonwood Creek	1.8	4	NFJDR	Spawning and Rearing
W. Fork Cochran Creek	0.6	1	Cochran Creek	No
Straight Creek	0.4	2	Gilmore Creek	Spawning and Rearing

Description of Ratings of Baseline Indicators for the following tributaries of the NFJDR; Cottonwood, W. F. Cochran, and Straight Creeks.

Water Temperature: BLM has no monitoring data for these streams. Professional judgement would estimate that these streams are within 57-60 degrees F during spawning, but that nearly all exceed 64^{o}F during summer rearing. **At Risk or Not Properly Functioning**

Sediment/Turbidity: There is no sediment data for these streams. From professional judgement and direct observations, this condition would be rated **At Risk**.

Chemical Contamination/Nutrients: No CWA 303d reaches for chemical contamination. Water quality data available for Rudio Creek. Minor amounts of agriculture lands above these stream reaches. **Properly Functioning**

Physical Barriers: There are no known manmade barriers to steelhead migration on these streams. **Properly Functioning**

Substrate Embeddedness: No embeddedness measurements have been made, professional judgement from direct observations would rate this condition **At Risk**.

Large Wood: There is no large wood data available for these streams. Professional judgement from direct observations and review of riparian habitat inventories would rate this condition as **At Risk or Not Properly Functioning.**

Pool Frequency: There is no current pool frequency data available for these streams. Professional judgement from review of 1980's stream surveys, would rate these streams as **Not Properly Functioning**. This is because pool frequency standards are not currently being met.

Pool Quality: Pool quality would be considered **Functioning at Risk** on these streams. This rating based review of 1980's stream surveys.

Off-Channel Habitat: No information is available to rate these streams. Based on review of 1980's stream surveys, condition is rated **At Risk**.

Refugia: Based on professional judgement these stream segments are not of sufficient length, size, number and connectivity to maintain viable populations or sub-populations or serve as refugia. These segments generally are scattered among large portions of private lands, and not connected to other contiguous stream segments on National Forest lands. **Not Properly Functioning**

Wetted Width/Max Depth Ratio: There is no current width to depth ratio data available for these streams. Professional judgement would rate them **Not Properly Functioning,** because these stream channel types are not expected to have width/depth ratios less than 12.

Streambank Condition: Based on review of 1980's stream surveys, most streams appear to be **At Risk.**

Floodplain Connectivity: Adjacent roads to these streams limits floodplain connectivity in areas. **At Risk**

Changes in Peak Flow/Base Flow: No long term flow data is available for these streams. Professional judgement would rate this as **At Risk.**

Drainage Network Increase: Increases of the drainage network are generally limited to road interaction with streams. Based on roads commonly adjacent to streams, and some stream fords, this condition is rated **At Risk**

Road Density and Location: Estimated average road densities are less than 3 mi/mi^2 with many valley bottom roads. **At Risk or Not Properly Functioning**

Disturbance History: Most BLM forested tracts have never been harvested, so past disturbance (% ECA) is less than 15%. **Properly Functioning**

Riparian Reserves: No assessment of riparian potential has occurred. Not Applicable.

Baseline Conditions for the Middle Fork John Day River Subbasin #17070203

Introduction

The Middle Fork John Day subbasin encompasses about 504,500 acres. Prineville District BLM manages about 3,975 acres within the subbasin, from the river mouth to the Malheur National Forest boundary (RM 43.1). Major tributaries within the subbasin include Clear, Granite Boulder, Camp, Big, and Long Creeks. Streams on this list generally carry perennial flows, based on U.S.G.S. Quadrangle maps or direct observations. (See Table 6).

Table 6. Stream segments on May Affect BLM parcels, what it flows into, and current steelhead status.

Stream Name	Public Miles	# Of Stream Segments	Tributary to	Steelhead Waters
MF John Day R. (below hiway 395)	0.6	2	NFJDR	Winter Rearing
MF John Day R. (Above hiway 395)	0.1	1	NFJDR	Spawning and Rearing
Long Creek	0.3	2	MFJDR	Spawning and Rearing
Jordan Creek	0.6	1	Long Creek	No
Cole Canyon	0.1	1	MFJDR	Spawning and Rearing
Troff Canyon	0.3	1	Cole Canyon	No
Threemile Creek	0.1	1	MFJDR	No

Description of Ratings of Baseline Indicators for the Middle Fork John Day River and tributaries including; Long, Jordan, Cole Canyon, Troff Canyon, and Threemile Creeks.

Water Temperature: Except for the MF John Day, none of these stream segments have been monitored for temperature on BLM lands. The MFJDR (1993-96), and Long Creek (1990-93), all exceeded 64 F standard, and listed under CWA 303d.. All other BLM stream segment likely exceed this summer rearing standard. Some may meet 57-60 F standard during spawning season, based on professional judgement. **Not Properly Functioning**

Sediment/Turbidity: There is no sediment data for these streams. From professional judgement and direct observations, this condition would be rated **At Risk**.

Chemical Contamination/Nutrients: The MFJDR (mouth to Crawford Creek) also is listed as a CWA 303d reach for flow modification. Professional judgement would rate this category as **At Risk** due to high water temperatures that would affect dissolved oxygen levels.

Physical Barriers: There are no known manmade barriers to steelhead migration on these streams. **Properly Functioning**

Substrate Embeddedness: No embeddedness measurements have been made, professional judgement from direct observations would rate this condition **At Risk**.

Large Wood: There is no large wood data available for these streams. Professional judgement from direct observations and review of riparian habitat inventories would rate this condition as **At Risk or Not Properly Functioning.**

Pool Frequency: There is no current pool frequency data available for these streams. Professional judgement from review of riparian habitat inventories would rate these streams as **Not Properly Functioning**. This is because pool frequency standards are not currently being met.

Pool Quality: Pool quality would be considered **Functioning at Risk** on these streams. This rating based on review of riparian habitat inventories.

Off-Channel Habitat: No information is available to rate these streams. Based on review of riparian habitat inventories, condition is rated **Not Properly Functioning**.

Refugia: Based on professional judgement these stream segments are not of sufficient length, size, number and connectivity to maintain viable populations or sub-populations or serve as refugia. These segments are scattered among large portions of private lands, with little connectivity to other contiguous stream segments on National Forest lands. **Not Properly Functioning**

Wetted Width/Max Depth Ratio: There is no current width to depth ratio data available for these streams. Professional judgement would rate them **Not Properly Functioning,** because these stream channel types are not expected to have width/depth ratios less than 12.

Streambank Condition: Based on review of riparian habitat inventories, most streams appear to be **At Risk.**

Floodplain Connectivity: From professional judgement and review of riparian habitat inventories, this is rated **At Risk.** Historic data showing the extent of wetlands and the frequency of overbank flows to compare to current conditions is unknown.

Changes in Peak Flow/Base Flow: From review of riparian inventories, there is no evidence of peak flow/base flow changes on BLM stream segments. **Properly Functioning**

Drainage Network Increase: Increases of the drainage network are generally limited to road interaction with streams. Based on roads commonly adjacent to streams, this condition is rated **At Risk**

Road Density and Location: Estimated average road densities are 1-2.4 mi/mi^2 with many valley bottom roads. **At Risk or Not Properly Functioning**

Disturbance History: Most BLM forested tracts have never been harvested, so past disturbance (% ECA) is less than 15%. **Properly Functioning**

Riparian Reserves: To be able to answer this question an assessment of the potential of the different riparian sites would have to be made. At this time no such assessment has occurred on the public lands on these streams. **Not Applicable**

Baseline Conditions for the Lower John Day River Subbasin #17070204

Introduction

The Lower John Day subbasin encompasses about 2,011,000 acres. Prineville District BLM manages about 242,600 acres within the subbasin, from the river mouth to the confluence with the North Fork at Kimberly (RM 185). Major tributaries within the subbasin include Parrish, Kahler, Bridge, Pine, Butte, Thirty Mile, and Rock Creeks. Table 7 lists perennial, intermittent, and ephemeral drainages in this basin that on public lands.

Table 7. - Stream segments on May Affect BLM parcels, what it flows into, and current steelhead status.

Stream Name	Public Miles	# Of Stream Segments	Tributary to	Steelhead Waters
Kahler Creek	0.05	1	LJDR	Spawning and Rearing
Little Searcy Creek	0.3	1	Thirtymile Creek	No

Description of Ratings of Baseline Indicators for perennial streams in the Lower John Day River below Kimberly. These include: Kahler Creek (0.05 miles spawning/rearing), Little Searcy Creek (0.3 miles, no steelhead use).

Water Temperature: Water temperature typically exceeds state DEQ water quality threshold of 64°. These streams provide a wide variety of habitat from migratory to spawning/rearing. **Not Properly Functioning**

Sediment/Turbidity: Sediment seems to be transported through these systems during high flows. Sediment buildup appears to be occurring in many stream segments associated with hydrophytic plant populations, especially willow species. Dominant substrate is gravel/cobble/ sand. Early spring runoff produces moderate to high turbidity in these streams. **Not Properly Functioning**

Chemical Contamination/Nutrients: The are no known chemical contaminants in these areas. **Properly Functioning**

Physical Barriers: No known barriers. **Properly Functioning**

Substrate: Substrate is dominated be gravel/cobble with fines. Embeddedness is moderately high with fine sediment evident within the stream channel. **At Risk**

Large Wood: Large wood in these perennial streams historically played a larger role in pool formation, stream shade, and streambank stability than currently. Historic land use practices have adversely affected new recruitments, flood events have physically removed mature trees (cottonwoods, alders, willows, birch, and other species), or segregated overstory trees from water tables as stream reaches experienced downcutting. Based on review of 1980's riparian inventories, condition is **Not Properly Functioning**

Pool Frequency: Pools frequencies standards are not met in these streams. Many of these stream reaches are improving in condition. As riparian conditions improve, pool frequencies are expected to increase. **Not Properly Functioning**

Pool Quality: Little information on pool condition and quality is available. Based on review of 1980's riparian inventories, condition is rated **At Risk**

Off-Channel Habitat: Off channel habitats are being developed as these streams develop and rebuild floodlains. Beaver presence has also led to an increase in these habitats. **At Risk**

Refugia: Refugia are present in these areas with increasing frequency. As stream conditions continue to improve these areas will become more connected and functional. **At Risk**

Width/Depth Ratio: Increase in healthy riparian vegetation has led to a narrowing of the stream channels in most areas and therefore a decrease in the width to depth ratio. **At Risk**

Streambank Condition: Streambanks in many areas show evidence of downcutting. Conditions are **Not Properly Functioning**

Floodplain Connectivity: Many of these streams have historically had significant down cutting of stream channels. Changes in grazing management have led to increased riparian vegetation, bank stability, and floodplain area. High flows have then led to a widening of stream bottom which has served to reestablish new floodplains in many areas. **At Risk**

Changes in Peak/Base Flows: Improvements in riparian vegetation and bank structure in recent years may be increasing base flows in some streams. This is still speculative, however. **At Risk**

Increases in Drainage Network: Roads have not increased the drainage network within the watershed. There has probably been some increase in sediment due to road placement, but the drainage network itself probably has not increased. **Properly Functioning**

Road Density and Location: Road densities are low, with some valley bottom roads. **At Risk**

Disturbance History: BLM timber harvest of forested parcels within the lower John Day Basin is minimal. **Properly Functioning/Not Applicable**

Riparian Reserves: To characterize this habitat indicator, an assessment of the potential riparian sites on public lands would have to be done. No such assessment has been made. **Not Applicable**

Baseline Conditions for the Umatilla River Subbasin #17070103

Introduction

The Umatilla River originates on the west slope of the Blue Mountains east of Pendleton in northeast Oregon. The river flows northwesterly across the Umatilla Plateau for about 115 miles to it's confluence with the Columbia River at RM 289. Virtually all of the 1.46 million acre drainage is within Umatilla County. Vale District BLM manages about scattered, small parcels within the subbasin, from the river mouth to scattered parcels in headwater areas. Major tributaries within the subbasin include the North Fork, Meacham, McKay, Birch, and Butter Creeks. Streams on this list generally carry perennial flows, based on U.S.G.S. Quadrangle maps or direct observations. (See Table 8).

Table 8. Stream segments on May Affect BLM parcels, what it flows into, and current steelhead status.

Stream Name	Public Miles	# Of Stream Segments	Tributary to	Steelhead Waters
Sawmill Canyon Creek	0.02	1	Butter Creek	No
E.F. Butter Creek	0.05	1	Butter Creek	Spawning and Rearing
Sperry Creek	0.3	1	Houselog Creek	No

Description of Ratings of Baseline Indicators for Umatilla River tributaries including; Sawmill Canyon, E.F. Butter, and Sperry Creeks.

Water Temperature: None of these stream segments have been monitored for temperature on BLM lands. These streams are located high in their drainages. Some may meet 57-60 F standard during spawning season, based on professional judgement. **At Risk**

Sediment/Turbidity: There is no sediment data for these streams. From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Chemical Contamination/Nutrients: From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Physical Barriers: There are no known manmade barriers to steelhead migration on these streams. **Properly Functioning**

Substrate Embeddedness: From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Large Wood: There is no large wood data available for these streams. From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Pool Frequency: There is no current pool frequency data available for these streams. From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Pool Quality: From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Off-Channel Habitat: Due to the small size and moderate to steep gradient of these streams , little to no off channel habitat is expected to occur. **Not Applicable**

Refugia: Based on professional judgement these stream segments are not of sufficient length, size, number and connectivity to maintain viable populations or sub-populations or serve as refugia. These segments are scattered among large portions of private lands, with little connectivity to other contiguous stream segments on National Forest lands. **Not Applicable**

Wetted Width/Max Depth Ratio: There is no current width to depth ratio data available for these streams. From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Streambank Condition: From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Floodplain Connectivity: From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Changes in Peak Flow/Base Flow: From professional judgement based on drainage location of these streams, this parameter would be rated as **At Risk**.

Drainage Network Increase: Increases of the drainage network are generally limited to road interaction with streams. Based on roads commonly adjacent to streams, this condition is rated **At Risk**

Road Density and Location: Estimated average road densities are 2-3 mi/mi2 with some valley bottom roads. **At Risk**

Disturbance History: Most BLM forested tracts have never been harvested, so past disturbance (% ECA) is less than 15%. **Properly Functioning**

Riparian Reserves: No assessment of riparian potential has occurred. **Not Applicable.**

Analyses of May Affect Parcels by Hydrologic Unit

Level 1 biologists from BLM and NMFS discussed and agreed upon the following rationale for determining the individual parcel effects of exchanging lands on steelhead trout and their habitats. A broader determination of effects on the 4^{th} Field HUC level, compares the loss of habitat on disposal parcels weighed against the gain of habitat on acquisition lands. Consequently, some individual forested disposal parcels may be Likely to Adversely Affect the species, based on reasonable and foreseeable management actions, after transfer to private entities. However, the overall determination for NOALE will be based upon the larger perspective of net federal gain of steelhead trout habitat, particularly spawning/rearing habitat.

Rangeland parcels that have no stream channels (perennial or intermittent) on public lands were considered to have No Effect (NE) to steelhead or its habitat. Management on rangeland parcels is not expected to change significantly after transfer to private ownership. These tracts also have no riverine connectivity to downstream occupied steelhead habitats.

Rangeland parcels that have intermittent (non fish-bearing) streams and connectivity to steelhead spawning or rearing habitat were considered Not Likely to Adversely Affect (NLAA) steelhead trout or its habitat. Rangeland parcels with segments of occupied steelhead streams (spawning/incubation/summer rearing) were considered Not Likely to Adversely Affect the species.

Individual forested parcels containing commercial timber lands and occupied steelhead stream segments (spawning/incubation/summer rearing) were considered Likely to Adversely Affect (LAA) the species. This is based upon the potential loss of riparian canopy cover after timber harvest, and potential water quality effects from road building activities. For analysis purposes, it is assumed that timbered parcels will be harvested to the extent allowed under the State Forestry Practices Act within 10 years after transfer to private management.

Individual forested parcels containing commercial timber lands and intermittent stream (non fish-bearing) segments were considered either NLAA or LAA. Determination was dependant on factors such as existing roads to access timber resources, slope steepness, and stream channel distance to downstream occupied steelhead habitats. If a tract has existing roads, has moderate slopes (less than 35%), and is miles from occupied habitat, a NLAA determination was made. Adverse impacts to water temperatures and sediment levels would not be expected to occur in occupied habitats downstream from harvesting timber on tracts with these characteristics. Tracts that have steeper slopes (over 35%), do not have adequate road access, and are relatively close to occupied steelhead habitat are considered LAA.

Individual forested parcels that contain commercial timber lands, but have no stream channel segments within the tract are considered to have No Effect to steelhead because of their lack of channel connectivity to downstream habitats.

All NOALE disposal tracts in the Upper S. F. John Day River drainage are above Izee Falls, which is a barrier to anadromous fish. All rangeland tracts were considered to have No Effect to steelhead, except those tracts with perennial stream channels, which are considered Not Likely to Adversely Affect steelhead. These tracts are 7-35 riverine miles upstream of occupied habitat in the S.F. John Day River. Timbered tracts in this area containing perennial or intermittent stream channels were considered Not Likely To Adversely Affect steelhead habitat, 15-35 riverine miles downstream.

Table 9a: May Affect Disposal Lands in the North Fork John Day HUC (Currently BLM)

BLM Disposal Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
G5, G53, G83B, G94A,B, G97, G718	800/257	0.0	0.0	1.4	NLAA	Upland forested tracts. Tracts are 0.4 to 4.0 miles from steelhead winter rearing habitat. No potential habitat.
G711-713, G715	240/195	0.0	0.0	0.7	NLAA	Upland forested tracts. Moderately steep slopes (25%-30%), and some roads exist already. G711-713 are 2.2 to 3.0 riverine mi. to SSH in Gilmore Creek. G715 3.0 mi. to SSH in Camp Creek.
G714	120/85	0.0	0.0	1.0	LAA	Steep slopes on forested parcel, which has confluence of three intermittent drainages. Some road construction likely to harvest tract. About 2.0 mi. to SSH in Cottonwood Cr.
UM6, UM52, UM55, UM61, UM80	520/287	0.0	0.0	1.1	NLAA	Upland forested tracts with intermittent stream channels. No perennial waters or occupied steelhead habitat. Tracts are 2.1 to 4.2 riverine miles to suspected/known steelhead spawning and/or rearing habitat.
G64ABC, G68C, G709	1,120/0	1.8 SSH	1.8	1.6	NLAA	Rangeland tracts. Management of these lands not expected to change significantly following transfer into private ownership. Perennial streams include Cottonwood Creek (1.8 mi. SSH on parcels G64ABC, G68C, and G709).
G19, G55A, G65A,B,C, G78, G79, G80, G85A,B, G86, G90, G93,	2,720/0	0.0	0.0	6.3	NLAA	Rangeland tracts with some intermittent stream channels. No perennial waters or occupied steelhead habitat. Tracts are 0.2 to 3.0 channel miles to suspected/known steelhead spawning and/or rearing habitat.
Totals	**5,520/824**	**1.8 SSH**	**1.8**	**12.1**		

Note 1: **LAA** = Likely to Adversely Affect; **NLAA** = Not Likely to Adversely Affect
* Fish bearing and non fish bearing streams
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat

Table 9b: **Acquisition Lands in North Fork John Day HUC (Currently Private)**

Acquisition Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
Acq. Area #1: N. Fork John Day River and uplands from Camas to Graves Creeks.	25,940/ 7,620	19.8 SSH + 12.0 SWH	42.8	33.6	NLAA	19.8 miles of SSH in Stony, Potamus, Little Potamus, Graves, Mallory, Deerhorn, and Jericho Creeks. 12.0 miles of SWH on the North Fork John Day River. Forest lands along river corridor, tributaries, and forested/rangeland uplands. See Map.
Acq. Area #2: JV Ranch and tracts in upper Little Wall Creek drainage.	20,360/ 1,160	18.6 SSH	18.6	36.2	NLAA	18.6 miles of SSH in tributaries (Wall, Little Wall, Cabin, and Ditch Creek drainages) that drain into North Fork John Day River. Mostly rangeland habitat/uplands. See Map.
Acq. Area #3: Lower Wall Creek	840/50	2.5 SSH	2.5	1.3	NLAA	2.5 miles of SSH on Wall Creek. Drains into the N. Fork John Day River.
Acq. Area #4: North Fork John Day River. Deer Creek Ranch.	160/35	0.3 SWH	0.3	0.7	NLAA	0.3 miles of SWH on the N. Fork John Day River. Private inholding within large block of BLM-managed lands.
Totals	**47,400/ 8,865**	**53.2 (40.9 SSH + 12.3 SWH)**	**64.2**	**71.8**		

Note 1: **LAA** = Likely to Adversely Affect; **NLAA** = Not Likely to Adversely Affect
* Fish bearing and non fish bearing
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat

Table 9c: North Fork John Day Hydrologic Unit Summary

Land Exchange Tracts	Total Acres/ Timber Acres	Occupied Steelhead Trout Habitat (Miles)	Perennial Streams* (Miles)	Non-Perennial Streams** (Miles)	LAA, NLAA, Note 1	Rationale
Net Change in Hydrological Unit	N/A	+51.4 (39.1 SSH + 12.3 SWH)	+62.4	+59.7	NLAA	Net gain of 39.1 miles of SSH in 14 tributaries, and net gain of 12.3 miles of SWH in the North Fork John Day River.

Hydrologic Unit: Middle Fork John Day #17070203

Table 10a: May Affect Disposal Lands in the Middle Fork John Day HUC (Currently BLM)

BLM Disposal Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
G2, G4, G25-26, G46, G104A	626/227	0.0	0.0	0.4	NLAA	Upland forested tracts with intermittent stream channels. No perennial waters or occupied steelhead habitat. Tracts are 0.4 to 2.0 riverine miles to suspected/known steelhead spawning and/or rearing habitat.
G24, G28, G34, G708	1,120/102	0.2 SSH 0.4 SWH 0.1 SRH	0.7	1.5	LAA	Partially forested tracts on the Middle Fork John Day River, Long Creek and Cole Canyon Creek. G24 (0.1 mi on Cole Canyon), G28 (0.1mi on Long Cr.) and G708 (0.1 mi on MFJDR) are considered potential SSH by ODFW. However the MFJDR stream segment (G708) does not contain suitable spawning substrate, therefore it is considered steelhead summer rearing habitat (SRH). Parcel G34 contains 0.4 mi SWH on the MFJDR..
G29, G37, G38A, G703	242/0	0.3 SWH	0.3	0.9	NLAA	Rangeland tracts. G703 has 0.3 miles of SWH on lower Long Creek and the MFJDR. Remaining tracts are 0.3 to 1.5 riverine miles to SSH.
Totals	**1,988/329**	**1.0 (0.2 SSH + 0.7 SWH + 0.1 SRH)**	**1.0**	**2.8**		

Note 1: **LAA** = Likely to Adversely Affect; **NLAA** = Not Likely to Adversely Affect
* Fish bearing and non fish bearing streams
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat
SRH= Steelhead Summer Rearing Habitat

Table 10b: Acquisition Lands in Middle Fork John Day HUC (Currently Private)

BLM Acquisition Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
No Acquisition lands in this Hydrologic Unit						
Totals	**0.0**	**0.0**	**0.0**	**0.0**		

Table 10c: Hydrologic Unit Summary of the Middle Fork John Day HUC

Land Exchange Tracts	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
Net Change in Hydrological Unit	N/A	-0.2 SSH -0.1 SRH -0.7 SWH	-1.0	-2.8	NLAA	Although a net loss of 1.0 miles of steelhead habitat within the subbasin, only 0.2 miles (on 2 tracts) reasonably may contain support spawning habitat (unconfirmed).

Fish bearing and non fish bearing streams
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat
SRH= Steelhead Summer Rearing Habitat

Hydrologic Unit: Upper John Day #17070201

Table 11a: May Affect Disposal Lands in the Upper John Day HUC (Currently BLM)

BLM Disposal Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
G43-45, G150A, G151A, G158-59, G161B, G186, G197, G205,G219,	2,320/945	1.0 of SSH (6 parcels)	1.8	2.1	LAA.	Forested parcels. Within 6 parcels (G143, 150A, 151A, 161B, 197, and 219), is 1.0 mile of SSH. Timber harvest on these parcels under private management (State Forestry regulated) may adversely affect adjacent occupied habitat. Required stream buffers are narrower on State regulated forestlands than on federal lands. Stream shade may be reduced along these segments, and potentially water temperatures could increase from current conditions. Potential road building to harvest these parcels and others without occupied streams may increase localized instream sedimentation.
G142, G156-157, G160, G161A G163, G191-192, G204, G209A,B, G210B, G213, G218, G216, G426	2,818/1,565	0.2 of SSH	0.2	6.7	NLAA	Mostly upland, forested parcels, with gentle to moderately steep slopes. None contain perennial streams or occupied habitat except G218 (0.2 mi. SSH in Pine Creek), which has only 7 acres of commercial timber well away from the floodplain of Pine Creek. All other tracts are 0.1 to 3.0 riverine miles from SSH, via intermittent stream channels. G209A,B and 210B contain 697 timber acres, are upland with gentle to moderate slopes, and road systems suitable for timber management already exist. G160 (134 timber acres) is 0.5 mi. to SSH in Bear Creek, but has existing roads suitable for harvest activities.
G133B, G151B, G155, G165, G166, G167, G168A, G169B, G171, G181, G193, G284A, G298,	2,552/0	0.6 of SSH	1.0	6.4	NLAA	Rangeland tracts. Management of these lands not expected to change significantly following transfer into private ownership. Perennial streams include Grub (0.3 mi. SSH, parcel G167) and Franks (0.7 mi.) Creeks. In G133B is 0.3 mi. of SSH in Franks Creek, below a waterfall barrier that appears to be an man-made channel re-route. All other tracts are 0.1 to 1.0 riverine miles to SSH.
G133A, G134, G135, G136A, G136B,G175, G180, G184	2,960/0	0.1of SWH	1.2	7.6	NLAA	Rangeland tracts. Management of these lands not expected to change significantly following transfer into private ownership. Perennial streams include the John Day River (0.1 mi. SWH on parcel G136B) and Warrens Creek (1.1 mi. of unoccupied habitat in parcel G180). All other tracts are 0.1 to 3.5 riverine miles from SWH, except G184, which is 1.8 riverine miles to SRH in the JDR.
G281, G284A	330/0	0.0	0.2	0.7	NLAA	Rangeland tracts near the towns of John Day and Canyon City. Potential for municipal development. G281 (20 acres) is within 0.1 of SSH in Canyon Creek, but contains no stream channels.. G284A (310 acres) has 0.2 perennial stream miles., and is mostly steep hillside. Within 0.1 miles of SSH in Canyon Creek.
Totals	**10,980/2,510**	**(1.9) 1.8 SSH + 0.1 SWH**	**4.4**	**23.5**		

LAA = Likely to Adversely Affect; **NLAA** = Not Likely to Adversely Affect
* Fish bearing and non fish bearing streams
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat SRH= Steelhead Summer Rearing Habitat

Hydrologic Unit: Upper John Day #17070201 (Above Izee Falls on SF John Day River)

Table 11b: May Affect Disposal Lands in the Upper John Day HUC (Currently BLM) Above Izee Falls

BLM Disposal Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
G240C, G246, G246B,G247, G247B, G261, G266, G430,	3,460/0	0.0	3.4 (8 parcels)	1.9	NLAA.	Rangeland tracts. Management of these lands not expected to change significantly following transfer into private ownership. Perennial stream segments include 0.2 mi. RH in the SF John Day River (G430), 0.2 mi. RH in Packwood Creek (G240C), 1.6 mi. of Abbot Creek (G246B, 247A), 0.2 mi. of Pole Canyon (G247), 0.8 mi. RH in Utley Creek (G261), and 0.2 mi.of Delles Creek (G266). All tracts 8-20 riverine miles from SSH in SF John Day River.
G238, G24A, G251, G260, G265B, G276	2,040/341	0.0	1.8	4.0	NLAA	Forested/partially forested tracts that are 13-25 riverine miles to SSH in the SF John Day River. Timber harvest on these parcels under private management (State Forestry regulated) may adversely affect fish habitat for a limited distance downstream. Required stream buffers are narrower on State regulated forestlands than on federal lands. Stream shade may be reduced along these segments, and potentially water temperatures could increase from current conditions. Potential road building to harvest these parcels may increase localized instream sedimentation. It is not likely however that these disturbances will adversely affect occupied steelhead trout habitat 13-25 miles downstream in the SF John Day River. Perennial stream segments include 0.3 and 0.9 mi. RH in Flat Creek (G251 and G260), 0.3 mi. Delles Creek (G265B), and 0.3 mi.of RH in Tamarack Creek (G276).
Totals	**5,500/341**	**0.0**	**5.2**	**5.9**		

Note 1: **LAA** = Likely to Adversely Affect; **NLAA** = Not Likely to Adversely Affect
* Fish bearing and non fish bearing streams
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat
SRH= Steelhead Summer Rearing Habitat

Table 11c: Acquisition Lands in the Upper John Day HUC (Currently Private)

BLM Acquisition Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
Acq. Area #5: S F John Day River Drainage	4,500/2,900	2.4 SSH	7.9	10.2	NLAA	Can acquire 2.4 mi. SSH (in 2 segments) on the SF John Day River. Also 5.5 miles RH in the SFJDR and Indian Creek above Izee Falls.
Acq. Area #5: Dixie Creek drainage	200/200	0.2 SRH	1.0	0.0	NLAA	0.2 miles on Comer Creek, which could support rearing habitat, but not suitable as spawning habitat..
Totals	**4,700/3,100**	**2.6 (2.4 SSH + 0.2 SRH)**	**8.9**	**10.2**		

Table 11d: Hydrologic Unit Summary of the Upper John Day HUC

Land Exchange Tracts	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
Net Change in Hydrologica l Unit	N/A	+0.6 SSH +0.2 SRH -0.1 SWH	-0.7	-19.2	NLAA	Small net gain of steelhead trout suspected/known spawning and rearing habitat within the 4th field HUC.

Hydrologic Unit: Lower John Day River #17070204

Table 12a: May Affect Disposal Lands in the Lower John Day HUC (Currently BLM)

BLM Disposal Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
W4	40/40	0.0	0.3	0.0	LAA	0.3 mi. Little Searcy Cr., and 1.8 miles to SSH in Thirtymile Cr. Timber harvest on this parcels under private management (State Forestry regulated) may adversely affect adjacent downstream occupied habitat. Required stream buffers are narrower on State regulated forestlands than on federal lands. Stream shade may be reduced along this segment, and potentially water temperatures could increase from current conditions. Potential road building to harvest this parcel may increase localized instream sedimentation.
W14, 15, 33, 34, and M2	343/242	0.0	0.0	1.4	NLAA	Upland forested tracts with moderate to steep slopes. Tracts are 0.3 to 4.0 riverine miles to SSH. Most timber in W33 (160 acres) burned in a 1997 fire.
W37	200/0	0.05 SSH	0.05	0.9	NLAA	Rangeland tract with a small stream segment (0.05 mi) of SSH in Kahler Creek.
Totals	**583/282**	**0.05 SSH**	**0.35**	**2.3**		

Note 1: **LAA** = Likely to Adversely Affect; **NLAA** = Not Likely to Adversely Affect
* Fish bearing and non fish bearing streams
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat
SRH= Steelhead Summer Rearing Habitat

Table 12b: Acquisition Lands in the Lower John Day HUC (Currently Private)

BLM Acquisition Parcel #	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
No Acquisition lands in this Hydrologic Unit						
Totals	**0.0**	**0.0**	**0.0**	**0.0**		

Table 12c: Hydrologic Unit Summary of the Lower John Day HUC

Land	**Total Acres/**	**Occupied**	**Perennial**	**Non-**	**LAA,**	**Rationale**

Exchange Tracts	Timber Acres	Steelhead Trout Habitat (Miles)	Streams* (Miles)	Perennial Streams** (Miles)	NLAA, Note 1	
Net Change in Hydrological Unit	N/A	-0.05 SSH	-0.35	-2.3	NLAA	Small net loss of steelhead trout suspected/known spawning and rearing habitat within the 4th field HUC.

Hydrologic Unit: Umatilla River #17070103

Table 13a: May Affect Disposal Lands in the Umatilla River HUC (Currently BLM)

BLM Disposal Parcel #	Total Acres/ Timber Acres	Occupied Steelhead Trout Habitat (Miles)	Perennial Streams* (Miles)	Non-Perennial Streams** (Miles)	LAA, NLAA, Note 1	Rationale
UM10	40/25	0.05 SSH	0.05	0.0	LAA	Upland forested tract with moderately steep slopes. Contains 0.05 miles SSH in E. Fork Butter Creek.
M8, M12	160/99	0.0	0.32	0.02	NLAA	M8 is an upland forested tract with moderately steep slopes, has 0.3 mi. perennial stream (Sperry Cr.), and is over 6 mi. to SSH in Rhea Creek. M12 is an upland forested parcel with moderately steep slopes, (0.02 mi perennial stream), and about 5 riverine miles to SSH in Butter Creek.
UM11, 62, 12	77/71	0.0	0.0	0.5	NLAA	Small upland forested parcels on moderate/gentle slopes. UM 11 and UM12 are 1.0 and 0.1 mi. to SSH in EF Butter Creek, and UM62 is 1.3 mi to SSH in Butcher Creek (Meacham Creek drainage).
Totals	**277/195**	**0.05 SSH**	**0.37**	**0.52**		

Note 1: **LAA** = Likely to Adversely Affect; **NLAA** = Not Likely to Adversely Affect
* Fish bearing and non fish bearing streams
**Non fish bearing
SSH= Suspected/Known Steelhead Spawning/Rearing Habitat
SWH= Steelhead Winter Rearing Habitat
SRH= Steelhead Summer Rearing Habitat

Table 13b: Acquisition Lands in the Umatilla River HUC (Currently Private)

BLM Acquisition Parcel #	Total Acres/ Timber Acres	Occupied Steelhead Trout Habitat (Miles)	Perennial Streams* (Miles)	Non-Perennial Streams** (Miles)	LAA, NLAA, Note 1	Rationale
No Acquisition lands in this Hydrologic Unit						It is likely that acquisition lands within this subbasin will be identified at a later time. Lands with occupied salmonid fish habitat or riparian areas are a high priority.
Totals						

Table 13c: Hydrologic Unit Summary of the Umatilla River HUC

Land Exchange Tracts	**Total Acres/ Timber Acres**	**Occupied Steelhead Trout Habitat (Miles)**	**Perennial Streams* (Miles)**	**Non-Perennial Streams** (Miles)**	**LAA, NLAA,** Note 1	**Rationale**
Net Change in Hydrological Unit	N/A	-0.05 SSH	-0.37	-0.52	NLAA	Very minor amount of occupied habitat lost within basin. Large net gains of habitat in other Mid-Columbia ESA subbasins mitigates this small loss in the Umatilla drainage.

Rational for Checklist Ratings of Effects for Population and Environmental Indicators (See Table 14) for Exchanging Range and Timber Lands in the North Fork John Day Subbasin. This focuses on affects to the following disposal stream segments; Cottonwood, W. F. Cochran, and Straight Creeks.

Water Temperature: Water temperatures influence steelhead trout distribution, abundance, and spawning success. Unsuitable temperatures can lead to disease outbreaks in migrating and spawning fish, altered timing of migration, and accelerated or retarded maturation.

Seasonal and temporal effects on water temperatures are out of human control. Stream temperatures can be altered by removal of streambank and floodplain vegetation, withdrawal and surface return of water for agriculture irrigation, and channelization (Bjornn and Reiser, 1991). If riparian canopy cover or vegetation is removed, and the stream is exposed to direct sunlight, water temperatures can be expected to increase more in summer than before the shade was removed.

No forested tracts proposed for disposal within this subbasin contain perennial streams. No effect to water temperatures is expected in stream reaches downstream of disposal forested tracts.
Livestock grazing is expected to continue on most disposal parcels. Livestock grazing can effect stream temperatures through removal of riparian vegetation, particularly on very small to medium sized streams (stream orders 1-5). The ability of plants to control stream temperature varies with their morphology. Grass crowns provide modest overhanging cover but grasses generally are too short to keep most solar radiation from reaching the water, except along very small streams (orders 1 and 2). The larger the stream, the higher the streamside vegetation must be to effectively intercept the sun's rays over water. In small to medium-size streams (orders 3-5) brush is sufficient to moderate water temperature but grasses and forbs have little effect (Platts, 1991). On sixth and seventh-order streams, only trees provide effective shading, and on still larger streams, vegetation has little moderating effect on stream temperature. Perennial streams on disposal tracts are typically very small to medium sized (stream orders 1-5). Because grazing management activities are not anticipated to change dramatically after lands are disposed to private management, water temperatures should not be degraded from their current conditions. There are 1.8 miles of perennial streams supporting SSH on three rangeland disposal tracts.

Sediment/Turbidity: It is difficult to predict how much a particular change in substrate composition will affect survival for any salmonid. Some substrates are more likely to accumulate fine sediments (less than 6.35 millimeters) than others, and some populations probably are more sensitive to substrate composition changes than others.

Land management activities that cause increases in fine sedimentation to steelhead trout spawning and rearing habitat will impact the current populations of the species more than when the activity only affects migratory or historic habitat.

No forested tracts proposed for disposal within this subbasin contain perennial streams. Timber harvest on most disposal tracts is not expected to have adverse sediment/turbidity effects to downstream reaches. Most timber tracts have moderate slopes, have some existing road access, and are 0.4 to 4.2 riverine miles to SSH downstream. Tract #714 may adversely affect sediment/turbidity levels downstream to SSH in Cottonwood Creek, 2.0 miles distant. See rationale presented in Table 9a.

Poor grazing management can effect the riparian environment by changing, reducing, or eliminating vegetation, and by actually eliminating riparian habitat through channel widening, channel aggrading, or lowering of the water table (Platts, 1991). Generally, in grazed areas, stream channels contain more fine sediment, streambanks are less stable, banks are less undercut, and summer water temperatures are higher than streams in ungrazed areas (Platts, 1991). Heavy grazing along streams leaves little residual bank vegetation, which is critical for trapping sediments and spreading floodwater velocities. Livestock may trample streambanks to bare soil. This increases streambank erosion and sediment delivery to streams during high flows.

Properly managed grazing is compatible with improving or maintaining streamside vegetative cover and streambank stability when carefully monitored. For example, short duration spring treatments in low-mid elevation riparian pastures generally maintain or improve riparian vegetation conditions. Adequate regrowth of the herbaceous component occurs to maintain streambank stability, disperse high flow water energy, and catch and deposit sediments. Because grazing management activities are not anticipated to change dramatically after lands are disposed to private management, sediment/turbidity levels should not be degraded from their current conditions.

Historically these tracts have been used annually for livestock grazing, and this use is presumed to continue after they are exchanged. Also, a concentrated effort to improve conditions on these tracts is not likely to significantly advance recovery of the species.

Chemical Contamination/Nutrients: No effect to these parameters is expected on these streams from current conditions.

Physical Barriers: No effect to this parameter is expected from predictable future private management activities.

Substrate Embeddedness: Potentially this parameter could be degraded in perennial stream segments below disposal forested tracts. The degree of degradation depends largely upon the chosen timber harvest method, the amount of road that is constructed in the process, and riverine distance from disposal tracts and downstream occupied habitats. This parameter should not be degraded on these BLM stream segments however, since they are rangeland tracts.

Large Wood: These streams will not affected or degraded from current conditions, for they are not in forested habitat.

Pool Frequency: No adverse effects to pool frequencies are expected because current vegetation will be maintained.

Pool Quality: No adverse effects to pool quality are expected because current vegetation will be maintained.

Off-Channel Habitat: No adverse effects to off-channel habitats are expected because no long term vegetation removal is occurring along these streams.

Refugia: These stream segments do not currently serve as refugia because of their small size and watershed position. This will not change after the land exchange.

Wetted Width/Max Depth Ratio: Because management practices on these streams is not expected to change, this parameter is not anticipated to be degraded from current conditions.

Streambank Condition: Because management practices on these streams is not expected to change, this parameter is not anticipated to be degraded from current conditions.

Floodplain Connectivity: Because management practices on these streams is not expected to change, this parameter is not anticipated to be degraded from current conditions.

Changes in Peak/Base Flow: The degree to which this parameter could be degraded depends on how much of the timber areas are harvested by clearcut. Partial cut units will maintain this parameter at current conditions. Harvested areas are expected to contain wetter soils after harvest during periods of evapotranspiration. This can lead to higher groundwater levels, and potentially, higher late-summer streamflows. This desirable effect lasts 3-5 years (in clearcut areas) until new root systems occupy the soil (Chanberlain, et al., 1991).

Drainage Network Increase: Minor changes are expected to the drainage network, and will be temporary. The degree to which this parameter could be degraded depends on how much new permanent road is constructed. No significant increase in drainage network is expected in this matrix analysis area.

Road Density and Location: Road densities will increase slightly within this matrix analysis area, but will likely will remain in the 2-3 miles per square mile range.

Disturbance History: Disturbance history (% ECA) will potentially be affected by this action, depending upon chosen harvest methods.

Riparian Reserves: As described in the environmental baseline section, no assessment of riparian potential has occurred. However, no perennial streams are present on timbered disposal tracts, so no effect on riparian vegetation communities is expected.

Table 14. Showing the checklist for documenting environmental base line and effects of **Exchanging Range and Timber Lands in the North Fork John Day Subbasin. This focuses on affects to the following disposal stream segments; Cottonwood, W. F. Cochran, and Straight Creeks.**

PATHWAYS: **INDICATORS**	**ENVIRONMENTAL BASELINE**			**EFFECTS OF THE ACTION(S)**		
	Properly Functioning	**At Risk**	**Not Properly Functioning**	**Restore**	**Maintain**	**Degrade**
Water Quality: Temperature		X	X		X	
Sediment		X			X	
Chem. Contam./Nut.	X				X	
Habitat Access: Physical Barriers	X				X	
Habitat Elements: Substrate		X			X	
Large Woody Debris		X	X		X	
Pool Frequency			X		X	
Pool Quality		X			X	
Off-Channel Habitat		X			X	
Refugia			X		X	
Channel Cond. & Dyn: Width/Depth Ratio			X		X	
Streambank Cond.		X			X	
Floodplain Connectivity		X			X	
Flow/Hydrology: Peak/Base Flows		X			X	
Drainage Network Increase		X	X		X	
Watershed Conditions: Road Dens. & Loc.		X	X		X	
Disturbance History	X				X	
Riparian Reserves	N/A			N/A		

Answers to the Dichotomous Key For Making ESA Determination of Effects for Exchanging range and timber lands in the North Fork John Day subbasin;

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

Yes, Summer Steelhead

2. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators?

Although 1.8 miles of SSH will be disposed in three tracts, these indicators are not expected to be degraded. Within the entire NFJDR subbasin, the exchange of lands will result in the BLM gaining 51.4 miles of occupied steelhead trout habitat (39.1 mi. SSH and 12.3 mi. SWH). When acquired, these stream miles will have more conservative management than under private. This management will emphasize the improvement/maintenance of cold water fish habitat, accomplished by implementing objectives in PACFISH and ESA consultations.

3. Does the proposed action(s) have the potential to result in "take" of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

There is a more than negligible probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of habitat on an individual tract analysis. Parcel G714 is 120 acres in size and contains 85 acres of commercial timber. See rationale in Table 9a. However, within the context of the NFJDR basin and NOALE proposal, the large net gain of occupied steelhead trout habitat (39.1 mi. SSH and 12.3 mi. SWH) makes this action **Not Likely to Adversely Affect** the species. When acquired, these stream miles will have more conservative management than under private. This management will emphasize the improvement/maintenance of cold water fish habitat, accomplished by implementing objectives in PACFISH and ESA consultations.

Acquisition of 47, 400 acres of mostly contiguous blocks of land (including about 8,800 acres of commercial forestlands) in the NFJDR subbasin may affect steelhead trout and it's habitat. Acquiring 39.1 miles of SSH and 12.3 miles SWH within the subbasin within blocked, manageable land parcels is expected to benefit the species over the long term with the application of a wide array of restoration management techniques.

Rational for Checklist Ratings of Effects for Population and Environmental Indicators (See Table 15) for <u>Exchanging Range and Timber Lands in the Middle Fork John Day Subbasin. This focuses on affects to the following disposal stream segments; the Middle Fork John Day River and tributaries including; Long, Jordan, Cole Canyon, Troff Canyon, and Threemile Creeks.</u>

Water Temperature: Forested BLM parcels proposed for exchange into private ownership are likely to be harvested within 10 years to the extent allowed under State Forestry Practices Act regulations. State harvest regulations require less protection of stream corridors than federal standards. Perennial streams within forested parcels could be affected by removal of trees that currently provide shade to them. Perennial stream segments that may be impacted from riparian vegetation removal during timber harvesting are short (range from 0.1 to 0.4 miles in length, and average 0.17 miles each on four tracts). Loss of stream shade on such small stream segments is unlikely to alter stream temperatures significantly enough to impact this habitat. Four partially forested parcels contain 0.2 mi. SSH, 0.4mi. SWH, and 0.1mi. SRH in the Middle Fork John Day River, Long Creek, and Cole Canyon Creek. Because timber volume is low on these parcels, harvest along the stream corridors is unlikely. And if harvested, no measurable impact to stream temperatures is anticipated because of the low canopy densities of the pine stands next to the streams.

Livestock grazing is expected to continue on most disposal parcels. Livestock grazing can effect stream temperatures through removal of riparian vegetation, particularly on very small to medium sized streams (stream orders 1-5). The ability of plants to control stream temperature varies with their morphology. Grass crowns provide modest overhanging cover but grasses generally are too short to keep most solar radiation from reaching the water, except along very small streams (orders 1 and 2). The larger the stream, the higher the streamside vegetation must be to effectively intercept the sun's rays over water. In small to medium-size streams (orders 3-5) brush is sufficient to moderate water temperature but grasses and forbs have little effect (Platts, 1991). On sixth and seventh-order streams, only trees provide effective shading, and on still larger streams, vegetation has little moderating effect on stream temperature. Perennial streams on disposal tracts are typically very small to medium sized (stream orders 1-5). Because grazing management activities are not anticipated to change dramatically after lands are disposed to private management, water temperatures should not be degraded from their current conditions. There is 1.0 mile of perennial streams supporting either SSH, SWH, or SRH (See Table 10a) on four partially forested and rangeland disposal tracts.

Sediment/Turbidity: See discussion under NFJDR subbasin rationale. The forested parcels that contain perennial streams are not expected to impact this parameter when harvested. This is because of the small amounts of timber next to the streams.

Chemical Contamination/Turbidity: There is the possibility of increased bacteria counts due to grazing. However, the spring use timing of grazing treatments help prevent cattle from concentrating use near riparian areas, as upland grasses are still green and palatable. Stream flows often are still elevated in April-June, diluting potential contaminates. No significant or measurable impact expected.

Physical Barriers: Grazing or timber harvest will not cause migration barriers:

Substrate Embeddedness: Potentially a small amount of sediment could enter the streams when cattle are watering. Regrowth of vegetation after the short use period will recover most areas trampled by livestock, thus minimizing areas that could by be subject to erosion during runoff or storm event flows. Potentially this parameter could be degraded in perennial stream segments below disposal forested tracts. The degree of degradation depends largely upon the chosen timber harvest method, the amount of road that is constructed in the process, and riverine distance from disposal tracts and downstream occupied habitats. Adverse downstream effects are not likely however, since little merchantable timber is present along parcels with perennial streams.

Large Wood: Current grazing systems are will maintain riparian vegetation by utilizing the area at the time of year when woody vegetation is less palatable. Grazing is not likely to limit development of future large wood to streams or affect current large wood sources potentially available to fall into streams. Adverse effects to large wood supplies are not likely, since little merchantable timber is present along parcels with perennial streams.

Pool Frequency: Because grazing and timber harvesting activities are not expected to adversely impact current or potential instream large wood, or streambank stability, no changes in pool frequencies is anticipated. Timber harvesting along perennial stream parcels is not likely to affect pool frequencies, since little merchantable timber is present along parcels with perennial streams.

Pool Quality: Because grazing and timber harvesting activities are not expected to adversely impact current or potential instream large wood, or streambank stability, no changes in pool quality is anticipated. Timber harvesting along perennial stream parcels is not likely to affect pool quality, since little merchantable timber is present along parcels with perennial streams. Regrowth of riparian vegetation after grazing use will buffer the stream from overland sediment delivery.

Off-Channel Habitat: Off channel habitat should not be affected by grazing or timber harvesting, because grazing actions are normally spring use, and little to any timber harvesting activities are expected within the riparian area.

Refugia: These are small stream segments that are unsuitable to be considered as refugia. Private management of these parcels should not change their suitability.

Wetted Width/Max Depth Ratio: Livestock concentration/trampling along these stream segments is minimized by the current grazing treatments. Therefore, streambank damage, which

causes and erosion and widening of stream channels, is not expected to occur. No adverse affects to this parameter are expected since little riparian harvest activity is anticipated.
Streambank Condition: Livestock concentration/trampling along these stream segments is minimized by the current grazing treatments. Therefore, streambank damage is not expected to occur. No adverse affects to this parameter are expected since little riparian harvest activity is anticipated.

Floodplain Connectivity: Grazing and timber management on disposal parcels will not effect floodplain function and connection to the stream during flood events. Minimal activities within perennial stream corridors is expected. Wetland areas and riparian vegetation will be maintained.

Changes in Peak/Base Flow: Grazing activities are not likely to cause changes to flow regimes. Disposal parcels are small in size and scattered. Harvesting these partially forested tracts is not likely to cause measurable changes to this parameter. This indicator is primarily affected by timber harvest practices (clearcutting) which alter snow retention and snowmelt timing. Clearcutting is not the dominant harvest method in these areas.

Drainage Network Increase: Grazing is not likely to effect the drainage network. Timber harvest on disposal parcels is not likely to cause a measurable increase to this parameter. Minimal new road construction is expected to harvest these parcels.

Road Density and Location: Road densities will not change with grazing management. Road densities are likely to increase, but will still remain in the 2-3 miles per square mile range.

Disturbance History: Because clearcutting is not a dominant harvest method on eastern Oregon forestlands, this parameter likely will remain less than 15% on these parcels. Disturbance history will not be effected by grazing management.

Riparian Reserves: As described in the environmental baseline section, no assessment of riparian potential has occurred. However, grazing practices are assumed to remain unchanged from the current management. Because timber volume is low on these parcels, harvest along the stream corridors is unlikely.

Table 15. Checklist for documenting environmental base line and effects of proposed actions on relevant indicators for **Exchanging Range and Timber Lands in the Middle Fork John Day Subbasin. This focuses on affects to the following disposal stream segments; M. F. John Day River, Long, Jordan, Cole Canyon, Troff Canyon, and Threemile Creeks**

PATHWAYS: **INDICATORS**	**ENVIRONMENTAL BASELINE**			**EFFECTS OF THE ACTION(S)**		
	Properly Functioning	**At Risk**	**Not Properly Functioning**	**Restore**	**Maintain**	**Degrade**
Water Quality: Temperature			X		X	
Sediment		X			X	
Chem. Contam./Nut.		X			X	
Habitat Access: Physical Barriers	X				X	
Habitat Elements: Substrate		X			X	
Large Woody Debris		X	X		X	
Pool Frequency			X		X	
Pool Quality		X			X	
Off-Channel Habitat			X		X	
Refugia			X		X	
Channel Cond. & Dyn: Width/Depth Ratio			X		X	
Streambank Cond.		X			X	
Floodplain Connectivity		X			X	
Flow/Hydrology: Peak/Base Flows	X				X	
Drainage Network Increase		X			X	
Watershed Conditions: Road Dens. & Loc.		X	X		X	
Disturbance History	X				X	
Riparian Reserves	N/A			N/A		

Answers to the Dichotomous Key For Making ESA Determination of Effects for Exchanging range and timber lands in the Middle Fork John Day subbasin.

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

Yes Summer Steelhead

2. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators?

Yes, disposal of 4 partially forested parcels (G24,28,34, and 708) with 0.7 total miles of perennial fish bearing streams could adversely affect water temperatures and streambank stability, depending on whether riparian areas are harvested. This chance is low however, since only about 10% of the total acres contain timber. Grazing management is not expected to change or affect the relevant properly functioning indicators.

3. Does the proposed action(s) have the potential to result in "take" of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

There is a more than negligible probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of habitat on an individual tract analysis. Parcels G24,28,34, and 708 total 1,120 acres and contains 102 acres of commercial timber. See rationale in Table 10a. At this time no lands within the MFJDR subbasin are proposed for acquisition.

Although there is a net loss of 1.0 miles of occupied steelhead habitat within the MFJDR subbasin, only 0.2 miles (on 2 tracts) reasonably may contain spawning habitat. Within the context of the NFJDR drainage, and the NOALE proposal, the large net gain of occupied steelhead trout habitat makes this action **Not Likely to Adversely Affect** the species. When acquired, these stream miles will have more conservative management than under private. This management will emphasize the improvement/maintenance of cold water fish habitat, accomplished by implementing objectives in PACFISH and ESA consultations. Large net gains of SSH and SWH in the John Day basin within blocked, manageable land parcels is expected to benefit the species over the long term with the application of a wide array of restoration management techniques.

Rational for Checklist Ratings of Effects for Population and Environmental Indicators (See Table 6a) for Exchanging range and timber lands in the Upper John Day River subbasin (excluding disposal lands in the South Fork John Day River drainage above Izee Falls) This focuses on affects to the following disposal stream segments; the John Day River and tributaries including; Bear, W. Fk Little Indian, Pine Bear Gulch, Grub, Hanscomb Cr. trib., Beech, Capsuttle, Warrens, West Dry, Marks, Flat, Franks, Belshaw, Creeks.

Water Temperature: Forested BLM parcels proposed for exchange into private ownership are likely to be harvested within 10 years to the extent allowed under State Forestry Practices Act regulations. State harvest regulations require less protection of stream corridors than federal standards. Loss of stream shade along perennial streams after timber harvesting may adversely affect downstream water temperatures. See rationale in Table 11a. Perennial stream segments that may be impacted from riparian vegetation removal during timber harvesting are short (range from 0.1 to 0.4 miles in length), and total 1.8 miles within 12 tracts.

Livestock grazing is expected to continue on most disposal parcels. Livestock grazing can effect stream temperatures through removal of riparian vegetation, particularly on very small to medium sized streams (stream orders 1-5). The ability of plants to control stream temperature varies with their morphology. Grass crowns provide modest overhanging cover but grasses generally are too short to keep most solar radiation from reaching the water, except along very small streams (orders 1 and 2). The larger the stream, the higher the streamside vegetation must be to effectively intercept the sun's rays over water. In small to medium-size streams (orders 3-5) brush is sufficient to moderate water temperature but grasses and forbs have little effect (Platts, 1991). On sixth and seventh-order streams, only trees provide effective shading, and on still larger streams, vegetation has little moderating effect on stream temperature. Perennial streams on disposal tracts are typically very small to medium sized (stream orders 1-5).

Because grazing management activities are not anticipated to change dramatically after lands are disposed to private management, water temperatures should not be degraded from their current conditions.

Sediment/Turbidity: Timber harvest on G43-45, 150a, 151a, 158-159, 161b, 186, 197, 205, and 219 may adversely affect sediment/turbidity levels to downstream reaches. Potential road building on these parcels may increase localized sediment delivery to occupied stream segments within them, or downstream.

Other forested parcels are not expected to adversely affect steelhead habitat because they are uplands with moderate slopes, have some existing road access, and are 0.1 to 3.0 riverine miles to SSH downstream via intermittent stream channels. See rationale in Table 11a, Row 2.

Potentially a small amount of sediment could enter the streams when cattle are watering. This amount of sediment should be insignificant and not degrade steelhead habitat.

Chemical Contamination/Nutrients: There is the slight possibility of increased bacteria counts due to grazing. Affects to current conditions for this parameter in occupied habitat are not expected to change from grazing or timber harvest.

Physical Barriers: Predicted activities on these parcels will not create migration barriers:

Substrate Embeddedness: See *sediment/turbidity* discussion for affects of assumed timber harvest. Potentially a small amount of sediment could enter the streams when cattle are watering. This amount of sediment should not be significant enough to measurably increase substrate embeddedness above current levels.

Large Wood: Future instream wood supplies could decrease along perennial stream segments in parcels G43-45, 150a, 151a, 158-159, 161b, 186, 197, and 205, depending upon harvest intensities. State Forestry regulations do require modest no cut buffers along fish bearing streams, and restricted harvest further out. This parameter should not be affected on other forested parcels.

Current grazing systems are established to protect riparian vegetation by utilizing the area at the time of year when woody vegetation is less palatable. Grazing will not limit development of future large wood to streams or affect current large wood sources potentially available to fall into streams.

Pool Frequency/Quality: Pool frequencies and quality are not expected to be affected from timber harvest in the short term. However these parameters may be degraded in the long term on parcels G43-45, 150a, 151a, 158-159, 161b, 186, 197, and 205, if future timber harvest removes trees within close proximity to existing perennial streams within these tracts. These parameters should not be affected on other forested parcels. Grazing management strategies are not expected to adversely impact current or potential instream large wood, or streambank stability, so changes to pool frequencies/quality is not likely.

Off-Channel Habitat: Due to the small size and moderate to steep gradient of these streams , little to no off channel habitat is expected to occur. **Not Applicable**

Refugia: Timber harvest in parcels G43-45, 150a, 151a, 158-159, 161b, 186, 197, and 205 could degrade this parameter. However stream segments within these parcels are too small to maintain viable sub-populations. These parameters should not be affected on other forested parcels. Grazing management should not degrade spawning, rearing, and migratory habitat for steelhead trout.

Wetted Width/Max Depth Ratio: Stream buffers set by State Forestry should be adequate to protect streambanks from mechanical damage from logging operations. Livestock grazing and trampling should not change from current conditions. Therefore, streambank damage, which causes and erosion and widening of stream channels, is not expected to occur.

Streambank Condition: Same as *Wetted Width/Max Depth Ratio* parameter.
Floodplain Connectivity: Because these streams are quite small, stream buffers set by State Forestry should be adequate to protect floodplain functioning. Grazing management will not effect floodplain function and connection to the stream during flood events. Wetland areas and riparian vegetation will be maintained.

Changes in Peak/Base Flow: It is difficult to assess if timber harvest activities disposal parcels will degrade this parameter on a subbasin scale. The likelihood is probably low. Grazing activities are not likely to cause changes to flow regimes. This indicator is primarily affected by timber harvest activities which alter snow retention and snowmelt timing.

Drainage Network Increase: Timber harvest activities will likely increase road densities, which raises the potential for drainage network increases. Ground disturbances associated with timber harvest also increase this risk. Timber harvest parcels are in scattered in various localities, which spreads the ground effects over a large area. Continuation of current grazing management will not effect the drainage network.

Road Density and Location: Timber harvest activities will likely increase road densities, but will still remain in the 2-3 miles per square mile range. Road densities will not change with grazing management.

Disturbance History: Because clearcutting is not a dominant harvest method on eastern Oregon forestlands, this parameter likely will remain less than 15% on these parcels. Disturbance history will not be effected by grazing management.

Riparian Reserves: As described in the environmental baseline section, no assessment of riparian potential has occurred. This parameter likely will be degraded on the following forested parcels; G43-45, 150a, 151a, 158-159, 161b, 186, 197, and 205. Other forested parcels are not likely to be degraded, however. This is a small component of stream miles within the subbasin. Grazing is not expected to degrade riparian reserves from current conditions.

Table 16. Showing the checklist for documenting environmental base line and effects of proposed actions on relevant indicators for **exchanging range and timber lands within the Upper John Day subbasin (excluding disposal lands in the South Fork John Day drainage). This focuses on affects to the following disposal stream segments; the John Day River and tributaries including; Bear, W. Fk Little Indian, Pine, Bear Gulch, Grub, Hanscomb Cr. trib., Beech, Capsuttle, Warrens, West Dry, Marks, Flat, Franks, and Belshaw Creeks**. *(Because this set of streams combines two environmental baseline groups, a baseline rating will not be shown in this table.)*

PATHWAYS: INDICATORS	**ENVIRONMENTAL BASELINE**			**EFFECTS OF THE ACTION(S)**		
	Properly Functioning	**At Risk**	**Not Properly Functioning**	**Restore**	**Maintain**	**Degrade**
Water Quality: Temperature					X	
Sediment					X	
Chem. Contam./Nut.					X	
Habitat Access: Physical Barriers					X	
Habitat Elements: Substrate					X	
Large Woody Debris					X	
Pool Frequency					X	
Pool Quality					X	
Off-Channel Habitat					X	
Refugia					X	
Channel Cond. & Dyn: Width/Depth Ratio					X	
Streambank Cond.					X	
Floodplain Connectivity					X	
Flow/Hydrology: Peak/Base Flows					X	
Drainage Network Increase					X	
Watershed Conditions: Road Dens. & Loc.					X	
Disturbance History					X	
Riparian Reserves					X	

Answers to the Dichotomous Key For Making ESA Determination of Effects for range and timber lands in the Upper John Day River subbasin (*Excluding disposal lands above Izee Falls in the Upper South Fork John Day River drainage*).

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

Yes Summer Steelhead

2. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators?

Yes, disposal of 12 forested parcels (G43-45, 150a, 151a, 158-159, 161b, 186, 197, and 205) with 1.8 total miles of perennial streams (1.0 mi. SSH), could degrade water temperatures and streambank stability, depending on harvest methods used near streams. This potential is minimized however, since only about 40% of the total acres contain timber, and State Forestry stream buffers will restrict tree removal and machinery impacts within 20-100 feet of salmonid streams. Grazing management is not expected to change or affect the relevant properly functioning indicators.

3. Does the proposed action(s) have the potential to result in "take" of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

There is a more than negligible probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of habitat on an individual tract analysis. Parcels G43-45, 150a, 151a, 158-159, 161b, 186, 197, and 205 total 2,320 acres and contain 945 acres of commercial timber. See effects rationale in Table 11a. However, within the context of the UJDR basin and the entire NOALE proposal, the net gain of occupied steelhead trout habitat (+0.6 mi. SSH and 0.2 mi. SRH) in the UJD subbasin makes this action **Not Likely to Adversely Affect** the species. When acquired, these stream miles will have more conservative management than under private. This management will emphasize the improvement/maintenance of cold water fish habitat, accomplished by implementing objectives in PACFISH and ESA consultations.

Acquisition of 4,700 acres of land that blocks into existing BLM lands in the SFJDR drainage (including about 3,100 acres of commercial forestlands) in the UJDR subbasin may affect steelhead trout and it's habitat. Acquiring 2.6 miles of SSH and 0.2 miles SRH within the subbasin within blocked, manageable land parcels is expected to benefit the species over the long term with the application of a wide array of restoration management techniques.

Rational for Checklist Ratings of Effects for Population and Environmental Indicators (See Table 6b) for Exchanging range and timber lands in the Upper John Day River subbasin above Izee Falls on the S. Fork John Day River drainage. This focuses on affects to the following disposal stream segments; the South Fork John Day River and tributaries including; Sock Hollow, Abbott, Flat, Utley, Delles, Packwood, and Tamarack Creeks. *Streams in this list are upstream of a natural barrier to steelhead trout (Izee Falls), and are occupied by redband trout and non-game species only. Stream parcels on BLM lands are 8.0 to 30 riverine miles upstream of occupied steelhead habitat.*

Water Temperature: Partially forested BLM parcels proposed for exchange into private ownership are likely to be harvested within 10 years to the extent allowed under State Forestry Practices Act regulations. State harvest regulations require less protection of stream corridors than federal standards. Timber harvesting adjacent to perennial streams should be minimal, since these tracts are only partially forested (341ac. out of 2,040 total ac). Loss of stream shade along perennial streams after timber harvesting is unlikely to degrade this parameter 13-25 miles downstream in the SFJDR. See rationale in Table 11c. Livestock grazing will not degrade this parameter in occupied habitat 8-20 miles downstream.

Sediment/Turbidity: Potential road building may increase localized sedimentation. It is not likely that occupied habitats will be degraded from timber harvesting partially forested tracts 13-25 miles upstream. These streams generally have moderate to high turbidity levels, particularly on the South Fork John Day River. Potentially small amounts of sediment could enter streams when cattle are watering. This amount of sediment should be insignificant and not degrade occupied steelhead habitat, which is 8-30 miles downstream in the SFJDR.

Chemical Contamination/Nutrients: Affects to current condition of occupied habitats are not expected to change from grazing or timber harvest activities on disposal parcels 8-30 miles upstream. Stream flows in the SFJDR are normally high enough to provide sufficient dilution.

Physical Barriers: These stream segments upstream of Izee Falls and not accessible to steelhead trout. Not Applicable.

Substrate Embeddedness: Affects to current condition of occupied habitats are not expected to change from grazing or timber harvest activities on disposal parcels 8-25 miles upstream. Potential sediment increases from timber harvesting should not be significant enough to measurably increase substrate embeddedness to steelhead habitats 13-25 miles downstream.

Large Wood: Disposal parcels with perennial streams and resident fish habitat are 8-25 miles upstream of occupied steelhead habitat. Grazing and timber harvest activities will not affect large wood supplies occupied habitats 8-25 miles downstream.

Pool Frequency: These stream segments are not accessible by steelhead trout. Not Applicable.

Pool Quality: These stream segments are not accessible by steelhead trout. Not Applicable.

Off-Channel Habitat: These stream segments are not accessible by steelhead trout. Not Applicable.

Refugia: These stream segments are not accessible by steelhead trout. Not Applicable.

Wetted Width/Max Depth Ratio: These stream segments are not accessible by steelhead trout. Not Applicable.

Streambank Condition: These stream segments are not accessible by steelhead trout. Not Applicable.

Floodplain Connectivity: These stream segments are not accessible by steelhead trout. Not Applicable.

Changes in Peak/Base Flow: These grazing and timber harvest activities are not likely to cause changes to flow regimes that could affect occupied steelhead habitat 8-25 miles downstream. This indicator is primarily affected by clearcut timber harvest activities which alter snow retention and snowmelt timing.

Drainage Network Increase: Grazing will not effect the drainage network.

Road Density and Location: Potentially road densities will increase in the drainage, but will remain less than 3 miles per square mile. Road densities will not change with grazing management.

Disturbance History: This parameter may be affected slightly. However, clearcutting is not a dominant harvest method on eastern Oregon forestlands, so this parameter likely will remain less than 15% on these parcels. Disturbance history will not be affected by grazing management.

Riparian Reserves: As described in the environmental baseline section, no assessment of riparian potential has occurred. These stream segments are not accessible by steelhead trout. Not Applicable.

Table 17. Showing the checklist for documenting environmental base line and effects of **exchanging range and timber lands within the Upper John Day subbasin** on relevant indicators for following steams; **South Fork John Day River and tributaries; Sock Hollow, Abbott, Flat, Utley, Delles, Packwood, and Tamarack Creeks.**

PATHWAYS: INDICATORS	**ENVIRONMENTAL BASELINE**			**EFFECTS OF THE ACTION(S)**		
	Properly Functioning	**At Risk**	**Not Properly Functioning**	**Restore**	**Maintain**	**Degrade**
Water Quality: Temperature			X		X	
Sediment		X	X		X	
Chem. Contam./Nut.		X			X	
Habitat Access: Physical Barriers	N/A				X	
Habitat Elements: Substrate		X	X		X	
Large Woody Debris			X		N/A	
Pool Frequency			X		N/A	
Pool Quality		X			N/A	
Off-Channel Habitat		X			NA	
Refugia	N/A				N/A	
Channel Cond. & Dyn: Width/Depth Ratio		X			N/A	
Streambank Cond.		X			N/A	
Floodplain Connectivity	X	X			N/A	
Flow/Hydrology: Peak/Base Flows		X			X	
Drainage Network Increase		X			X	
Watershed Conditions: Road Dens. & Loc.		X			X	
Disturbance History	X				X	
Riparian Reserves	N/A			N/A		

Answers to the Dichotomous Key For Making ESA Determination of Effects for Exchanging Range and Timber Lands in South Fork John Day River drainage above Izee Falls. *This group of disposal parcels are upstream of a natural barrier to steelhead trout (Izee Falls), and streams on them are occupied by redband trout and non-game species only. Stream parcels on BLM lands are 8.0 to 30 riverine miles upstream of occupied steelhead habitat.*

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

Yes, Summer Steelhead occupy the S. Fork John Day River, below Izee Falls

2. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators?

No, the potential actions should not degrade habitat parameters on occupied habitat below Izee Falls.

3. Does the proposed action(s) have the potential to result in "take" of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

No, grazing and timber harvest activities that will likely occur on disposal parcels are not adjacent to occupied steelhead habitat, and are 8-25 riverine miles upstream. There is less than a negligible probability of take of proposed/listed anadromous salmonids. Although 1.8 miles of perennial streams are within forested parcels, timber densities are light (341 on 5,500 acres), so minimal affects to riparian habitats is expected.

See effects rationale in Table 11B. Within the context of the UJDR basin and the entire NOALE proposal, the net gain of occupied steelhead trout habitat (+0.6 mi. SSH and 0.2 mi. SRH) in the subbasin makes this action **Not Likely to Adversely Affect** the species. When acquired, these stream miles will have more conservative management than under private. This management will emphasize the improvement/maintenance of cold water fish habitat, accomplished by implementing objectives in PACFISH and ESA consultations.

Acquisition of 4,500 acres of land that blocks into existing BLM lands in the SFJDR drainage (including about 3,100 acres of commercial forestlands) in the UJDR subbasin may affect steelhead trout and it's habitat. Acquiring 2.6 miles of SSH in the SFJDR drainage on blocked, manageable land parcels is expected to benefit the species over the long term with the application of a wide array of restoration management techniques.

Rational for Checklist Ratings of Effects for Population and Environmental Indicators for Exchanging Range and Timber lands in the Lower John Day River Basin. This focuses on affects to the following disposal stream segments; Kahler and Little Searcy Creeks.

Water Temperature: Forested BLM parcels proposed for exchange into private ownership are likely to be harvested within 10 years to the extent allowed under State Forestry Practices Act regulations. State harvest regulations require less protection of stream corridors than federal standards. Loss of stream shade along perennial streams after timber harvesting may degrade downstream water temperatures. See rationale in Table 12a. One parcel (W4)contains 0.3 miles of Little Searcy Creek, a perennial stream. Water temperature may be impacted from riparian vegetation removal during timber harvesting. Little Searcy Creek is a non fish-bearing stream, 1.8 riverine miles upstream of SSH in Thirtymile Creek. Other forested parcels do not contain perennial streams, and will not degrade downstream water temperatures.

Because grazing management activities are not anticipated to change dramatically after lands are disposed to private management, water temperatures should not be degraded from their current conditions. W37 is a rangeland parcel that contains 0.05 miles of SSH in Kahler Creek.

Sediment/Turbidity: Timber harvest on W4 may adversely affect sediment/turbidity levels to downstream reaches. Potential road building on these parcels may increase localized sediment delivery to occupied stream segments downstream.

Other forested parcels are not expected to adversely affect steelhead habitat because they are uplands with moderate slopes, have some existing road access, and are 0.3 to 4.0 riverine miles to SSH downstream via intermittent stream channels. See rationale in Table 12a, Row 2.

Potentially a small amount of sediment could enter the streams when cattle are watering. This amount of sediment should be insignificant and not degrade steelhead habitat.

Chemical Contamination/Nutrients: There is the slight possibility of increased bacteria counts due to grazing. Affects to current conditions for this parameter in occupied habitat are not expected to change from grazing or timber harvest.

Physical Barriers: Predicted activities on these parcels will not create migration barriers:

Substrate Embeddedness: See *sediment/turbidity* discussion for affects of assumed timber harvest. Potentially a small amount of sediment could enter the streams when cattle are watering. This amount of sediment should not be significant enough to measurably increase substrate embeddedness above current levels.

Large Wood: Future instream wood supplies could decrease along Little Searcy Creek in parcel W4 depending upon harvest intensities. This could potentially decrease future quantities of instream large wood. This parameter should not be affected on other forested parcels.

Grazing should not limit development of future large wood to streams or affect current large wood sources potentially available to fall into streams.

Pool Frequency/Quality: Pool frequencies and quality are not expected to be affected from timber harvest in the short term. However these parameters may be degraded in the long term on parcel W4, if future timber harvest removes trees within close proximity to existing perennial streams within these tracts. This is not expected to impact occupied habitat downstream however. These parameters should not be affected on other forested parcels. Grazing management strategies are not expected to adversely impact current or potential instream large wood, or streambank stability, so changes to pool frequencies/quality is not likely.

Off-Channel Habitat: Due to the small size and moderate to steep gradient of these streams , little to no off channel habitat is expected to occur. **Not Applicable**

Refugia: These lands do not have suitable refugia habitat. **Not Applicable**

Wetted Width/Max Depth Ratio: Timber harvest activities adjacent to this creek could degrade this parameter by mechanical damage from logging operations. Because some streambank damage may occur, erosion and widening of the stream channel may result. Affects to downstream occupied habitat is unlikely though. Livestock grazing and trampling should not change this parameter from current conditions.

Streambank Condition: Same as *Wetted Width/Max Depth Ratio* parameter.

Floodplain Connectivity: Because this streams is a small, first order stream, timber harvest and grazing activities are not expected to impair floodplain function/connectivity.

Changes in Peak/Base Flow: It is difficult to assess if timber harvest activities disposal parcels will degrade this parameter on a subbasin scale. The likelihood is quite low. Grazing activities are not likely to cause changes to flow regimes. This indicator is primarily affected by timber harvest activities which alter snow retention and snowmelt timing.

Drainage Network Increase: Timber harvest activities may increase road densities slightly, which raises the potential for drainage network increases. Ground disturbances associated with timber harvest also increase this risk. Timber harvest parcels are in scattered in various localities, which spreads the ground effects over a large area. Continuation of current grazing management will not effect the drainage network.

Road Density and Location: Timber harvest activities may increase road densities slightly, but will still remain in the 2-3 miles per square mile range. Road densities will not change with grazing management.

Disturbance History: Because clearcutting is not a dominant harvest method on eastern Oregon forestlands, this parameter likely will remain less than 15% on these parcels. Disturbance history will not be effected by grazing management.

Riparian Reserves: As described in the environmental baseline section, no assessment of riparian potential has occurred. This parameter likely will be degraded on W4, the only forested parcel with perennial water. All other forested parcels are not likely to be degraded, because they do not have riparian habitat. This is a small component of stream miles within the subbasin. Grazing is not expected to degrade riparian reserves from current conditions.

Table 18. Checklist for documenting environmental baseline conditions, and effects on relevant indicators, from **exchanging range and timber lands in the Lower John Day River Subbasin.**

PATHWAYS: INDICATORS	**ENVIRONMENTAL BASELINE**			**EFFECTS OF THE ACTION(S)**		
	Properly Functioning	**At Risk**	**Not Properly Functioning**	**Restore**	**Maintain**	**Degrade**
Water Quality: Temperature			**X**		**X**	
Sediment			**X**		**X**	
Chem. Contam./Nut.	**X**				**X**	
Habitat Access: Physical Barriers		**X**			**X**	
Habitat Elements: Substrate		**X**			**X**	
Large Woody Debris			**X**		**X**	
Pool Frequency			**X**		**X**	
Pool Quality		**X**			**X**	
Off-Channel Habitat		**X**			**N/A**	
Refugia		**X**			**N/A**	
Channel Cond. & Dyn: Width/Depth Ratio		**X**			**X**	
Streambank Cond.			**X**		**X**	
Floodplain Connectivity		**X**			**X**	
Flow/Hydrology: Peak/Base Flows		**X**			**X**	
Drainage Network Increase	**X**				**X**	
Watershed Conditions: Road Dens. & Loc.		**X**			**X**	
Disturbance History	**X**				**X**	
Riparian Reserves	**N/A**				**N/A**	

Answers to the Dichotomous Key For Making ESA Determination of Effects for Exchanging Range and Timber Lands in the Lower John Day River subbasin

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

Yes Summer Steelhead

2. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators?

Yes, disposal of 1 forested parcel (W4) with 0.3 miles of perennial streams (non fish-bearing), could degrade downstream water temperatures and streambank stability, depending on harvest methods used.

3. Does the proposed action(s) have the potential to result in "take" of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

There is a more than negligible probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of habitat on an individual tract analysis. Disposal of a 40 acre forested parcel (W4) with 0.3 miles of perennial streams (non fish-bearing), could degrade downstream water temperatures and streambank stability, depending on harvest methods used. The potential to adversely affect the species is minimized however, since the tract is 1.8 riverine miles upstream of SSH in Thirtymile Creek. Grazing management is not expected to change or affect the relevant properly functioning indicators. See effects rationale in Table 12a.

Within the subbasin, the BLM would incur a net loss of 0.05 miles of SSH. No lands in the Lower John Day River subbasin are proposed for acquisition at this time. However, within the context of the entire NOALE proposal, the large net gain of occupied steelhead trout habitat in the John Day basin makes this action **Not Likely to Adversely Affect** the species. When acquired, stream miles in the NFJDR and UJDR subbasins will have more conservative management than under private. This management will emphasize improvement/maintenance of cold water fish habitat, accomplished by implementing objectives in PACFISH and ESA consultations.

Rational for Checklist Ratings of Effects for Population and Environmental Indicators for Exchanging May Affect Timber lands in the Umatilla River Basin. This focuses on affects to the following disposal stream segments; Sawmill Canyon, East Fork Butter, and Sperry Creeks.

Water Temperature: Forested BLM parcels proposed for exchange into private ownership are likely to be harvested within 10 years to the extent allowed under State Forestry Practices Act regulations. Water temperatures may be impacted from tree removal near streams during timber harvesting. One parcel (UM10) contains 0.05 miles of E. F. Butter Creek, a perennial stream. E. F. Butter Creek is considered to be a SSH stream. State harvest regulations require less protection of stream corridors than federal standards, but stream buffers, and harvest restrictions within 20-100 feet of fish bearing streams do provide some riparian protection. Loss of stream shade along perennial streams after timber harvesting may degrade downstream water temperatures. See rationale in Table 13a.

Parcels M8 and M12 contain short perennial stream segments (0.3 and 0.02 mi.) that are non fish bearing. Because of their short length and riverine distance to occupied habitat (5-6 miles), this parameter should not be degraded within occupied habitat. Other May Affect forested parcels (UM11, 12, and 62) will not degrade this parameter, since they do not contain perennial streams.

Because grazing management activities are not anticipated to change dramatically after lands are disposed to private management, water temperatures should not be degraded from their current conditions.

Sediment/Turbidity: Timber harvest on UM10, M8, and M12 may degrade sediment/turbidity levels. Stream buffers set by State Forestry on E.F. Butter Creek (UM10 - fish bearing) will provide some protection to protect streambanks from mechanical damage from logging operations. This parameter should not be degraded in occupied habitats which lie 5-6 miles down stream from M8 and M12. Potential road building on these parcels may increase some localized sedimentation.

Other forested parcels are not expected to adversely affect steelhead habitat because they are small upland parcels with moderate slopes, have some existing road access, and are 0.1 to 1.3 riverine miles to SSH downstream via intermittent stream channels. See rationale in Table 13a, Row 3.

Potentially a small amount of sediment could enter the streams when cattle are watering. This amount of sediment should be insignificant and not degrade steelhead habitat.

Chemical Contamination/Nutrients: There is the slight possibility of increased bacteria counts due to grazing. Affects to current conditions for this parameter in occupied habitat are not expected to change from grazing or timber harvest.

Physical Barriers: Predicted activities on these parcels will not create migration barriers:
Substrate Embeddedness: See *sediment/turbidity* discussion for affects of assumed timber harvest. Potentially a small amount of sediment could enter the streams when cattle are

watering. This amount of sediment should not be significant enough to measurably increase substrate embeddedness above current levels.

Large Wood: Future instream wood supplies could decrease along E.F. Butter Creek in parcel UM10, Sperry and Sawmill Canyon Creeks (M8 and M12) depending upon harvest intensities. This could potentially decrease future quantities of instream large wood. This parameter should not be affected on other forested parcels.

Grazing should not limit development of future large wood to streams or affect current large wood sources potentially available to fall into streams.

Pool Frequency/Quality: Pool frequencies and quality are not expected to be affected from timber harvest in the short term. Stream buffers set by State Forestry on E.F. Butter Creek (UM10 - fish bearing) will provide some protection, leaving some future supplies of instream wood. However these parameters may be degraded in the long term on parcel UM10, if residual trees are not adequate in quantity and size to maintain this indicator. This is not expected to impact occupied habitat downstream however. These parameters should not be affected on other forested parcels. Grazing management strategies are not expected to adversely impact current or potential instream large wood, or streambank stability, so changes to pool frequencies/quality is not likely.

Off-Channel Habitat: Due to the small size and moderate to steep gradient of these streams , little to no off channel habitat is expected to occur. **Not Applicable**

Refugia: These lands do not contain long enough stream segments suitable for refugia habitat. **Not Applicable**

Wetted Width/Max Depth Ratio: Timber harvest activities adjacent to this creek could degrade this parameter by mechanical damage from logging operations. Stream buffers set by State Forestry on E.F. Butter Creek (UM10 - fish bearing) will provide some protection to protect streambanks from mechanical damage from logging operations. This parameter may be degraded slightly on M8 and M12. Because some streambank damage may occur, erosion and widening of the stream channel may result. Affects to occupied habitat 5-6 miles downstream is unlikely though. Livestock grazing and trampling should not change this parameter from current conditions.

Streambank Condition: Same as *Wetted Width/Max Depth Ratio* parameter.

Floodplain Connectivity: Because these streams are small, first and second order streams, timber harvest and grazing activities are not expected to impair floodplain function/connectivity.

Changes in Peak/Base Flow: It is difficult to assess if timber harvest activities disposal parcels will degrade this parameter on a subbasin scale. The likelihood is quite low. Grazing activities are not likely to cause changes to flow regimes. This indicator is primarily affected by timber harvest activities which alter snow retention and snowmelt timing. Tracts are also spread out over a large area including several 6th field HUC's.

Drainage Network Increase: Timber harvest activities may increase road densities slightly, which could raise potential drainage networks. Ground disturbances associated with timber harvest also increase this risk. Timber harvest parcels are in scattered in various localities, which separates parcel ground effects over a larger geographical area. Continuation of current grazing management should not effect the drainage network.

Road Density and Location: Timber harvest activities may increase road densities slightly, but likely will remain in the 2-3 miles per square mile range. Road densities will not change with grazing management.

Disturbance History: Because clearcutting is not a dominant harvest method on eastern Oregon forestlands, this parameter likely will remain less than 15% on these parcels. Disturbance history will not be effected by grazing management.

Riparian Reserves: As described in the environmental baseline section, no assessment of riparian potential has occurred. This parameter likely will be degraded on M8 and M12, forested parcels with perennial non fish bearing streams. State Forestry stream buffers will provide some protection from timber cutting along the E.F. Butter Creek in UM10, which has occupied steelhead habitat. All other forested parcels are not likely to be degraded, because they do not have riparian habitat. This is a small component of stream miles within the subbasin. Grazing is not expected to degrade riparian reserves from current conditions.

Table 18. Checklist for documenting environmental baseline conditions, and effects on relevant indicators, from **exchanging timber lands in the Umatilla River Subbasin.**

PATHWAYS: **INDICATORS**	**ENVIRONMENTAL BASELINE**			**EFFECTS OF THE ACTION(S)**		
	Properly Functioning	**At Risk**	**Not Properly Functioning**	**Restore**	**Maintain**	**Degrade**
Water Quality: Temperature		**X**			**X**	
Sediment		**X**			**X**	
Chem. Contam./Nut.		**X**			**X**	
Habitat Access: Physical Barriers	**X**				**X**	
Habitat Elements: Substrate		**X**			**X**	
Large Woody Debris		**X**			**X**	
Pool Frequency		**X**			**X**	
Pool Quality		**X**			**X**	
Off-Channel Habitat	**N/A**				**N/A**	
Refugia	**N/A**				**N/A**	
Channel Cond. & Dyn: Width/Depth Ratio		**X**			**X**	
Streambank Cond.		**X**			**X**	
Floodplain Connectivity		**X**			**X**	
Flow/Hydrology: Peak/Base Flows		**X**			**X**	
Drainage Network Increase		**X**			**X**	
Watershed Conditions: Road Dens. & Loc.		**X**			**X**	
Disturbance History	**X**				**X**	
Riparian Reserves	**N/A**				**N/A**	

Answers to the Dichotomous Key For Making ESA Determination of Effects for Exchanging Timber Lands in the Umatilla River subbasin

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

Yes Summer Steelhead

2. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators?

Yes, disposal of 1 forested parcel (UM10) with 0.05 miles of perennial streams (fish-bearing), and 2 forested parcels (M8 and M12) with 0.32 miles of perennial streams (non fish-bearing) could slightly degrade downstream water temperatures and streambank stability, depending on harvest methods used.

3. Does the proposed action(s) have the potential to result in "take" of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

There is a more than negligible probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of habitat on an individual tract analysis. Disposal of a 2 forested parcels (M8 and M12) with 0.32 miles of perennial streams (non fish-bearing), could degrade downstream water temperatures and streambank stability, depending on harvest methods used. The potential to adversely affect the species is minimized however, since these tracts are both over 5.0 riverine miles upstream of SSH in Rhea and Butter Creeks. Disposal of 1 forested parcel (UM10) with 0.05 miles of E.F. Butter Creek (SSH) could degrade water temperatures and streambank stability, depending on harvest methods used near the streams. This potential is minimized however, since State Forestry stream buffers will restrict tree removal and machinery impacts within 20-100 feet of salmonid streams. Grazing management is not expected to change or affect the relevant properly functioning indicators. See effects rationale in Table 13a.

Within the subbasin, the BLM would incur a net loss of 0.05 miles of SSH. No lands in the Umatilla River subbasin are proposed for acquisition yet. However, within the context of the entire NOALE proposal, the large net gain of occupied steelhead trout habitat within the Mid Columbia ESU makes this action **Not Likely to Adversely Affect** the species. When acquired, stream miles in the NFJDR and UJDR subbasins will have more conservative management than under private. This management will emphasize improvement/maintenance of cold water fish habitat, accomplished by implementing objectives in PACFISH and ESA consultations.

Cumulative Effects

Forest Health and Timber Harvesting

Forests east of the Cascade Mountains in Oregon have suffered from widespead insect and disease epidemics that are causing damage to forest resources and creating critically high fuel loading levels. Suppression of natural wildfires in forests in this century has contributed to an overall decline in forest health. Multiple pest attacks, combined with drought conditions have caused increased tree mortality. Many resource values are at risk when forest health conditions are in decline. Conditions have worsened considerably since the drought years of mid 1980's.

It is recognized that the declining forest health in the Blue Mountains is a serious problem needing prompt attention. Preventative measures (thinning, salvage operations) are needed to improve the health on federal forestlands and reduce future timber resource losses. The BLM is a minor manager of forestlands in the two basins, but is active in thinning overstocked forest stands to favor re-establishment of pine dominated/fire dependant ecosystems.

Since the early 1990's, timber sales on federal lands in eastern Oregon have declined significantly, in response to increased protection for fisheries habitats (PacFish, InFish), old growth forest stands, and because of increased litigation by environmental protection groups. Reduction of public timber being offered on the market has reduced lumber supplies, and increased prices of lumber. Higher lumber prices has precipitated many private timberland owners to cut more of their lands to meet market demands. Generally, timber harvest on private lands results in greater environmental impacts because State Forestry regulations are much less restrictive than Federal requirements. Federal land managers must comply with National Environmental Protection Act, Federal Land Policy Management Act, Endangered Species Act, Pacfish, and soon guidelines provided by the Interior Columbia Basin Ecosystem Management Project.

Increased timber harvesting on private lands to meet market demands has likely increased road densities, soil exposure, and sedimentation to streams in all hydrologic units. Degradation of riparian habitat has occurred on public and private lands in all hydrologic units due to timber harvest and road construction in or near riparian habitats. Increased levels of timber harvesting on private lands within the analysis area will likely continue as long as lumber prices remain high. Logging on private lands is primarily influenced by maximizing economic returns, and to a much lesser extent, improving forest health, and protecting and enhancing wildlife habitats.

Potential timber management on public lands, following disposal to private parties, likely will degrade conditions of some fish-bearing streams and tributary fishless streams. This factor will be mitigated within the Mid-Columbia steelhead trout ESU by acquiring a large net gain (51 miles) of occupied steelhead habitat under federal management. Federal management of riparian areas and fish habitat will increase protection of stream corridors from timber harvest activities.

Roads

Forest and rangeland roads can degrade salmonid habitats in streams, and rarely can roads be built that have no negative effect on streams (Furniss et al. 1991). Roads modify natural drainage networks and accelerate erosion processes. These changes can alter physical processes in stream, leading to changes in streamflow regimes, sediment transport and storage, channel bank and bed configurations, substrate composition, and stability of slopes adjacent to streams (Furniss et al. 1991).

Construction of a road network can lead to greatly accelerated erosion rates in a watershed, and increased sedimentation in streams following road construction can be significant and long lasting (Furniss et al. 1991). Sediment entering streams is delivered chiefly by mass soil movements and surface erosion processes. Failure of stream crossings, diversions of streams by roads, washout of road fills, and accelerated scour at culvert outlets are also important sources of sedimentation in streams within roaded watersheds (Furniss et al. 1991).

Extensive road networks on forest and rangelands have been constructed in the subbasin areas in the last 120 years. Many streams on public and private lands, outside of designated Wilderness Areas, have roads adjacent to them. Often these roads were built inside the active floodplain, encroaching on the streams ability to move laterally. Further degradation occurs from hard structure bank armoring after road segments are washed out by lateral stream migrations. Riparian vegetation may be replaced by road surface or sidecast materials, which increases warming of the water and reduces potential large wood recruitment.

To minimize or prevent damage to stream habitats from road construction and maintenance, keep road disturbances as far from streams as possible, and provide buffers of relatively undisturbed land between roads and streams. Avoid midslope road locations in favor of higher, flatter areas. Ridgetop roads usually have the least effect on streams (Furniss et al. 1991).

Since the late 1980's, there has been increasing timber harvest on private lands in the basins in response to favorable lumber prices and declining federal timber volume available. This has led to increased road building activities on private lands. There is little control on road construction/maintenance or use on private lands. Under State Forestry Practices Act, landowners are encouraged to minimize road construction to meet their harvest objectives. In general road densities on private forest lands usually exceed what is considered acceptable on Federal forestlands.

Potential timber management/road construction on public lands, following disposal to private parties, may degrade conditions of some fish-bearing streams and tributary fishless streams. This factor will be mitigated within the Mid-Columbia steelhead trout

ESU by acquiring over 10,000 acres of commercial forest lands (about 2,900 acre net gain) into federal management. These acquired timberlands are primarily blocked, contiguous lands, with adjacency to National Forest lands. Federal management of timber lands will increase watershed protection, through a more conservative approach to road construction and increased emphasis on watershed restoration, through various means.

Livestock Grazing

Livestock grazing is widespread across the analysis area on private and public lands. Impacts from grazing on riparian habitat vary by from individual operators/lessees, but all have impacts. The cumulative impact of these operations, although not quantified are probably significant.

Livestock commonly congregate along stream corridors where water, forage and shade are initially abundant in the season. No statutory regulations exist that provide protection for riparian habitat within private lands managed for non-timber use. When improperly managed, concentrations of livestock along waterways can destroy streamside vegetation, cause soil compaction, accelerate erosion and breakdown of streambanks, and impact water quality. Accelerated erosion and unstable streambanks increase delivery and deposition of fine sediments in spawning and rearing habitats of bull trout and other salmonids.

The cumulative impact of livestock grazing activities in riparian habitats continues to be a limiting factor to fish production on private lands, and also on public lands. BLM administers grazing on many small parcels within the basins, but in many cases has a minor influence on the overall grazing systems that include small plots of public lands within greater expanses of private properties. Using the values of scattered, small, rangeland disposal parcels to acquire larger areas will benefit watershed and fishery resources. Intensive grazing treatment can be implemented that benefit upland and riparian function, which will benefit instream habitat conditions for salmonids.

Recreational Activities

Recreation opportunities within the analysis area includes rafting, fishing, hunting, camping, picnicking, scenic viewing, horseback riding/camping, hiking, bicycling, swimming, ATV and motorcycle riding, and wilderness camping. The National Forests host a wide range of outdoor recreation opportunities, more limited opportunities are available on BLM lands, and private lands offer little to the general public, as most ranches are off limits to everyone except invited guests.

Developed recreation opportunities are found in campgrounds, picnic areas, boat launching sites, resorts, recreation homes, and other constructed facilities. Trampling of vegetation and compaction of soils occur at heavily used recreation sites. Facilities near water tend to contribute to bacterial pollution. Campgrounds near steelhead trout spawning/rearing streams may increase harassment or illegal take of individuals.

Dispersed recreation opportunities occur on most National Forest and BLM lands and some private lands. Impacts from dispersed recreation include human waste problems near water, littering, trampling of riparian vegetation, and harassment or illegal take of fish.
Float boating/rafting is a popular activity that occurs on the North Fork John Day River, and there appears to be increasing numbers of river users each year. Floating conditions on the river are best between April and June, when flows are high enough. Incidental power boat activity occurs as well.

Steelhead fishing within both basins is managed by the Oregon Department of Fish and Wildlife. In the John Day Basin, steelhead fishing occurs mainly from late fall to mid April, and likely is associated with float/drift and power boating on the North Fork John Day. Acquiring large blocks of land along the North Fork may increase visitors using the area and anglers floating the river. More steelhead fishing on the North Fork (because of better access and camping opportunities) may result in higher incidental catch and hooking mortalities on adult steelhead and migratory bull trout. All wild steelhead trout caught by anglers must be released unharmed, according to State of Oregon game laws.

Mining

Cumulative effects of mining activities on bull trout habitat are largely the result of past habitat disturbances in the upper North, Middle and Mainstem John Day reaches that are slowly recovering towards more natural conditions. Extensive placer and dredge mining in the 1800's and early 1900's for gold essentially turned stream reaches in the upper John Day Basin upside down. These operations had severe impacts to fish habitat as streams were diverted, dredged, channelized, and stripped of vegetative cover. Mining claims and instream disturbances occurred on private and public lands alike. The upper reaches of the North Fork (primarily on National Forest) was heavily impacted from placer mining, leaving miles of habitat impacted from large dredge piles that prevented natural floodplain function. Some placer mining claims remain active today, although at a much smaller scale however. Recreational miners/gold panners contribute small local impacts in the basin, mainly on National Forest lands and limited amounts on BLM.

The Umatilla Basin has had relatively little mining activity, and thus little impact to steelhead trout habitat from mining activities. Aggregate is likely the most common surface mining activity in the basin. Excavation of aggregate pits could, if adjacent to streams cause sedimentation and loss of riparian vegetation.

Determination

Within the two river basin's are 4.8 miles of perennial streams, supporting occupied steelhead trout habitat (3.9 miles SSH), that will be transferred from Federal management to private landowners. In exchange, the BLM would acquire from private entities 55.8 miles of perennial streams that are occupied steelhead habitat (43.3 miles SSH).

BLM finds upon completion of this Biological Assessment that disposal of 124 May Affect tracts (24,850 acres of the total 51,700 disposal acres) within the range of the John Day and Umatilla River basins may effect bull trout and it's habitat, but the action is "Not Likely to Adversely Affect" the species.

BLM also finds that acquisition of approximately 47,000 acres within the Mid Columbia steelhead trout ESU in the John Day basin may effect steelhead trout and it's habitat. Acquiring 43.3 miles of steelhead trout spawning and rearing habitat in the North Fork and Upper John Day River subbasins and an additional 12.3 miles of steelhead winter rearing habitat in the N.F. John Day River within blocked land parcels, is expected to benefit the species over the long term with the application of a wide array of restoration management practices. Acquisition lands are largely blocked, fairly contiguous, and border over 20 miles of National Forest.

Acquisition of 12.3 miles of migrating bull trout habitat on the North Fork John Day, and over 47,000 acres of uplands, and over 50 miles of tributary streams that drain into the North Fork will benefit bull trout and their habitat when management strategies are implemented that facilitate riparian improvement. PAC-FISH riparian habitat conservation area buffer guidelines would be applied to all acquisition lands. Federal riparian buffers afford greater protection to streams than State Forestry Practices Act standards. Implementing conservative levels of livestock grazing (significantly less than is occurring now as private land) and designing rotation grazing systems that sustain native vegetation on riparian and upland habitats will allow riparian and upland vegetation to improve and re-establish in areas that have been damaged.

As these lands are connected and adjacent to National Forest lands, opportunities to effectively manage lands and resources on a watershed scale can be realized. Headwater lands and streams on National Forest lands (North Fork drainage) contain the largest concentrations of bull trout and suitable habitat in the basin.

The BLM requests concurrence from the National Marine Fisheries Service on this Biological Assessment of the proposed land exchange of these "May Affect" disposal acres 124 tracts (24,850 acres) of disposal lands and over 47,000 acres of acquisition lands.

References Cited

Anderson, J. J. (in press). Decadal Climate Cycles and Declining Columbia River Salmon. Proceedings of the Sustainable Fisheries Conference. Victoria, B.C. 1996. Eric Knudson, Editor. Special Publication of the American Fisheries Society.

Bjornn, T. C., and D. W. Reiser. 1991. Habitat Requirements of Salmonids in Streams. *In:* Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication. 19: 83-138. 1991.

Bureau of Land Management. 1985. Two Rivers Resource Management Plan. Prineville, Oregon.

Chamberlain, T.W., R.D. Harr, and F.H. Everest. 1991. Timber Harvesting, Silviculture, and Watershed Processes. *In* influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication, pp 181-205.

Chilcote, M.W. 1998. Conservation Status of Steelhead in Oregon. Oregon Department of Fish and Wildlife. Information Report #98-3. Portland , OR.

Furniss, M. J., T. D. Roelofs, and C. S. Yee. 1991. Road construction and maintenance. *In:* Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication. 19: 297-323. 1991.

Kostow, K. 1995. Biennial Report on the Status of Wild Fish in Oregon. Oregon Department of Fish and Wildlife. Portland, OR.

Oregon Department of Fish and Wildlife. 1990. John Day River Subbasin Salmon and Steelhead Production Plan. Portland, OR.

Oregon Department of Fish and Wildlife. 1990. Umatilla River Subbasin Salmon and Steelhead Production Plan. Portland, OR.

Oregon Department of Water Resources. 1986. John Day Basin Report.

Platts, WS 1991. Livestock Grazing. *In* influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication, pp 181-205.

Schreck, C.B., K.W. Li, R.D. Hort., and CS. Sharpe. 1986. Stock identification of Columbia River chinook salmon and steelhead trout. Division of Fish and Wildlife, Bonneville Power Administration, Project 83-451, Final Report, Portland , OR.

Taylor, G.H., and C. Southards. 1997. Long Term Climate Trends and Salmon Populations. Oregon Climate Service Report.

Unterwegner, T., ODFW John Day District Fish Biologist. 1999. Personal Communication.

Table 1. Potential Disposal Lands Containing Commercial Timber					
Parcel#, Sub-basin	**Legal Description**	**Parcel Size/ Acres of Commercial Timber**	**Non Fish-Bearing Stream Channel Miles**	**Miles to (or miles of) Fish Habitat from (or in) Parcel**	
				Bull Trout	Steelhead or Redband
Umatilla Basin - Morrow County					
T 4 S., R. 28 E.					
M12	Sec. 1	120/70			>5 to AH
M11	Sec. 15	40/37			1.2 to AH
T. 4 S., R. 29 E.					
M15	Sec. 3	40/34		>5 to HBH	2.1 to AH
M13	Sec. 6	80/12			>5 to AH
T. 5 S., R. 26 E.					
M-8	Sec. 11	40/20	0.3-P		4.8 to AH
T. 5 S., R. 27 E.					
M10	Sec. 3	40/10			1.6 to AH
M-9	Sec. 17	40/40			0.7 to AH
Umatilla Basin - Umatilla County					
T. 2 S., R. 35 E.					
UM62	Sec. 25	40/37	0.3-NP	4.4 to HBH	0.8 to AH
T. 3 S., R. 32 E.					
UM48	Sec. 2	80/74		>5 to HBH	0.9 to AH
T. 4 S., R. 30 E.					
UM13	Sec. 1	20/13		>5 to HBH	0.4 to AH
UM11	Sec. 2	20/14	0.1-NP	>5 to HBH	0.8 to AH
UM9	Sec. 10	40/30		>5 to HBH	0.1 to AH
UM10	Sec. 10	40/25	0.05-P	>5 to HBH	0.05 AH
Summary					

MBH - Migratory Bull Trout Habitat
BSH - Bull Trout Spawning, Rearing, or Resident Adult Habitat
AH - Anadromous/Resident Habitat (steelhead/redband trout)
P - Perennial Stream (Non Fish-Bearing)
HBH - Historic Bull Trout Habitat
RH - Resident Fish Habitat
NP - Non Perennial Stream

Umatilla Basin	CFL's	4=	4-
Morrow County	223	69	82
Umatilla County	193	37	0
Totals	416	106	82

MBH - Migratory Bull Trout Habitat
BSH - Bull Trout Spawning, Rearing, or Resident Adult Habitat
AH - Anadromous/Resident Habitat (steelhead/redband trout)
P - Perennial Stream (Non Fish-Bearing)
HBH - Historic Bull Trout Habitat
RH - Resident Fish Habitat
NP - Non Perennial Stream

Legal Descriptions Pertaining to the NOALE/TRIANGLE Land Exchange Map dated November 5, 1999 (Revised 8/4/00) *Public Lands to be Disposed of by the USDI, BLM*		
On this table, the parcels are listed by county (Wheeler-W, Grant-G, Morrow-M, and Umatilla-UM) and legal description in ascending order, to the extent possible. The order is from lower numbered townships/ranges/sections to larger numbered. A summary listing total potential disposal acres by county is presented at the end of the table.		
Parcel	**Legal Description** (All Willamette Meridian, Oregon)	**Approx. Acres**
Wheeler County		
T. 6 S., R. 23 E.		
W1	Sec. 23, NE¼SW¼	
T. 7. S, R. 22 E.		
W2 & W3	Sec. 12, Lot 3, NW¼NE¼	
W4	Sec. 14, NW¼SE¼	
W5	Sec. 20, SW¼NE¼	
W6	Sec. 23, NW¼SW¼	
W7 & W8	Sec. 25, NE¼NE¼, S½NW¼	
W8 & W9	Sec. 26, S½NE¼, SE¼SE¼	
W10	Sec. 34, NE¼SW¼	
T. 8 S., R. 21 E.		
W24A	Sec. 05, Lot 1	
W24B	Sec. 14, Lot 5	
T. 8 S., R. 22 E.		
W11 & W15	Sec. 1, Lots 1,3 & 5 (37.97, 38.91 and 34.60 acres, respectively)	
W16	Sec. 4, SE¼NW¼	
W17	Sec. 6, SE¼SW¼	
W17	Sec. 7, Lot 6, NE¼NW¼	
W12	Sec. 10, Lot 4	
W13	Sec. 11 SE¼SW¼	
W19	Sec. 24, Lots 3 and 4 (30.43 and 30.89 acres, respectively), and W½E½	
W19	Sec. 25, Lots 1-4 (31.36, 31.83, 32.3, and 32.77 acres, respectively) and W½NE¼, NW¼SE¼	
W21 & W22	Sec. 26, Lots 1 and 2 (35.19 and 35.09 acres, respectively) and NW¼SE¼, S½SE¼	
W23	Sec. 34, NE¼SE¼	
W21	Sec. 35, N½NE¼	
T. 8 S., R. 23 E.		
W14	Sec. 9, S½SW¼	
W18	Sec. 19, E½SW¼, SW¼SE¼	120
W20	Sec. 30, Lots 2 and 3 (38.82 and 38.94 acres, respectively), SE¼SW¼	
T. 8 S., R. 24 E.		
W34	Sec. 10, NW¼SW¼	
W35	Sec. 17, SW¼SW¼	
W36	Sec. 21, NW¼SE¼, SE¼SE¼	
W37	Sec. 23, E½SW¼, W½SE¼, NE¼SE¼	
W38	Sec. 25, SW¼NE¼	
W36 and W39A	Sec. 27, NW¼NW¼, SW¼SE¼	

MBH - Migratory Bull Trout Habitat
BSH - Bull Trout Spawning, Rearing, or Resident Adult Habitat
AH - Anadromous/Resident Habitat (steelhead/redband trout)
P - Perennial Stream (Non Fish-Bearing)
HBH - Historic Bull Trout Habitat
RH - Resident Fish Habitat
NP - Non Perennial Stream

W36	Sec. 28, NE¼NE¼	
	T. 8 S., R. 25 E.	
W42	Sec. 7, NE¼SW¼	4
Grant County		
	T. 7 S., R. 27 E.	
G7	Sec. 34, SW¼SE¼	4
	T. 7 S., R. 29 E.	
G7	Sec. 14, S½NW¼	8
G7	Sec. 15, SE¼NE¼	4
G6	Sec. 17, NW¼SE¼	4
	T. 7 S., R. 30 E.	
G4	Sec. 15 NW¼NE¼	4
G2 and G3	Sec. 23, SE¼SW¼, NE¼SE¼	8
G1	Sec. 24, NE¼NE¼	
	T. 8 S., R. 27 E.	
G8	Sec. 14, N½NW¼	
G8 and G9	Sec. 15, N½NE¼, W½SW¼	
G10	Sec. 25, NW¼SE¼	
G701	Sec. 29, N½SW¼	
G76ABE	Sec. 32, W½SW¼	
G72	Sec. 35, SE¼SW¼	
T. 8 S., R. 28 E.		
G24A	Sec. 11, S½NE¼, E½SW¼, SE¼	320
G24B	Sec. 12, S½NE¼, S½NW¼, N½SW¼, SW¼SW¼	280
G20, G21, and G24C	Sec. 14, NW¼NE¼, NE¼NW¼, NW¼SW¼, NW¼SE¼	160
G17	Sec. 15, E½SW¼	80
G16, G18 and G22	Sec. 22, NE¼NE¼, SW¼NW¼, NE¼SE¼	120
G22 and G19	Sec. 23, N½NW¼, SE¼NW¼, SW¼SW¼	160
G23	Sec. 24, W½NE¼, NW¼SE¼	120
G15	Sec. 26, SW¼SE¼	40
G14	Sec. 27, SW¼SE¼	40
G11	Sec. 31, Lots 9 and 10 (25.06 and 24.85 acres, respectively)	
	T. 8 S., R. 29 E.	
G27B	Sec. 5, SW¼NW¼	
G25AB	Sec. 7, Lots 7,8,9,16,17,18,19,21 and 22 (48.65, 40, 40, 40, 40, 48.62, 48.58, 40, and 40 acres, respectively).	
G294	Sec. 9, SW¼NW¼	
G26	Sec. 18, Lot 15	
G28	Sec. 22, SW¼SE¼	
G28	Sec. 27, NE¼, E½NW¼, NW¼SE¼	
	T. 8 S., R. 30 E.	
G32	Sec. 12, SE¼NW¼	
G33	Sec. 14, NE¼NE¼	
G30	Sec. 20, SW¼NW¼	
G34	Sec. 24, S½SW¼	
	T. 8 S., R. 31 E.	
G295	Sec 23, NE¼NW¼	
G35	Sec. 30, Lot 1	
G36 and G37	Sec. 32, NE¼NW¼, NW¼SW¼	
	T. 9 S., R. 26 E.	
G76ABCE	Sec. 1, Lots 1 and 2 (29.52 and 29.57 acres, respectively), S½NE¼, NE¼SE¼	
G84A	Sec. 3, Lots 3 and 4 (26.57 and 26.2 acres, respectively), and SW¼NE¼, S½NW¼	
G84D	Sec. 4, S½SW¼	

G84B	Sec. 10, E½, E½SW¼	
G84C	Sec. 11, SW¼NE¼, SW¼	
G84CE, G81, and G82	Sec. 14, N½NW¼, NW¼SW¼, NE¼SE¼	
G84B	Sec. 15, NE¼NE¼	
G83A	Sec. 22, SW¼SW¼	
G83B	Sec. 27, SE¼SE¼	
		T. 9 S., R. 27 E.
G71	Sec. 3, Lots 2 and 3 (35.05 and 35.35 acres, respectively)	
G73	Sec. 4, Lot 1	
G74 and G75	Sec. 5, Lot 1 (33.34 acres), and SE¼NE¼, W½SW¼	
G76ABE	Sec. 6, Lots 4,5 and 6 (29.83, 40.37,and 40.62 acres, respectively), and SW¼NE¼, SE¼NW¼, NE¼SW¼, NW¼SE¼	
G69	Sec. 11, W½SE¼	
G69	Sec. 14, NW¼NE¼	
G77AB	Sec. 18, S½NE¼, N½SE¼, SE¼SE¼	
G77BC	Sec. 19, NE¼NE¼, S½NE¼, N½SE¼, SW¼SE¼	
G68B and G67	Sec. 23, E½SW¼, E½SE¼	
G68A	Sec. 24, NW¼NE¼, S½NE¼, NW¼NW¼, S½NW¼, S½	
G68C and G64	Sec. 25, N½NE¼, SW¼NE¼, NE¼NW¼, S½SE¼	
G66 and G68B	Sec. 26, NE¼NE¼, SE¼SW¼, NW¼SE¼	
G79	Sec. 29, S½NE¼, N½SE¼, SW¼SE¼	
G77C and G78	Sec. 30, NW¼NE¼, SE¼NE¼	
G79	Sec. 32, N½NE¼, NE¼NW¼	
G65ABC	Sec. 34, E½E½	
G65ABC	Sec. 35, W½NW¼, SW¼, SW¼ SE¼	
		T. 9 S., R. 28 E.
G55A	Sec. 4, NW¼SE¼	
G56	Sec. 5, Lot 8	
G57	Sec. 6, Lots 1,2,3,6 and 7 (32.26, 31.14, 30.02, 40, and 40 acres, respectively), and SW¼NE¼, NE¼SW¼, NW¼ SE¼	
G58	Sec. 7, W½NE¼, NE¼NW¼	
G59	Sec. 8, SW¼SW¼	
G54	Sec. 9, SE¼SW¼	
G60	Sec. 17, SW¼NE¼, S½NW¼	
G61	Sec. 18, SE¼SE¼	
G62AB	Sec. 20, SW¼ NE¼, SE¼NW¼, N½SW¼	
G53	Sec. 22, N½NE¼, SE¼NE¼	
G52B	Sec. 27, SW¼NE¼, S½NW¼	
G52A	Sec. 28, S½NE¼, SE¼NW¼	
G63AD	Sec. 29, W½, N½SE¼, SW¼SE¼	
G63B	Sec 30, SE¼NE¼, E½SE¼	
G63C	Sec. 31, Lot 1 (38.68 acres), and N½NE¼, SE¼NE¼, NE¼NW¼, NE¼SE¼	
G51	Sec. 34, NW¼NE¼, SE¼NE¼	
		T. 9 S., R. 29 E.
G48	Sec. 21, SE¼NE¼	
G49	Sec. 30, N½SE¼	
G50A and G50B	Sec. 31, Lot 3 (43.39 acres), and SW¼NE¼, E½NW¼	
		T. 9 S., R. 31 E.

G47	Sec. 08, NW¼SE¼	
G46	Sec. 15, SE¼SE¼	
G45	Sec. 23, NE¼NW¼	
	T. 9 S., R. 32 E.	
G38B	Sec. 04, Lot 1	
G38A	Sec. 05, Lot 1 and 2 (40.98 and 41.06 acres, respectively)	
G43A, G43B, and G44	Sec. 18, NE¼NE¼, SW¼NE¼, SE¼SW¼, SW¼SE¼	
G39	Sec. 22, NW¼SW¼	
G41	Sec. 27, SE¼SW¼	
	T. 10 S., R. 27 E.	
G92	Sec. 01, Lot 1, SE¼NE¼	
G85B	Sec. 03, SE¼NE¼	
G85A	Sec. 05, NE¼SW¼, NW¼SE¼	
G86	Sec. 10, W½NW¼, NW¼SW¼, SE¼SW¼	
G91	Sec. 14, NE¼NE¼	
G87	Sec. 15, W½NW¼, NW¼SW¼	
G88	Sec. 22, S½SW¼	
G89	Sec. 26, NW¼SW¼	
G89	Sec. 27, NE¼SE¼	
	T. 10 S., R. 28 E.	
G93	Sec. 07, NE¼SW¼, NW¼SE¼	
G94	Sec. 16, SW¼NE¼, NE¼SW¼, SW¼SW¼, NW¼SE¼	
G95	Sec. 22, SE¼SW¼	
G96, G97, and G98	Sec. 23, NE¼NW¼, NE¼SW¼, SW¼SW¼	
G98 and G99	Sec. 26, NW¼NW¼, SE¼SW¼	
G95	Sec. 27, NW¼NE¼, N½NW¼	
G100	Sec. 33, NW¼SE¼	
	T. 10 S., R. 29 E.	
G103	Sec. 01, SE¼NE¼	
G102	Sec. 13, SW¼NW¼	
G102	Sec. 14, SE¼NE¼	
G101	Sec. 30, Lot 2	
	T. 10 S., R. 30 E.	
G104D	Sec. 21, SW¼NW¼	
G105	Sec. 32, NE¼NW¼	
	T. 10 S., R. 31 E.	
G104C	Sec. 21, NW¼NE¼	
G104B	Sec. 29, W½SW¼	
G104A	Sec. 30, Lot 2	
T. 11 S., R. 29 E.		
G718	Sec. 29, SW¼, SW¼SE¼	
G719/720	Sec. 30, Lot 3 (42.31 acres), NW¼NE¼	
G718	Sec. 32, NW¼NE¼, NE¼NW¼	
T. 12 S., R. 27 E.		
G292	Sec. 06, Lot 10	
G132	Sec. 15, NE¼NE¼	
G133B	Sec. 20, All, except SE¼SE¼	
G134	Sec. 26, W½, W½E½	
G133A	Sec. 28, W½NE¼, W½	
G135	Sec. 34, All	
	T. 12 S., R. 28 E.	
G140/141	Sec. 14, SW¼NW¼, W½SW¼, NE¼SE¼	
G140	Sec. 15, NE¼	
G142	Sec. 24, N½NW¼, SE¼NW¼, NE¼SW¼	

	T. 12 S., R. 29 E.	
G145	Sec. 17, S½N½, NW¼SE¼	
G143/144	Sec. 18, Lots 2 and 3 (40.53 and 40.48 acres, respectively),	
G146	Sec. 20, NW¼NE¼	
G147	Sec. 28, E½NW¼	
G148	Sec. 34, W½SW¼	
	T. 12 S., R. 30 E.	
G150A	Sec. 24, SE¼NE¼, W½, W½E½, NE¼SE¼	
G150AB and 151A	Sec. 25, SE¼NE¼, NW¼NW¼	
G149	Sec. 34, W½W½	
	T. 12 S., R. 31 E.	
G152	Sec. 26, SW¼SE¼	
G151AB and 150B	Sec. 30, Lots 3 and 4 (39.77 and 39.44 acres, respectively), SE¼NE¼, SW¼NW¼, E½SW¼, E½SE¼	
	T. 12 S., R. 32 E.	
G157	Sec. 26, NW¼	
G156	Sec. 28, N½NE¼, SE¼NE¼	
G153 and G154	Sec. 30, Lot 4 (40.3 acres), and SW¼NE¼, SE¼NW¼	
G155	Sec. 32, NW¼SW¼	
	T. 12 S., R. 33 E.	
G158	Sec. 05, Lot 2	
G159	Sec. 15, SW¼NW¼	
G159	Sec. 16, S½NE¼, E½SE¼	
G160	Sec. 17, W½E½	
G161ABC	Sec. 20, SE¼NE¼, SW¼NW¼, SW¼SW¼	
	T. 13 S., R. 27 E.	
G136A	Sec. 02, N½, SE¼	
G136B	Sec. 12, SE¼NE¼, NE¼SE¼	
	T. 13 S., R. 28 E.	
G182	Sec. 14, N½	
G193	Sec. 17, SE¼	
G194	Sec. 18, Lots 3 and 4 (54.78 and 54.93 acres, respectively)	
G193 and G194	Sec. 19, Lot 1 (54.87 acres), and E½NE¼	
G193	Sec. 20, N½NE¼, SW¼NE¼, N½NW¼, SW¼NW¼	
G184	Sec. 22, S½SE¼	
G183	Sec. 24, NE¼SE¼, SW¼SE¼	
G190 and G191	Sec. 29, SW¼SW¼, SW¼SE¼	
G191 and G192	Sec. 30, Lots 3 and 4 (54.62 and 54.97 acres, respectively), SE¼NW¼, NE¼SE¼	
G189	Sec. 31, Lot 4	
G187 and G188	Sec. 32, SE¼NW¼, E½SE¼	
G186	Sec. 33, W½NE¼, SE¼NE¼, E½NW¼	
G185	Sec. 34, NW¼NE¼	
	T. 13 S., R. 29 E.	
G101	Sec. 6, Lots 3,4,5,6 and 7 (40.37, 40.12, 40.36, 40.59, and 40.81 acres, respectively), and SE¼NW¼	
G180	Sec. 8, All	
G177 and G178	Sec. 24, NE¼, W½NW¼	
G179	Sec. 28, W½SW¼	
	T. 13 S., R. 30 E.	
G172	Sec. 04, SE¼SE¼	
G175	Sec. 06, Lots 1-4 (40.12, 40.37, 40.62, and 40.87 acres,	

	respectively)	
G173 and G174	Sec. 14, NW¼NE¼, NE¼NW¼, S½SE¼	
G176	Sec. 18, Lots 1 and 2 (41.34, 41.41 acres respectively), NE¼, E½NW¼, SE¼	
T. 13 S., R. 31 E.		
G169B	Sec. 04, Lots 1 and 2 (40.24 and 40.03 acres, respectively), and S½NE¼, NE¼SW¼, SE¼	
G726	Sec. 22, NW¼NE¼	
G279 and G284A	Sec. 26, Lots 1,2,3,4,7,9,10 (2.5, 2.5, 2.5, 1.25, 1.25, 2.5, and 2.5 acres, respectively), SW¼SW¼, W½SE¼SW¼	
G170	Sec. 28, S½SW¼	
G281 and G284	Sec. 35, W½W½, W½E½W½, E½NW¼SE¼	
G282, G283, and G298	Sec. 36, NE¼NW¼NE¼, S½NW¼NE¼, W½W½NW¼, W½NW¼SW¼, S½NE¼SW¼, SE¼SW¼	
T. 13 S., R. 32 E.		
G167	Sec. 08, SE¼SE¼	
G168A and G168B	Sec. 20, NE¼, N½SW¼	
T. 13 S., R. 33 E.		
G165	Sec. 4, Lots 3 and 4 (40.18 and 40.45 acres, respectively), SW¼NW¼, SW¼	
G166	Sec. 6, Lot 2 (40.56 acres), and SW¼NE¼, W½SE¼	
G164	Sec. 22, NE¼NE¼	
T. 13 S., R. 34 E.		
G163	Sec. 24, SE¼NE¼, SE¼NW¼, N½SE¼	
T. 13 S., R. 35 E.		
G162	Sec. 30, Lot 2 (39.61 acres), SE¼NW¼	
T. 14 S., R. 29 E.		
G197	Sec. 11, E½NE¼, N½S½	
T. 14 S., R. 30 E.		
G200	Sec. 03, NW¼SW¼	
G198	Sec. 07, E½NE¼	
G201	Sec. 11, NW¼SE¼	
		T. 14 S., R 31 E .
G296	Sec. 02, SE¼SE¼	
G203	Sec. 03, Lots 3 and 4 (33.74, 34.12)	
G202	Sec. 05, Lots 3 and 4 (34.69 and 34.56 acres, respectively), NE¼SW¼	
G210BCDE	Sec. 15, NE¼NW¼, NE¼SW¼, S½SW¼, W½SE¼	
G210BCDG	Sec. 21, N½NE¼, NE¼NW¼, NW¼SW¼, SE¼SW¼, SW¼SE¼	
G210BCD	Sec. 22, W½NE¼, SE¼NE¼, N½NW¼, SE¼SW¼, NW¼SE¼	
G212	Sec. 23, NE¼SE¼	
G210A,A1	Sec. 27, E½SE¼	
G209A and G209B	Sec. 28, SE¼NW¼, SE¼	
G206	Sec. 29, SW¼NW¼, NW¼SW¼	
G204	Sec. 30, SW¼SE¼	
G205	Sec. 31, SE¼NW¼, E½SW¼	
G207 and G208	Sec. 32, SW¼NE¼, SE¼NW¼, SW¼SW¼, NW¼SE¼	
G211	Sec. 34, NE¼SE¼	
T. 14 S., R. 32 E.		
G216 and G218	Sec. 01, Lots 1, 3 and 4 (34.13, 33.85, and 33.71 acres, respectively), and NW¼SW¼, NE¼SE¼	
G216	Sec. 02, Lots 1 and 2 (33.55 and 33.37 acres, respectively),	

	and SE¼	
G214	Sec. 04, NW¼SE¼	
G213	Sec. 09, SE¼NW¼, NE¼SW¼	
G215	Sec. 10, NW¼NE¼	
G217	Sec. 12, SW¼NW¼	
T. 14 S., R. 33 E.		
G219	Sec. 07, E½NE¼, NE¼SE¼	
G219	Sec. 08, N½NW¼, SW¼NW¼	
G426	Sec. 09, W½SW¼, NE¼SW¼, NW¼SE¼	
T. 16 S., R. 30 E.		
G728	Sec. 01, Lot 2	
T. 17 S., R. 26 E.		
G272 and G241B	Sec. 13, NE¼NE¼, SE¼NW¼, W½SE¼	
G222	Sec. 17, NW¼NE¼	
G224	Sec. 20, NW¼SW¼	
G223	Sec. 22, SE¼NW¼	
G240AB	Sec. 25, NE¼SE¼, S½SE¼	
G225 and G226	Sec. 29, SE¼NE¼, W½NW¼, N½SE¼	
G225	Sec. 30, SE¼NE¼, NE¼SE¼, S½SE¼	
G225AB and G225	Sec. 31, W½NE¼, NW¼SE¼, SE¼SE¼	
G225AB, G227, and G228	Sec. 32, NW¼NE¼, SW¼SW¼, NW¼SE¼	
G239B	Sec. 35, SE¼	
T. 17 S., R. 27 E.		
G432	Sec. 01, NW¼SW¼	
G432	Sec. 02, S½S½, NE¼SE¼	
G428	Sec. 08, N½NE¼, SW¼NE¼, W½SE¼,	
G429 and G430	Sec. 09, E½SW¼, W½SE¼, SE¼SE¼, N½NE¼, SE¼NE¼	
G286 and G431	Sec. 10, W½NE¼, NE¼NE¼, S½SE¼	
G286	Sec. 11, NW¼NW¼	
G289	Sec. 12, N½SE¼, SW¼SE¼	
G289	Sec. 13, NW¼NE¼	
G431 and G433	Sec. 15, E½NE¼, NW¼NW¼, S½NW¼, SW¼, NE¼SE¼	
G243	Sec. 18, NW¼SW¼	
G246A	Sec. 21, W½E½	
G255	Sec. 26, NE¼SW¼	
G246AB and G247AB	Sec. 27, SW¼	
G246AB and G247AB	Sec. 28, E½, SE¼SW¼	
G244 and G245	Sec. 29, E½NE¼, SW¼SE¼	
G240AB	Sec. 30, Lots 2, 3 and 4 (40.33, 40.36, 40.39)	
G240AB	Sec. 31, Lots 1-4 (40.38, 40.33, 40.28, 40.23)	
G246AB and G247AB	Sec. 33, N½, W½SW¼, SE¼	
G246AB and G247AB	Sec. 34, W½, S½SE¼	
T. 17 S., R. 28 E.		
G274	Sec. 35, E½SE¼	
T. 17 S., R. 29 E.		
G276	Sec. 06, Lot 3	

G275	Sec. 19, SE¼NE¼	
T. 18 S., R. 26 E.		
G238	Sec. 01, S½SE¼	
G239B	Sec. 02, Lots 1 and 2 (40.62, 40.50 acres respectively), S½NE¼, W½SE¼	
G229	Sec. 04, NE¼SW¼	
G225AB	Sec. 05, Lot 4	
G230A and G230B	Sec. 08, NE¼SW¼, SW¼SW¼	
G231	Sec. 09, S½S½	
G231	Sec. 10, S½SW¼	
G237	Sec. 12, SW¼NE¼, S½NW¼, E½SW¼, NW¼SE¼	
G237	Sec. 13, N½NW¼	
G230B	Sec. 17, W½NW¼	
G233	Sec. 19, NE¼SE¼	
G232	Sec. 21, SW¼NE¼	
G236B	Sec. 25, W½NW¼NW¼, E½NE¼NW¼	
G236A	Sec. 26, SE¼NE¼	
G234 and G235	Sec. 28, NW¼NE¼, E½NW¼, S½SE¼	
T. 18 S., R. 27 E.		
G254	Sec. 02, SW¼SW¼	
G246AB and 247AB	Sec. 03, Lots 3 and 4 (43.62, 43.54 acres respectively), S½NW¼, SW¼	
G246AB and 247AB	Sec. 04, Lots 1- 4 (43.40, 43.23, 43.05, 42.88 acres respectively), NE¼SE¼	
G248 and G250AB	Sec. 05, Lots 3 and 4 (42.23, 42.01 acres respectively), S½SE¼	
G249	Sec. 06, SE¼SE¼	
G250AB	Sec. 08, NE¼, N½S½	
G250AB, G246AB and 247AB	Sec. 09, SE¼NE¼, SW¼NW¼	
G246AB, 247AB, G251, and G252	Sec. 10, N½NW¼, SW¼NW¼, SW¼SW¼, NW¼SE¼	
G253	Sec. 11, S½NE¼	
G253	Sec. 12, S½N½	
T. 18 S., R. 28 E.		
G274	Sec. 02, Lot 1	
G257AB and G256	Sec. 05, Lot 1 (57.86), S½N½, NW¼SW¼	
G256 and 257AB	Sec. 06, Lots 1, 2, 3, 4, 5, 6 and 7 (61.24, 62.39, 63.54, 68.30, 41.71, 41.19, 40.66 acres respectively), S½NE¼, SE¼NW¼, NE¼SW¼	
G260	Sec. 07, S½NE¼, N½SE¼	
G260	Sec. 08, NW¼NE¼, S½NE¼, NW¼, N½S½	
G260 and G262	Sec. 09, S½NW¼, NW¼SW¼, E½SE¼	
G262	Sec. 10, W½SW¼, SE¼SW¼	
G269 and G270	Sec. 11, SE¼NE¼, S½SW¼, NE¼SE¼	
G271	Sec. 12, SE¼	
G268	Sec. 14, SW¼SW¼	
G261	Sec. 17, NE¼, NE¼NW¼, S½NW¼, SW¼, N½SE¼, SW¼SE¼	
G265B, G264, and G266	Sec. 21, NE¼NE¼, SE¼SE¼	

G265B and G266	Sec. 22, S½SW¼	
G267 and G268	Sec. 23, NW¼NW¼, SE¼	
G267	Sec. 24, NW¼SW¼, S½SW¼	
G265B and G266	Sec. 27, All	
G265B and G266	Sec. 28, SW¼NE¼, W½SE¼, SE¼SE¼	
G266 and G25B	Sec. 33, E½E½	
T. 18 S., R. 29 E.		
G271	Sec. 07, Lots 3 and 4 (33.82 and 33.67 acres, respectively), E½SW¼	
G272	Sec. 18, NE¼SW¼	
G273	Sec. 19, Lot 3	
Morrow County		
T. 4 S., R. 28 E.		
M12	Sec. 1, SE¼NE¼, N½SE¼	
M11	Sec.15, NE¼NE¼	
	T. 4 S., R. 29 E.	
M15	Sec. 03, NE¼SE¼	
T. 5 S., R. 27 E.		
M10	Sec. 03, NW¼SW¼	
M9	Sec. 17, NE¼SE¼	
	T. 6 S., R. 25 E.	
M5	Sec. 01, Lot 1	24
M2	Sec. 06, Lot 4	23
M1	Sec. 07, NE¼SE¼	40
M1	Sec. 08, NW¼SW¼	40
M4	Sec. 10, E½SW¼, S½SE¼	160
M4	Sec. 15, N½NE¼, NE¼NW¼	120
M6	Sec. 19, Lot 3	39
Umatilla County		
T. 3 S., R. 32 E.		
UM48	Sec. 02, W½SE¼	
T. 4 S., R. 30 E.		
UM13	Sec. 01, Lot 2	
UM11	Sec. 02, Lot 4	
UM9	Sec. 10, SE¼SW¼	
UM10	Sec. 10, NW¼SE¼	
UM7	Sec. 13, N½NW¼	
T. 4 S., R. 31E.		
UM6	Sec. 19, Lot 4 Sec. 30, Lots 1, 2, and 3, SE¼NW¼, E½SW¼	
UM50	Sec. 12, SW¼NE¼	
UM52	Sec. 23, SE¼SE¼	
T. 4 S., R. 32 E.		
UM55	Sec. 18, N½NE¼	
T. 5 S., R. 31 E.		
UM57	Sec. 17, N½SE¼	
UM4	Sec. 18, Lots 2 and 3	
UM70	Sec. 21, SW¼NW¼	
T. 5 S., R. 33 E.		
UM60	Sec. 21, SW¼NW¼	
T. 6 S., R. 33 E.		
UM61A	Sec. 6, Lot 5	

Summary of Potential Disposal Parcels

August 18, 2000 (2:00PM)

Total Acres of Potential Disposal Parcels by County

Grant County	40,120
Wheeler County	2,586
Umatilla County	975
Morrow	726
TOTAL ACRES	44,407

Legal Descriptions Pertaining to the NOALE/TRIANGLE Land Exchange Map dated November 5, 1999 (Revised 8/4/00) *Public Lands to be Disposed of by the USDI, BLM*		
On this table, the parcels are listed by county (Wheeler-W, Grant-G, Morrow-M, and Umatilla-UM) and legal description in ascending order, to the extent possible. The order is from lower numbered townships/ranges/sections to larger numbered.		
Parcel	**Legal Description** (All Willamette Meridian, Oregon)	**Allotment**
Wheeler County		
T. 8 S., R. 21 E.		
W24B	Sec. 14, Lot 5	2532
T. 8 S., R. 22 E.		
W17	Sec. 6, SE¼SW¼	2596
W17	Sec. 7, Lot 6, NE¼NW¼	2596
W19	Sec. 25, Lots 1-4 (31.36, 31.83, 32.3, and 32.77 acres, respectively) and W½NE¼, NW¼SE¼	2605
W21 & W22	Sec. 26, Lots 1 and 2 (35.19 and 35.09 acres, respectively) and NW¼SE¼, S½SE¼	2532
W23	Sec. 34, NE¼SE¼	2532
W21	Sec. 35, N½NE¼	2532
T. 8 S., R. 24 E.		
W37	Sec. 23, E½SW¼, W½SE¼, NE¼SE¼	2532
W38	Sec. 25, SW¼NE¼	2517
Grant County		
T. 7 S., R. 29 E.		
G5	Sec. 14, S½NW¼	4015
G5	Sec. 15, SE¼NE¼	4015
T. 8 S., R. 27 E.		
G8	Sec. 14, N½NW¼	4017
G8 and G9	Sec. 15, N½NE¼, W½SW¼	4017
G10	Sec. 25, NW¼SE¼	4027
G76ABE	Sec. 32, W½SW¼	4101
G72	Sec. 35, SE¼SW¼	4011
T. 8 S., R. 28 E.		
G24A	Sec. 11, S½NE¼, E½SW¼, SE¼	4003
G24B	Sec. 12, S½NE¼, S½NW¼, N½SW¼, SW¼SW¼	4003
G20, G21, and G24C	Sec. 14, NW¼NE¼, NE¼NW¼, NW¼SW¼, NW¼SE¼	4003
G17	Sec. 15, E½SW¼	4003
G16, G18 and G22	Sec. 22, NE¼NE¼, SW¼NW¼, NE¼SE¼	4050
G22 and G19	Sec. 23, N½NW¼, SE¼NW¼, SW¼SW¼	4050
G23	Sec. 24, W½NE¼, NW¼SE¼	4050
G15	Sec. 26, SW¼SE¼	4050
G14	Sec. 27, SW¼SE¼	4050
G11	Sec. 31, Lots 9 and 10 (25.06 and 24.85 acres, respectively)	4027
T. 8 S., R. 29 E.		
G27B	Sec. 5, SW¼NW¼	4046
G25AB	Sec. 7, Lots 7,8,9,16,17,18,19,21 and 22 (48.65, 40, 40, 40, 40, 48.62, 48.58, 40, and 40 acres, respectively).	4003
G294	Sec. 9, SW¼NW¼	4046
G26	Sec. 18, Lot 15	4003

G28	Sec. 22, SW¼SE¼	4136
G28	Sec. 27, NE¼, E½NW¼, NW¼SE¼	4136
	T. 8 S., R. 30 E.	
G32	Sec. 12, SE¼NW¼	4014
G33	Sec. 14, NE¼NE¼	4014
G30	Sec. 20, SW¼NW¼	4135
G34	Sec. 24, S½SW¼	4014
	T. 8 S., R. 31 E.	
G295	Sec 23, NE¼NW¼	4135
	T. 9 S., R. 26 E.	
G76ABCE	Sec. 1, Lots 1 and 2 (29.52 and 29.57 acres, respectively), S½NE¼, NE¼SE¼	4019
G84A	Sec. 3, Lots 3 and 4 (26.57 and 26.2 acres, respectively), and SW¼NE¼, S½NW¼	4069
G84D	Sec. 4, S½SW¼	4036
G84B	Sec. 10, E½, E½SW¼	4037
G84C	Sec. 11, SW¼NE¼, SW¼	4025
G84CE, G81, and G82	Sec. 14, N½NW¼, NW¼SW¼, NE¼SE¼	4030
G84B	Sec. 15, NE¼NE¼	4030
G83A	Sec. 22, SW¼SW¼	4009
G83B	Sec. 27, SE¼SE¼	4009
	T. 9 S., R. 27 E.	
G71	Sec. 3, Lots 2 and 3 (35.05 and 35.35 acres, respectively)	4011
G73	Sec. 4, Lot 1	4011
G74 and G75	Sec. 5, Lot 1 (33.34 acres), and SE¼NE¼, W½SW¼	4101
G76ABE	Sec. 6, Lots 4,5 and 6 (29.83, 40.37,and 40.62 acres, respectively), and SW¼NE¼, SE¼NW¼, NE¼SW¼, NW¼SE¼	4019
G69	Sec. 11, W½SE¼	4082
G69	Sec. 14, NW¼NE¼	4082
G77AB	Sec. 18, S½NE¼, N½SE¼, SE¼SE¼	4185
G77BC	Sec. 19, NE¼NE¼, S½NE¼, N½SE¼, SW¼SE¼	4031
G68B and G67	Sec. 23, E½SW¼, E½SE¼	4111
G68A	Sec. 24, NW¼NE¼, S½NE¼, NW¼NW¼, S½NW¼, S½	4111
G68C and G64	Sec. 25, N½NE¼, SW¼NE¼, NE¼NW¼, S½SE¼	4112
G66 and G68B	Sec. 26, NE¼NE¼, SE¼SW¼, NW¼SE¼	4112
G79	Sec. 29, S½NE¼, N½SE¼, SW¼SE¼	4156
G77C and G78	Sec. 30, NW¼NE¼, SE¼NE¼	4156
G79	Sec. 32, N½NE¼, NE¼NW¼	4156
G65ABC	Sec. 34, E½E½	4085
G65ABC	Sec. 35, W½NW¼, SW¼, SW¼ SE¼	4085
	T. 9 S., R. 28 E.	
G57	Sec. 6, Lots 1,2,3,6 and 7 (32.26, 31.14, 30.02, 40, and 40 acres, respectively), and SW¼NE¼, NE¼SW¼, NW¼ SE¼	4089
G58	Sec. 7, W½NE¼, NE¼NW¼	4089
G59	Sec. 8, SW¼SW¼	4112
G60	Sec. 17, SW¼NE¼, S½NW¼	4123

G61	Sec. 18, SE¼SE¼	4123
G62AB	Sec. 20, SW¼ NE¼, SE¼NW¼, N½SW¼	4112
G52A	Sec. 28, S½NE¼, SE¼NW¼	4167
G63AD	Sec. 29, W½, N½SE¼, SW¼SE¼	4112
G63B	Sec 30, SE¼NE¼, E½SE¼	4112
G63C	Sec. 31, Lot 1 (38.68 acres), and N½NE¼, SE¼NE¼, NE¼NW¼, NE¼SE¼	4112
T. 9 S., R. 29 E.		
G48	Sec. 21, SE¼NE¼	4003
G49	Sec. 30, N½SE¼	4003
G50A and G50B	Sec. 31, Lot 3 (43.39 acres), and SW¼NE¼, E½NW¼	4003
T. 9 S., R. 31 E.		
G45	Sec. 23, NE¼NW¼	4010
T. 9 S., R. 32 E.		
G38B	Sec. 04, Lot 1	4014
G38A	Sec. 05, Lot 1 and 2 (40.98 and 41.06 acres, respectively)	4014
G43A, G43B, and G44	Sec. 18, NE¼NE¼, SW¼NE¼, SE¼SW¼, SW¼SE¼	4014
T. 10 S., R. 27 E.		
G92	Sec. 01, Lot 1, SE¼NE¼	4085
G85B	Sec. 03, SE¼NE¼	4085
G85A	Sec. 05, NE¼SW¼, NW¼SE¼	4151
G86	Sec. 10, W½NW¼, NW¼SW¼, SE¼SW¼	4151
G91	Sec. 14, NE¼NE¼	4151
G87	Sec. 15, W½NW¼, NW¼SW¼	4151
G88	Sec. 22, S½SW¼	4151
G89	Sec. 26, NW¼SW¼	4151
G89	Sec. 27, NE¼SE¼	4151
T. 10 S., R. 28 E.		
G93	Sec. 07, NE¼SW¼, NW¼SE¼	4113
G95	Sec. 22, SE¼SW¼	4113
G96, G97, and G98	Sec. 23, NE¼NW¼, NE¼SW¼, SW¼SW¼	4113
G98 and G99	Sec. 26, NW¼NW¼, SE¼SW¼	4113
G95	Sec. 27, NW¼NE¼, N½NW¼	4113
G100	Sec. 33, NW¼SE¼	4133
T. 10 S., R. 29 E.		
G103	Sec. 01, SE¼NE¼	4033
G102	Sec. 13, SW¼NW¼	4114
G102	Sec. 14, SE¼NE¼	4114
G101	Sec. 30, Lot 2	4133
T. 10 S., R. 30 E.		
G104D	Sec. 21, SW¼NW¼	4114
G105	Sec. 32, NE¼NW¼	4070
T. 10 S., R. 31 E.		
G104C	Sec. 21, NW¼NE¼	4157
G104B	Sec. 29, W½SW¼	4134
G104A	Sec. 30, Lot 2	4134
T. 11 S., R. 29 E.		
G718	Sec. 29, SW¼, SW¼SE¼	4133

G719/720	Sec. 30, Lot 3 (42.31 acres), NW¼NE¼	4175
G718	Sec. 32, NW¼NE¼, NE¼NW¼	4133
T. 12 S., R. 27 E.		
G292	Sec. 06, Lot 10	4120
G132	Sec. 15, NE¼NE¼	4066
G133B	Sec. 20, All, except SE¼SE¼	4060
G134	Sec. 26, W½, W½E½	4061
G133A	Sec. 28, W½NE¼, W½	4060
G135	Sec. 34, All	4066
T. 12 S., R. 28 E.		
G140/141	Sec. 14, SW¼NW¼, W½SW¼, NE¼SE¼	4053
G140	Sec. 15, NE¼	4172
G142	Sec. 24, N½NW¼, SE¼NW¼, NE¼SW¼	4128
T. 12 S., R. 29 E.		
G145	Sec. 17, S½N½, NW¼SE¼	4129
G143/144	Sec. 18, Lots 2 and 3 (40.53 and 40.48 acres, respectively), S½SE¼	4129
G146	Sec. 20, NW¼NE¼	4129
G147	Sec. 28, E½NW¼	4091
G148	Sec. 34, W½SW¼	4005
T. 12 S., R. 30 E.		
G150A	Sec. 24, SE¼NE¼, W½, W½E½, NE¼SE¼	4118
G150AB and 151A	Sec. 25, SE¼NE¼, NW¼NW¼	4118
G149	Sec. 34, W½W½	4006
T. 12 S., R. 32 E.		
G156	Sec. 28, N½NE¼, SE¼NE¼	4173
G155	Sec. 32, NW¼SW¼	4173
T. 12 S., R. 33 E.		
G158	Sec. 05, Lot 2	4016
G159	Sec. 15, SW¼NW¼	4016
G159	Sec. 16, S½NE¼, E½SE¼	4016
G160	Sec. 17, W½E½	4016
T. 13 S., R. 27 E.		
G136A	Sec. 02, N½, SE¼	4061
T. 13 S., R. 28 E.		
G182	Sec. 14, N½	4023
G193	Sec. 17, SE¼	4039
G194	Sec. 18, Lots 3 and 4 (54.78 and 54.93 acres, respectively)	4039
G193 and G194	Sec. 19, Lot 1 (54.87 acres), and E½NE¼	4039
G193	Sec. 20, N½NE¼, SW¼NE¼, N½NW¼, SW¼NW¼	4039
G184	Sec. 22, S½SE¼	4039
G183	Sec. 24, NE¼SE¼, SW¼SE¼	4090
G190 and G191	Sec. 29, SW¼SW¼, SW¼SE¼	4039
G191 and G192	Sec. 30, Lots 3 and 4 (54.62 and 54.97 acres, respectively), SE¼NW¼, NE¼SE¼	4039
G189	Sec. 31, Lot 4	4039
G187 and G188	Sec. 32, SE¼NW¼, E½SE¼	4039
G186	Sec. 33, W½NE¼, SE¼NE¼, E½NW¼	4039
G185	Sec. 34, NW¼NE¼	4039
T. 13 S., R. 29 E.		

G101	Sec. 6, Lots 3,4,5,6 and 7 (40.37, 40.12, 40.36, 40.59, and 40.81 acres, respectively), and SE¼NW¼	4129
G180	Sec. 8, All	4062
G179	Sec. 28, W½SW¼	4095
T. 13 S., R. 30 E.		
G175	Sec. 06, Lots 1-4 (40.12, 40.37, 40.62, and 40.87 acres, respectively)	4006
G173 and G174	Sec. 14, NW¼NE¼, NE¼NW¼, S½SE¼	4055
G176	Sec. 18, Lots 1 and 2 (41.34, 41.41 acres respectively), NE¼, E½NW¼, SE¼	4177
T. 14 S., R. 29 E.		
G197	Sec. 11, E½NE¼, N½S½	4077
T. 14 S., R. 30 E.		
G200	Sec. 03, NW¼SW¼	4059
G198	Sec. 07, E½NE¼	4073
T. 14 S., R. 32 E.		
G216 and G218	Sec. 01, Lots 1, 3 and 4 (34.13, 33.85, and 33.71 acres, respectively), and NW¼SW¼, NE¼SE¼	4045
T. 17 S., R. 26 E.		
G223	Sec. 22, SE¼NW¼	4110
G240AB	Sec. 25, NE¼SE¼, S½SE¼	4110
G225 and G226	Sec. 29, SE¼NE¼, W½NW¼, N½SE¼	4110
G225AB, G227, and G228	Sec. 32, NW¼NE¼, SW¼SW¼, NW¼SE¼	4110
G239B	Sec. 35, SE¼	4105
T. 17 S., R. 27 E.		
G432	Sec. 01, NW¼SW¼	4154
G432	Sec. 02, S½S½, NE¼SE¼	4154
G428	Sec. 08, N½NE¼, SW¼NE¼, W½SE¼,	4186
G429 and G430	Sec. 09, E½SW¼, W½SE¼, SE¼SE¼, N½NE¼, SE¼NE¼	4186
G286 and G431	Sec. 10, W½NE¼, NE¼NE¼, S½SE¼	4154
G286	Sec. 11, NW¼NW¼	4154
G289	Sec. 12, N½SE¼, SW¼SE¼	4154
G289	Sec. 13, NW¼NE¼	4044
G431 and G433	Sec. 15, E½NE¼, NW¼NW¼, S½NW¼, SW¼, NE¼SE¼	4186
G246A	Sec. 21, W½E½	4106
G255	Sec. 26, NE¼SW¼	4067
G246AB and G247AB	Sec. 27, SW¼	4106
G246AB and G247AB	Sec. 28, E½, SE¼SW¼	4106
G244 and G245	Sec. 29, E½NE¼, SW¼SE¼	4186
G240AB	Sec. 30, Lots 2, 3 and 4 (40.33, 40.36, 40.39)	4110
G240AB	Sec. 31, Lots 1-4 (40.38, 40.33, 40.28, 40.23)	4110
G246AB and	Sec. 33, N½, W½SW¼, SE¼	4186

G247AB		
G246AB and G247AB	Sec. 34, W½, S½SE¼	4106
T. 17 S., R. 28 E.		
G274	Sec. 35, E½SE¼	4067
T. 18 S., R. 26 E.		
G238	Sec. 01, S½SE¼	4105
G239B	Sec. 02, Lots 1 and 2 (40.62, 40.50 acres respectively), S½NE¼, W½SE¼	4105
G229	Sec. 04, NE¼SW¼	4110
G225AB	Sec. 05, Lot 4	4110
G230A and G230B	Sec. 08, NE¼SW¼, SW¼SW¼	4110
G231	Sec. 09, S½S½	4110
G231	Sec. 10, S½SW¼	4110
G237	Sec. 12, SW¼NE¼, S½NW¼, E½SW¼, NW¼SE¼	4105
G237	Sec. 13, N½NW¼	4105
T. 18 S., R. 27 E.		
G254	Sec. 02, SW¼SW¼	4067
G246AB and 247AB	Sec. 03, Lots 3 and 4 (43.62, 43.54 acres respectively), S½NW¼, SW¼	4067
G246AB and 247AB	Sec. 04, Lots 1- 4 (43.40, 43.23, 43.05, 42.88 acres respectively), NE¼SE¼	4186
G248 and G250AB	Sec. 05, Lots 3 and 4 (42.23, 42.01 acres respectively), S½SE¼	4186
G249	Sec. 06, SE¼SE¼	4186
G250AB, G246AB and 247AB	Sec. 09, SE¼NE¼, SW¼NW¼	4186
G246AB, 247AB, G251, and G252	Sec. 10, N½NW¼, SW¼NW¼, SW¼SW¼, NW¼SE¼	4067
G253	Sec. 11, S½NE¼	4067
G253	Sec. 12, S½N½	4067
T. 18 S., R. 28 E.		
G274	Sec. 02, Lot 1	4067
G257AB and G256	Sec. 05, Lot 1 (57.86), S½N½, NW¼SW¼	4067
G256 and 257AB	Sec. 06, Lots 1, 2, 3, 4, 5, 6 and 7 (61.24, 62.39, 63.54, 68.30, 41.71, 41.19, 40.66 acres respectively), S½NE¼, SE¼NW¼, NE¼SW¼	4067
G260	Sec. 07, S½NE¼, N½SE¼	4067
G260	Sec. 08, NW¼NE¼, S½NE¼, NW¼, N½S½	4067
G260 and G262	Sec. 09, S½NW¼, NW¼SW¼, E½SE¼	4067
G262	Sec. 10, W½SW¼, SE¼SW¼	4067
G269 and G270	Sec. 11, SE¼NE¼, S½SW¼, NE¼SE¼	4067
G271	Sec. 12, SE¼	4067
G268	Sec. 14, SW¼SW¼	4104
G261	Sec. 17, NE¼, NE¼NW¼, S½NW¼, SW¼, N½SE¼, SW¼SE¼	4155

G265B, G264, and G266	Sec. 21, NE¼NE¼, SE¼SE¼	4155
G265B and G266	Sec. 22, S½SW¼	4067
G267 and G268	Sec. 23, NW¼NW¼, SE¼	4104
G267	Sec. 24, NW¼SW¼, S½SW¼	4104
G265B and G266	Sec. 27, All	4067
G265B and G266	Sec. 28, SW¼NE¼, W½SE¼, SE¼SE¼	4067
G266 and G25B	Sec. 33, E½E½	4067
T. 18 S., R. 29 E.		
G271	Sec. 07, Lots 3 and 4 (33.82 and 33.67 acres, respectively), E½SW¼	4067
G272	Sec. 18, NE¼SW¼	4104
G273	Sec. 19, Lot 3	4104

"ALLOT_NUM"	"ALLOT_NAME"
2,517.00	"BORSCHOWA"
2,532.00	"TOM COLE"
2,596.00	"HOWARD MORTIMORE"
2,605.00	"E. GLENN POTTER"
4,003.00	"SLICKEAR MT."
4,005.00	"WATER SPOUT GULCH"
4,006.00	"DAMON CREEK"
4,009.00	"BIRCH CREEK"
4,010.00	"SLIDE CREEK"
4,011.00	"C G"
4,014.00	"MIDDLE FORK"
4,015.00	"MUD SPRINGS"
4,016.00	"DIXIE"
4,017.00	"BOARD CREEK"
4,019.00	"RAINS CANYON"
4,023.00	"TRIPLE FORK"
4,025.00	"PORTUGUESE"
4,027.00	"TOP ROAD"
4,030.00	"POWERSITE"
4,031.00	"COYOTE FIELD"
4,033.00	"BULLOCK GULCH"
4,036.00	"STONEHILL"
4,037.00	"JUNIPER"
4,039.00	"ALDRICH MT."
4,045.00	"BEAR GULCH"
4,046.00	"THREE MILE"
4,050.00	"JINKS CREEK"
4,053.00	"SARGENT"
4,055.00	"MT. VERNON"
4,059.00	"COLD SPRINGS"
4,060.00	"BAKER CITY"
4,061.00	"SCOTT CREEK"
4,062.00	"WARREN CREEK"
4,066.00	"KIDD CREEK"
4,067.00	"Sheep Creek"
4,069.00	"BIG SPRINGS"
4,070.00	"FOX"
4,073.00	"CAPSUTTLE CREEK"
4,077.00	"MOON MOUNTAIN"
4,082.00	"JACK OF CLUBS"
4,085.00	"BARBER POLE BUTTE"
4,089.00	"EAST MONUMENT"
4,090.00	"MAGPIE CREEK"
4,091.00	"JUNIPER RIDGE"
4,095.00	"FIELDS CREEK"
4,101.00	"LOWER CUPPER"
4,104.00	"SOUTH FORK"
4,105.00	"PYRAMID POINT"
4,106.00	"IZEE"
4,110.00	"FUNNY BUTTE"
4,111.00	"DUSTIN POINT"

4,112.00	"COTTONWOOD FORKS"
4,113.00	"COURTHOUSE ROCK"
4,114.00	"LONG CREEK MTN."
4,118.00	"BEECH CREEK"
4,120.00	"FERRIS CREEK"
4,123.00	"CANYON"
4,128.00	"CUMMINGS CREEK"
4,129.00	"BELSHAW CREEK"
4,133.00	"VAUGHN"
4,134.00	"LOOKOUT"
4,135.00	"GIBSON CREEK"
4,136.00	"BALDWIN GULCH"
4,151.00	"KINZUA"
4,154.00	"MORGAN CREEK"
4,155.00	"BLACKHORSE DRAW"
4,156.00	"RUDIO CREEK"
4,157.00	"KEENY POINT"
4,167.00	"QUARRY"
4,172.00	"CUMMINGS FORK"
4,175.00	"BOULDER"
4,177.00	"CLARK CREEK"
4,185.00	"COCKRAN CREEK"
4,186.00	"BIG FLATS"