# CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above.

## Range Management and Vegetation

A more detailed range report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below. Specific details of allotment management such as pasture movement schedules, range readiness recommendations, utilization limits, range improvement maintenance responsibilities and locations are discussed in the Long Prairie Allotment Management Plan, available at the Barlow Ranger District in Dufur, Oregon.

### Existing Condition

Initial settlement in this portion of the Columbia River Gorge began in the mid-1800s. To facilitate settlement of the West, Congress enacted the Homestead Act of 1862 that authorized the disposition of 160-acre parcels of public domain land to those willing to live on and cultivate it. The promise of future water and irrigation projects encouraged settlement; by 1904 almost 100 million acres of public domain were homesteaded into 500,000 farms.

The history of livestock grazing in this particular area dates back to before the formation of the National Forest system in 1906. Information contained in an Allotment Management Plan from 1965, states, "from 1906 until 1930, the present allotment which was called Mill Creek-District #1, had use in varying degrees by both cattle and sheep. In 1927 the allotment was officially renamed to the Long Prairie Allotment. From 1930 to 1958, the allotment boundary seems to have remained constant, encompassing the general area north of Mill Creek ridge and west of the Hood River County boundary (range line between R10E and R11E). In 1958, sections 13, 23, and 24, T1N, R10E (1,920 acres) were eliminated from the allotment because lands were not suited to grazing and were 60% privately owned. At the same time, sections 4, 5, 6, 7, 8, 9, 17, and 18, T1S, R11E were added as being a natural part of the allotment where use was occurring. Approximately 35% of this added area was privately owned" (1965 Long Prairie Allotment Management Plan). At that time the latest change in the allotment boundary had occurred in 1958, and its total acreage was 12, 364, with 10,157 of this total being Federal land. By 1973 the allotment configuration and size looks like its current situation except for a land exchange in 1993 that transferred two sections of Forest Service land into private ownership (sections 31, 36, T1N, R10E). These two sections removed approximately 950 acres from the overall size, reducing it from 6,650 to 5,700 acres.

At the time of this land exchange (1993) there were two permits issued for 62 cow/calf pairs and 63 cow/calf pairs respectively for a total of 578 Animal Unit Months (AUMs). (A cow/calf pair is defined as a mature cow with a nursing calf, less than six months old. Animal unit months are defined as the amount of forage needed to sustain one cow/calf for one month.) The land exchange required a permit modification to be done to these two permits. The land exchanged

out of National Forest System lands was determined to have a carrying capacity of 20/pair. This reduction was spilt evenly between the two permits (National Forest System lands now- 52/pair & 53/pair). The two permits were then administered with an "on/off provision". This basically means that, permits with on/off provisions are issued when a portion of a logical grazing area contains National Forest System land or other lands under Forest Service administration *and* lands controlled by the permit holder. The intent is to promote efficient use of intermingled ownership. The permit specifies the number, kind, and class of livestock, the specific season, and area of use, for a period of up to 10 years (FSH 2209.13, Ch.10).

This new landowner gave permission to the permittees to continue grazing their livestock on his newly acquired private land, so in order to maintain the efficient use of these lands the permits still indicated 63 and 62 pairs (private-off portion), but they were billed for 52 and 53 pairs (for Forest Service portion).

This private property was then sold in 2003 to a new owner who verbally gave the permittees permission to continue grazing on this land. This landowner logged this area in the summer of 2004, and then has just recently sold this land again in 2005. This most recent owner has indicated they would not like to have grazing on their land. The current condition of the range improvements (fences, and water developments) on this private property are now non-functioning as a result of this harvest activity in 2004, and was a logistical problem for last summer's operation for handling, containing and managing the livestock.

The permitted/authorized numbers for these two permits stayed at 62 & 63 pairs until they were renewed in 2002. At that time the permit holder for the 63/pair permit, retired and waived his permit back to the Forest Service. The other permit was reduced to 52/pair. In summary, one current permit is issued for 52/ pairs or 240 AUMs and one permit for 53/pair is being held by the Forest Service, pending the outcome of this analysis. The actual numbers of livestock on this allotment has varied since the land exchange in 1993. The 63/pair permit holder took "non-use" in 1993, thus there were only 62/ pair on the allotment that year. The following year (1994) the 63/pair permit holder only turned out 32/pair, and the 62/pair holder turned out 52/pair for a total of 84/pair. Then from 1995 until 2004 the 63/pair holder took non-use and the other permittee turned out his 52/pair per year (see Table 3-1).

**Table 3-1. History of Permitted/Authorized Livestock Use (Pairs)**

| Year | # Permitted Livestock | Year | # Permitted Livestock | Year | # Permitted Livestock | Year | # Permitted Livestock |
|---|---|---|---|---|---|---|---|
| **1906** | 160 | **1921** | 25 | **1935** | 219 | **1955/65** | 170 |
| **1907** | 135 | **1922** | 50 | **1936** | 215 | **1966/69** | 70 |
| **1908** | 260 | **1923/ 25** | 40/year | **1937** | 225 | **1970/78** | 95 |
| **1909** | 235 | **1926** | 25 | **1938** | 230 | **1979** | 96 |
| **1910** | 224 | **1927** | 30 | **1939** | 240 | **1980/81** | 105 |
| **1911** | 240 | **1928** | 38 | **1940** | 200 | **1982** | 115 |
| **1912** | 105 | **1929** | 65 | **1941/47** | 190/year | **1983/92** | 125 |
| **1913** | 40 | **1930** | 45 | **1948/49** | 170/year | **1993*** | 62 |
| **1916** | 25 | **1931** | 90 | **1950** | 180 | **1994**** | 84 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1918** | 12 | **1932** | 161 | **1944** | 190 | **1995/04***** | 52 |
| **1919** | 23 | **1933** | 211 | **1951/53** | 181/year | **2005/06** | 0 (non-use) |
| **1920** | 35 | **1934** | 215 | **1954** | 160 | **NA** | NA |
| | | | | | | | |

* 63/pair permittee took "non-use"
** 63/pair permittee turns out 32/pair; 62/pair permittee turns out 52/pair
*** 63/pair permittee takes "non-use"; other permittee turns out 52/pair

The grazing system since 1981 has been a three-pasture, rest-rotation, in part due to the construction of two water developments and approximately four miles of barbwire fence surrounding the private land parcels. Prior to 1981 it was a deferred-rotation system that was implemented in 1963. Records indicate that from 1906 to 1963 the grazing system was a season-long, turn-out, drift, and gather at the end of the season scheme.

The current allotment management plan includes a three-pasture, deferred, rest-rotation grazing system. Under this system, the permittee first turns out his livestock onto the private land (on the north side of the Forest Service boundary), after range readiness (USDA Forest Service, Record of Range Readiness Checks, Form R6-2210-22) has been achieved. The livestock utilize this area for approximately one month, or until utilization levels are reached (35% utilization riparian areas, 50% utilization in uplands as per Forest Plan, FW-293), whichever comes first. The permittee then moves his livestock onto National Forest system land into the first designated pasture for use that season. The animals stay there approximately one month or until utilization levels are achieved (Forest Plan, FW-293). This system accomplishes deferring utilization of forage in the second designated pasture until plant development is allowed to progress to a mature phenological stage. The third pasture is rested (no livestock grazing) for that season, then the following year the rested pasture is utilized and one of the other two is rested. This system requires that each pasture will receive rest one out of three years, and when it is utilized it will be used early in the season one year, and then later in the season for the other year. The use of salt blocks helps to achieve cattle distribution patterns that draw them away from riparian areas. The animals then drift back into riparian areas for water after getting their uptake of salt. The required no salting within a ¼ mile of water requirement is currently identified in the Annual Operating Instructions.

During the 2002, 2003 and 2004 grazing seasons only a two-pasture, deferred-rotation system was in place, utilizing the Surveyor's Ridge pasture early followed by use in the Long Prairie pasture. The Gibson Prairie pasture was rested for these three consecutive years to comply with a Letter of Concurrence from the National Marine Fisheries Service (NMFS) that identified specific terms and conditions under the Endangered Species Act (ESA). This requirement was put in place to reduce potential impacts to winter steelhead habitat.

**Existing Resource Monitoring**

The allotment currently has six short-term monitoring (or implementation monitoring) sites established under the "key area concept". Under this concept these sites are areas upon which signs of excessive plant utilization or soil disturbance first become evident (Forest Service Handbook 2209.21, 523). These areas can reflect adverse environmental conditions or trends much earlier than other areas of the grazing allotment. The purpose of implementation

monitoring sites is to determine compliance with Forest Plan standards and guidelines (FW-293) and to evaluate the short-term results of actions.

Specifically, the short-term monitoring involves reading utilization levels according to the "height-weight concept" (FSH 2209.21, 526). This concept is based on the relationship of weight distribution of the plant with respect to its height. This method was modified in June 2003 to the "stubble-height method" (FSH 2209.21, 528.13). The objective of stubble height measurements is to determine the residual vegetation (key species) height remaining following a period of grazing. A 3-4" residual stubble height was calculated by developing height/weight curves for the identified key species occurring on the allotments to be monitored.

The measurements may be used in two ways: first, to determine when livestock should be moved from the riparian area and/or pasture if needed and second, at the end of the grazing season to determine whether changes to livestock grazing management are needed the following year. It was determined that measuring remaining vegetation is easier than measuring vegetation that was consumed. This method is also easier for livestock permittees to see when looking at "in-season triggers" for moving livestock. This data is collected at every monitoring site at the end of the growing season and then compared to utilization levels identified for that particular ecosystem. In-season, visual estimates are performed for determining pasture moves and avoiding any impending resource damage (FSH 2209.21, 528.11).

The utilization standard from the Forest Plan for the six riparian monitoring sites is no more than 35% (Forest Plan, Table 17 and 18, Four-84). The classification criteria for utilization standards of "unsatisfactory" were given to all of Mt. Hood National Forest's range allotments in 1991. This was a conservative decision based on the fact that there was not enough long-term trend data to indicate that the entire forest's rangelands were in a "satisfactory condition", which would allow up to 45% utilization in riparian areas, and 55% in the uplands (Forest Plan, FW-293). The terms "satisfactory and unsatisfactory" are used with describing "Range Condition". Historically, Range Condition has been defined in two ways: (a) a generic term relating to present status of a unit of range in terms of specific values or potentials. (b) the present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. The Range Condition term is being phased out. Preferred terms are successional status and range similarity index. The short-term monitoring results from past years are listed below. In determining utilization there is a +/- 5% to 6% observer variation error.

**Table 3-2. Utilization Monitoring Data**

| Monitoring Site | West Fork Neal Creek Upper Site | West Fork Neal Creek Lower Site | North Fork Mill Creek | Gibson Prairie | Long Prairie | Middle Prairie |
|---|---|---|---|---|---|---|
| **Year** | **Utilization (% Current Year's Forage Consumed )** | | | | | |
| **1991*** | Not Monitored | Not Monitored | Not Monitored | 65% | 4% | 75% |
| **1992** | 58% | 69% | | <1% (Rested) | 57% | 3% |
| **1993** | Not Monitored | <1% | | 44% | 29% | 22% |
| **1994** | 48% | <1% (Rested) | | <1% (Rested) | 68% | <1% (Rested) |
| **1995** | 47% | 48% | 49% | 41% | <1% | 70% |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1996** | 39% | 57% | <1% (Rested) | 28% | 15% | <1% (Rested) |
| **1997** | <1% Rested** | <1% (Rested) | 36% | 55% | 23% | 46% |
| **1998** | 47% | 37% | <1% (Rested) | <1% (Rested) | 38% | Fenced off (Not accessible) |
| **1999** | 71% | 45% | 38% | 17% | <1% | |
| **2000** | <1% (Rested) | <1% (Rested) | 30% | 13% | 65% | 17-30%***** |
| **2001** | 55% | 35% | 4% | 4% | 65% | |
| **2002** | 35% | <1% | <1% (Rested) | <1% (Rested) | 40% | Fenced off |
| **2003** | 16" *** (Rested) | 2" | 12" (Rested) | 14" (Rested) | 3-4" | |
| **2004** | 3-4" | Not Monitored | 14" (Rested) | 14" (Rested) | 2" | |

*Current monitoring sites were established in either 1991 or 1992.
**In pastures identified for rest, there is always some level of utilization occurring (ie, deer, elk, insects).
***In 2003 Mt. Hood National Forest started to read utilization in terms of "residual stubble height"
****This monitoring site was not accessible to cattle due to fence placement. During reconstruction in 2000/2001 some animals had access to the meadow until completion of the fence in 2002.


**Figure 3-1. Photo of an Implementation Monitoring Site**
(West Fork of Neal Creek/Upper Site–11/4/2004)

The conclusion from the short-term data indicates that riparian sites tend to get utilized heavier than the upland sites. These riparian sites are where water and quality forage is readily available. This is a common concern with rangeland managers. Overall, there is not a forage production

problem; however, there is a problem of distribution, as cattle congregate in a few areas within the allotment.

There were nine long-term monitoring (or effectiveness monitoring) sites established on this allotment in 1962. However over time these sites have become ineffective as they are either no longer included within the allotment or have been damaged. None of these monitoring locations provide consistent, quantitative data for determining range condition, since the protocol for long-term monitoring studies is to have a repeatable, locatable transect on the ground where plant species, plant composition, and soil conditions can be monitored over time. The other consideration is that the term "Range Condition" is being phased out, and the preferred terms are successional status and range similarity index. Sub sequentially, long-term range condition must instead be determined by professional judgment, current monitoring data, photographs, historical knowledge of stocking levels and background on range improvements.

Effectiveness monitoring attempts to answer the question, "Did the practice or activity provide what we wanted?" The answer to this question at this time is somewhat inconclusive, since without certain fundamental data and a direction of trend in interpreting this data, other information will be needed. The data that is available for interpretation does lead to some conclusions on what the current condition of the vegetation composition is, and more importantly identifies what type of long term-monitoring needs to be established to determine a desired future condition (DFC) for what is realistic given the current vegetative conditions.

**Vegetation Suitability/Capability & Production**

The majority of permanent range occurs in the meadows and riparian areas of this allotment. In the timbered portions of this allotment the transitory range provides forage on a relatively short-term basis (20 to 50 years). This is forage produced in openings created by timber harvest activities. These areas were seeded with a grass species mix of orchard grass (*dactylis glomerata*), Timothy grass (*phleum pratense*), intermediate wheatgrass (*Agropryon intermedium*) and brome grass (*bromus spp.*). This forage production is significant for the first 8-20 years following harvest, but drops off as the tree canopy shades out the herbaceous vegetation. There are some harvested areas within the transitory range that have almost permanently become grasslands due to the difficulty of reseeding trees in the area, and these areas have remained as forage areas for cattle.

In 1963, the district ranger and permittees met to develop an allotment management plan addressing resource damage occurring within this allotment. The concern was overgrazing in the riparian areas due to excessive numbers of livestock. A major reduction in livestock numbers was implemented along with a shortened grazing season and more range improvements (such as watering troughs). Of the new improvements proposed was a plan to re-vegetate/reseed all the major meadows to improve forage capacity. Nine meadow complexes were reseeded with a non-native mixture of Timothy grass, ryegrass, orchard grass and intermediate wheatgrass. These species still dominate these areas.

A forage production study was performed on this allotment to determine the weight of desirable, air-dry, herbaceous forage utilized by livestock (pounds per acre) within primary, secondary and transitory range. The protocol for gathering this data was the "clipping procedure" method (FSH

2209.21, 527.1). This is a common procedure that clips and weighs forage from small sample plots to estimate annual forage production. This was done for three straight years (2002, 2003, & 2004) in order to minimize normal weather fluctuations. From this data, an appropriate carrying capacity can be estimated. Carrying capacity is defined as the maximum level of forage utilization possible without inducing damage to vegetation or related resources. It may vary from year to year on the same allotment due to fluctuating forage production (FSH, 2209.21, 50, 14). The results from this study are listed in Table 3-3.

Forage production is expected to stay the same in the relative short term (0-30 years). This would eventually be expected to drop off in the long term (> 30 years) since the transitory range (disturbed habitat) is expected to return to a forested canopy. Those trees would eventually shade out the grasses, especially the non-native species which cannot compete. If no new transitory range is created through timber harvest or fire in the future this trend would continue. The most productive areas for forage (Gibson Prairie, Long Prairie, and North Fork of Mill Creek) are expected to stay productive at the current level of use, since these are more productive than the transitory range units.

Included in the forage production study is an estimate for wildlife forage needs. Twenty-five percent was subtracted from the total production available to ensure adequate forage for wildlife.

**Table 3-3. Forage Production Study**

| **Primary Range (Riparian Areas)** | **Total AUMs Available** | **Acres** | **Allowable Use** |
|---|---|---|---|
| Long Prairie | 12 | 15 | 35% |
| North Fork Mill Creek | 13 | 13 | 35% |
| Gibson Prairie | 10 | 21 | 35% |
| Upper Neal Creek | 1 | 2 | 35% |
| **Total Riparian** | **36** | **51** | **35%** |
| | | | |
| **Transitory/Secondary Range** | | | |
| Timber Sales 1950-1960 (Harvest Clear Cut) | 53 | 63 | 50% |
| Timber Sales 1960-1970 (Clear Cut & Partial Cuts) | 763 | 642 | 50% |
| Timber Sales 1970-1980 (Clear Cut, Shelterwood Harvest, Individual Tree Mark Harvest, and Thinning) | 643 | 856 | 50% |
| Timber Sales 1980-1992 (Clear Cut, Shelterwood Harvest, Harvest Final Removal) | 846 | 1,110 | 50% |
| **Total Transitory/Secondary** | **2,305** | **2,671** | **50%** |
| **TOTALS** | **2,341** | **2,722** | |
| **Less 25% for wildlife** | **585** | | |
| **TOTAL AUMs AVAILABLE** | **1,756** | | |

**Range Improvements**
Range improvements, including water developments and fences, are an integral part of maintaining livestock control and distribution in the analysis area. Distribution is beneficial as it spreads the grazing use from concentrated points, reducing impacts to riparian areas, and increasing forage availability for livestock weight gain. Upland water developments, riding, and salting practices can help disperse livestock to areas where ample forage exists.

Range improvements within the allotment are a combination of drift and boundary fences, stock watering ponds, spring developments, water guzzlers, corrals and cattleguards. See Table 3-4 for a detailed list of existing improvements. The majority and type of the older fencing already in place is a 4-strand barbed wire type. The fences that have been constructed within the last 15 years have been constructed as a "wildlife fence" design. This design calls for the top barbed wire to be 42" high, which most deer can easily jump. The next barbed wire is 8" below this, with the next barbed 8" below this, with the bottom wire smooth, at 16" off the ground. The smooth wire allows for the younger wildlife to pass under the fence. The advantages of this conventional barbed/smooth wire fence are that the skills and designs for construction are readily available. The disadvantages are labor and material costs (total is approximately $6,000-$8,000/mile: $4-$5K for labor and $2-$3K for materials). The maintenance rating is "medium".

The life expectancy for pressure treated wood used in this construction is around 35 years. The life expectancy for the barbed/smooth wire used is around 30 years. The years till rust appears is around 11 on this type of wire, with 50+ years after rust appears until the wire reaches its half strength ("Fences", Missoula Technology & Development Center, July, 1988).

The effectiveness of these projects is directly related to the degree of maintenance they receive after they are constructed. If they are maintained to specifications, which responsibility becomes the permittees after construction, then 30-35 years can be expected as life expectancy before re-construction would need to occur.

The effectiveness of water developments are discussed in the hydrology section on page 66.

**Table 3-4. Existing Range Improvements**

| Map Attribute # | Improvement Name | Condition | Location |
|---|---|---|---|
| **Alternative Water Sources** | | | |
| R06-101 | MJB Spring | Fair | T1S R10E SEC 1 NESW |
| R06-102 | Hidden Spring | Fair | T1S R10E SEC 2 SESE |
| R06-103 | Gibson Spring | Good | T1S R10E SEC 14 SWNW |
| R06-104 | Hillside Spring | Good | T1S R10E SEC 14 SENW |
| R06-106 | John's Spring | Good | T1S R11E SEC 7 NWSE |
| R06-107 | North Guzzler | Poor- scheduled for reconstruction/maintenance; should be completed before cattle are turned-out onto the allotment (see page 20). | T1S R10E SEC 2 NWSW |
| R06-110 | Joe's Spring | Fair | T1S R10E SEC 2 NWSE |
| R06-111 | McClure's Spring | Good | T1S R10E SEC 1 SESE |

| | | | |
|---|---|---|---|
| R06-129 | Doyle Spring | Good | T1S R10E SEC 11 SWSE |
| **Fences** | | | |
| R06-109 | Long Prairie Pasture/Surveyor's Ridge Pasture Division Fence | Fair –scheduled for reconstruction/maintenance; should be completed before cattle are turned-out onto the allotment (see page 20). | T1N R10E SEC 36<br>T1S R10E SEC 2 |
| R06-112<br>R06-115 | Eastside Allotment Boundary Fence (North and South) | Poor –would be reconstructed as part of annual allotment maintenance (see page 20). | T1N R11E SEC 31<br>T1S R10E SEC 1<br>T1S R11E SEC 7 |
| R06-113 | Long Prairie Meadow Fence | Fair –reconstructed in September 2005 as part of a separate NEPA decision (see page 20). | T1S R10E SEC 2 NWSE |
| R06-114 | Gibson Prairie/Long Prairie Pasture Division Fence | Fair/Poor –scheduled for reconstruction/maintenance before the cattle are turned back out onto the allotment (see page 20). | T1S R10E SEC 1,2,12 |
| R06-116 | Rimrock Fence NW Boundary of Surveyor's Ridge | Poor- not needed and will not be maintained. | T1N R10E SEC 35 & 36<br>T1S R10E SEC 3 & 4 |
| R06-118 | Gibson Horse Camp Fence | Good | T1S R10E SEC 14 SWNW |
| R06-130 | Oak Ridge Fence - Drift Fence | Poor –not needed and will not be maintained. | T1S R10E SEC 3 N1/2 |
| R06-137 | The Dalles Watershed Fence | Poor- The Forest Service is not maintaining. Left in place by a decision of The Dalles Municipal Watershed. | T1S R10E SEC 13,14,23<br>T1S R11E SEC 8,17,18 |
| R06-139 | Long Prairie Corrals | Fair – will not be maintained; to be removed as part of a separate NEPA analysis | T1S R10E SEC 2 SWSE |
| R06-144 | Middle Prairie Fence Enclosure (Replaced R06-138) | Good | T1S R10E SEC 12 SWNW |
| | | | |

## Environmental Effects

### Alternative 1 – No Grazing

### Direct and Indirect Effects

The anticipated results from eliminating commercial livestock grazing would be expected to affect the economic well being of the permittee (discussed further under the Economic Efficiency section). There would also be a one-time cost to the Forest Service to remove the range improvements identified as not needed. Eliminating grazing and the existing range improvements would eliminate the need for long-term maintenance and the associated costs, as well as reduce the amount of permit administration necessary on the Mt. Hood National Forest.

Implementing the no grazing alternative is anticipated to accelerate the upward direction of the apparent trend in range condition for the riparian areas identified in this document. An apparent trend in range terminology is "an interpretation of trend based on observation and professional judgment at a single point in time." The rate of acceleration in upward trend is difficult to predict. This assumption of recovery is based on the ongoing grazing that would be occurring in these areas from wildlife (elk and deer). There would still be some herbivory use by big game species (see Wildlife section). The expected result would be less grazing and browsing on the existing vegetation. Many ecologists and plant physiologists agree that grazing even in a small amount can alter plant communities (Caldwell 1984, Pieper 1984).

Mechanical impacts (hoof action) associated with livestock would also be eliminated with this alternative. There would be less soil erosion and plant defoliation by domestic herbivores in the riparian areas, but how that determines upward trend in range condition in this allotment is more dependent on species composition than it is on intensity, season, duration, frequency of use, level of selectivity and site characteristics.

In the short term, there would be a slight increase in total forage production due to a lack of utilization by livestock, but in the long term, the production of the non-native species would level-off and eventually start to decline as the build up of plant litter and biomass accumulates and the start to choke out the flow of nutrients to the plants.

Due in large part due to re-vegetation projects in the 1960s, it is not anticipated that native, herbaceous vegetation would return to historic levels without vegetation manipulation. The current, herbaceous species mix is quite established in the riparian areas, and it is possible that the removal of livestock may not be sufficient by itself to return native species to the area.

Relaxation of grazing pressure tends to reverse the process toward excellent range condition and climax vegetation (Pieper, 1994). As Anderson (1977) has stated, "Merely lessen the grazing intensity, shorten or change the season, and measurable improvement is apparent". The implication is that removal of livestock from rangelands will return them to pristine conditions. If resources have deteriorated, the reduction in stocking will often provide some improvement such as greater plant density, cover and productivity, and less soil erosion. Changing season of use or some other modification of grazing practice can result in dramatic improvements in riparian vegetation, as well as upland vegetation (Elmore et al. 1994). However, because of other changes that have occurred (such as the introduction of non-native species and lack of fire) restoring the area to its original state cannot necessarily occur simply by removing livestock. Livestock constitute only one component of rangeland ecosystems, and many extrinsic factors, especially weather variations are instrumental in altering ecosystem components (Pieper, 1994).

The indirect effect of eliminating commercial livestock grazing on this allotment could have an impact on the private land surrounding this allotment. The drift of livestock off this allotment that has historically occurred to the north on Forest Road 17 and Forest Road 1710 (Fir Mountain road), into The Dalles Watershed area (Barlow Ranger District) on the southern boundary, and to the west of the allotment boundary downhill from Surveyor's Ridge to private land would not occur.

**Cumulative Effects**
The cumulative effects of canceling livestock grazing on this allotment in relation to the Mt. Hood National Forest's overall grazing program would be a reduction of 5% in both AUMs, and headmonths. The reduction in the overall acres available for livestock grazing on the Mt. Hood National Forest would be a reduction of 3%.

**Alternative 2 – Current Management with Slight Modifications**
**Direct and Indirect Effects**
The apparent range trend toward climax or potential natural community is anticipated to remain static from implementing Alternative 2 without important long-term trend data to confirm this. Without implementing major vegetation conversion projects in the riparian areas to convert the non-native grasses to native species, vegetation is expected to stay in its current condition.

There would be continued utilization of up to 35% (3-4" stubble height) of forage each season in the identified riparian areas (Gibson Prairie, North Fork Mill Creek and West Fork of Neal Creek). The "near natural rate of recovery" (any effect that carries over to the next year is likely to result in cumulative negative effects, and measurably slow recovery of degraded riparian features) would be expected to have starts and stops, due to seasonal fluctuations in climate, permittee non-compliance, and logistical problems outside the control of the permittee. An apparent upward trend moving towards the desired future condition across the allotment in the long term would continue and could be determined by photo points, utilization monitoring, and long-term monitoring; however, there would still be areas of concern where cattle tend to concentrate (see Figure 1-2).

Concentrated use in the identified areas of concern would require more permit administration by the Forest Service and management by the permittee (riding, movement, rest, salting, and fencing) to spread out distribution of livestock to ensure compliance with meeting Forest Plan Standards and Guidelines (FW-293).

The three pasture, rest-rotation grazing system strategy would continue. This grazing strategy has shown some of the generalized responses of riparian ecosystems to livestock grazing as discussed by Elmore (1992), and Platts and Nelson (1989). The ratings by these authors are based on observations in different riparian/stream systems, and therefore should be viewed with caution (see Table 3-5). However, they do contain similarities for assessing management potential for success in the Pacific Northwest. The review recognized that the rates of recovery and resultant vegetation composition for each riparian/stream system are dependent on many factors including site potential, current ecological condition, stream geomorphology, and climate (Elmore, Kauffman, 1994).

Table 3-5 shows the evaluation and rating of grazing strategies based on the above mentioned author's personal observations, as related to stream-riparian habitats. Rating scale based on 1 (poor) to 10 (highly compatible with fishery needs).

| Table 3-5. Evaluation and Rating of Grazing Strategies | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Strategy** | **Level to which riparian vegetation is commonly used** | **Control of animal distribution** | **Streambank stability** | **Brushy species Cond.** | **Seasonal plant regrowth** | **Stream/rip. rehab. potential** | **Rating** |
| Deferred-rotation | Heavy to moderate | Good | Fair | Fair | Fair | Fair | 4 |
| Rest-rotation | Heavy to moderate | Good | Fair to good | Fair | Fair to good | Fair | 5 |
| Riparian pasture | As prescribed | Good | Good | Good | Good | Good | 8 |
| Corridor fencing | None | Excellent | Good to excellent | Excellent | Good to excellent | Excellent | 9 |
| Rest/closure | None | Excellent | Excellent | Excellent | Excellent | Excellent | 10 |

"*Ecological Implications of Livestock Herbivory in the West*"- M.Varva,W.Laycock, and R.Pieper. SRM, 1994.

The three-pasture, rest-rotation grazing system typically provides for total annual rest for each pasture on a regular basis, or each pasture rested one grazing season, every three years. This strategy is designed for upland vegetation improvement (seed production, vigor, seedling establishment, root production and litter accumulation). This system can be very successful on low gradient sedge (*carex),* rush *(juncus)* and grass dominated riparian sites (Elmore, Kauffman, 1994). The uplands in the Long Prairie Allotment are healthy and responding well to browsing and grazing under this grazing scheme. Livestock would be managed so that utilization in the uplands would continue with 50% use of the current year's forage, as per the Forest Plan (FW-293).

The pasture fences are in need of maintenance and/or reconstruction and have had some ineffective areas. Cattle have been able to breech portions of fences, making management more difficult. Important pasture fences would need reconstruction before cattle are turned back out in order to maintain pasture divisions. The fences over fifteen years old would need to be converted to a "wildlife" design specification to be user friendly for wildlife. The fences approaching 30 years old would need to be re-constructed due to out living their effectiveness.

Without a fence on the north boundary, livestock would potentially continue the impacts on the private land to the north of this allotment. These impacts would be concentrated use in the riparian areas and potential tree seedling damage in the recently-harvested and planted areas. This drift has historically occurred to the north of the allotment on Forest Service roads 17 and 1710 (Fir Mountain road). There has been some occasional drift into The Dalles Watershed on the southern boundary, but a fence that was constructed in 1993 curtailed this. However, this fence is in a poor condition and needs maintenance to bring it up to current specifications. Some drift to the west of the allotment boundary downhill from Surveyor's Ridge to private land would still be expected to occur.

**Alternative 3 – Proposed Action**
**Direct and Indirect Effects**
The apparent range trend toward climax or potential natural community is anticipated to remain static from implementing Alternative 3 without important long-term trend data to confirm this.

Without implementing major vegetation conversion projects in the riparian areas to convert the non-native grasses to native species, vegetation is expected to stay in its current condition.

The generalized responses of riparian ecosystems to the livestock grazing strategies discussion in the previous section under Alternative 2 identifies how a deferred, two-pasture rotational system would be expected to affect riparian/stream systems. The rates of recovery for the riparian areas are dependent on "site potential, current ecological condition, stream geomorphology, and climate" (Elmore, Kauffman, 1994).

Under the Evaluation and Rating of Grazing Strategies (Table3-5), the deferred rotational grazing system rated out lower than the rest rotational system (4 to 5) for fishery needs. The streambank stability and the seasonal plant re-growth also rated out lower than the rest rotation system for Alternative 2; however, the proposed action identifies numerous riparian protection projects that when implemented would more than off set this difference between the two alternatives in relation to riparian concerns.

The deferred-rotational grazing system can be beneficial to sedge/grass communities especially if sufficient re-growth is allowed to provide for adequate riparian function (i.e. enough to retain a capacity to trap sediments) during the next high flow event (Elmore et al, 1994). Utilization in the uplands would continue with 50% use of the current years forage. The current level, amount and locations of range improvements would be modified since some fences would no longer be needed and would be removed (see proposed action map). The maintenance costs of the aging improvements would be expected to increase as time goes by. This would be an increase in operating costs to the permittee to maintain all these improvements to Forest Service specifications.

From a management perspective, the proposed range improvements would reduce intensive management of utilization in riparian areas. In addition, increasing the number of turn-out locations, placing salt blocks in the uplands, and adding alternative water sources should better distribute the cattle across the allotment. When cattle are spread out, they are less likely to overutilize sensitive areas, and are slower to reach utilization limits, making intensive management less likely.

In contrast, the mile-long fence proposed to protect the North Fork Mill Creek drainage would add maintenance costs to both the permittee and the Forest Service. Construction of the proposed fencing (barb-wire and wooden) involves little ground disturbance. The type of vegetation clearing can be done by hand with tools such as bow saws, loppers, or in some cases chain saws for cutting a path 3 feet wide through dead fallen timber. No trees larger than a 3-5 inch diameter would get cut. If a large tree is in the proposed fenceline, then a 2x4 wooden scab is used on this tree to act as a fence post. The fences identified in the proposed action would be located along roadsides, edges of meadows and old timber harvest units. This is done intentionally so there would be limited work clearing brush for a fenceline. This procedure also allows for better success for maintaining the integrity of the fence and prolonging the effectiveness of the project. It also allows easier access for maintenance of the fence. There would be no use of helicopters, but there may be some off road vehicle use.

Livestock would potentially continue the impacts on the private land to the north of this allotment. These impacts would be concentrated use in the riparian areas and potential tree seedling damage in the recently harvested and planted areas. This drift has historically occurred to the north of the allotment on Forest Service roads 17 and 1710 (Fir Mountain road). There has been some occasional drift into The Dalles Watershed on the southern boundary, but a fence that was constructed in 1993 curtailed this. However, this fence is in a poor condition and needs maintenance to bring it up to current specifications. Some drift to the west of the allotment boundary downhill from Surveyor's Ridge to private land would still be expected to occur.

**Cumulative Effects for Both Action Alternatives**

The cumulative effects analysis area is the Long Prairie Allotment and adjacent areas where cattle have been known to drift. Cumulative activities evaluated as part of this analysis include: anticipated timber harvest and prescribed burning proposed as part of the North Fork Mill Creek planning effort; the proposed Forest-wide Invasive Plant Treatment Environmental Impact Statement (EIS); the increase in recreation, including the illegal construction of off-road vehicle trails; and, two ongoing fencing projects that will be implemented in the allotment in September 2005.

The lack of producing new forage in both quantity and quality is not expected to occur in the short term (0-10 ten years) from clear-cut timber harvesting in this area (see Vegetation Suitability/Capability & Production section).

There is an ongoing planning process right now occurring in the North Fork Mill Creek watershed. It is too early in the planning process to determine what exact shape the proposal will take; however it is anticipated that it would include the re-introduction of fire and some timber thinning projects. If this occurs, then there could be some potential new areas of herbaceous forage created from opening up some of these dense overstocked forest stands, where fire and thinning is needed to maintain some of these openings such as meadows and open grassy "park-like" slopes. The quantity and quality is not expected to make a major difference in the current forage capacity figures used for this analysis.

The current noxious weed populations are not encroaching into the forage producing areas (meadows, riparian areas) within this allotment at this time. They currently inhabit disturbed areas such as road sides, burn bays, and former slash piles. The Forest is currently producing a NEPA document that is proposing to control and/or eradicate noxious weeds in this area through various treatment methods. Effective treatment and reduction in weed population densities is not expected to make a major difference in the quantity and quality in the current forage capacity figures used for this analysis. It would however reduce the risk of future encroachment that potentially could occur without any treatment.

Increased recreation by the general public has a potential to increase incidents of livestock versus people interaction. This type of occurrences can make a slight difference in livestock distribution patterns. Cattle may travel on established, recreation trails, although a conflict with recreation has not been documented. There are user-created, illegal, off-road vehicle trails within the allotment that were constructed in early 2005. No cattle were on the allotment at the time. If these trails are still in place when cattle are turned back out, they could change distribution and movement patterns of cattle. However, a temporary area closure has been effective at eliminating off-road vehicle use and the trails have already shown recovery and regrowth. In addition, the

Forest is currently conducting a planning effort to identify new recreation trails in this allotment. The potential from this effort could create new logistical problems for maintaining range improvements for the permittees. Improvements such as fences used to control livestock can sometimes be compromised by the public (cutting wires, or gates left open). This is dealt with on a case by case basis, and is operationally part of the discussions held with the permittees before they turn cattle out onto the allotment.

Cumulatively, there would be an increase in fence maintenance across the allotment. There are approximately 10 miles of boundary and pasture division fences existing on the allotment. Some are in good condition and would not need repair for 5-30 years. Others would need reconstruction and/or maintenance before cattle are turned back out onto the allotment (see Annual Allotment Maintenance, page 20). In addition, the Forest Service, together with the Confederated Tribes of the Warm Springs Indian Reservation is constructing two exclosure fences in September 2005. One would exclude cattle out of the riparian area along West Fork Neal Creek (just north of the current corrals in Long Prairie) and the other would exclude cattle from the western-most headwaters fork of West Fork Neal Creek to protect this area from cattle trampling and stream crossings. There would be a small increase in the amount of barbed wire fence to maintain in the long term (approximately 200 yards). The Forest Service works together with the permittee to construct new range improvements, but ultimately it is the permittee's responsibility to maintain these improvements once they are constructed. (The Forest Service is responsibly for all of the wooden, "buck-n-pole" fences.) All of the fence maintenance combined would have an increased economic impact to the permittee.

As part of the Long Prairie exclosure fence project, the Long Prairie corral will be relocated from its current location in Long Prairie to a site where the permittees locate their camper trailer. The permittees would bring in livestock panels to load and gather their livestock at this new location in the fall at the season's end. This will create more work for the permittee to set these temporary panels up and take them down after gather. This will also add a small additional effort and time needed to do range improvement inspections by Forest Service personnel. In addition, the boundary fence around Long Prairie meadow would need some redesigning by Joe's Spring water trough to allow the livestock access to water in the fall, adding to allotment preparation costs and labor.

**Cumulative Effects Unique to Alternative 3**
The cumulative increase in fenced exclosures along riparian areas should reduce the necessity for herding and increased management in sensitive areas.

# Economic Efficiency

A comprehensive economic efficiency analysis requires all economic benefits and costs be identified and compared by alternative to determine cost efficiency (36CFR 219.3, definition of suitability and 36 CFR 219.20(b)). Determining if areas are not economically efficient (i.e. discounted costs exceed discounted benefits) under circumstances expected to prevail during the life of this plan is classified as other than suitable. The present net value (+,-,0) calculated over one decade is a reasonable approximation of expected plan life. NFMA does not require the present net value to be positive for rangelands to be classified as suitable. In lieu of a

comprehensive analysis, an economic analysis based on identifiable and quantifiable costs is presented.

Quantifiable economic information on the benefits of alternatives is not available because of the difficulty in obtaining quantifiable data of the relationship between project outputs and resource impacts. For example, the flow of benefits from maintaining or enhancing ecological status and viability of riparian areas is difficult to quantify from an economic standpoint. The main problem from an analysis standpoint is that these resources are not typically allocated through a well functioning market system. Consequently, price and quantity information is frequently not available for a particular resource. This, along with the incomplete information on the production function relationship between project activities and a quantifiable effect on a given resource, makes it difficult to impossible to identify and measure economic benefits.

This economic efficiency analysis addresses the concern that reducing permitted livestock levels would affect the economic viability of the ranch operations because of costs associated with securing replacement range, installing and maintaining fences, establishing waters on replacement range, and increasing the frequency of cattle trucking to reach replacement range and the economic effect on the local community. In addition there may be an overall increase in the time required by permittees to manage ranch operations.

This analysis focuses on three key indicators of change by alternative: 1) change in number of permitted animal months; 2) change in management intensity (increase or decrease in operations time); and, 3) cost to implement the alternative. Table 3-6 compares the alternatives as they relate to these key economic indicators for the allotments. Alternative 2 is used as the baseline for comparison purposes. The table uses 0 to indicate no change from the baseline, - (minus) to reflect a decrease or negative impact to the permittee, and + (plus) to reflect an increase or positive impact to the permittee.

**Table 3-6. Comparison of Alternatives by Key Economic Indicators**

| Indicator | Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|---|
| Permitted AUMs | - | 0 | 0 |
| Operations Cost | - | 0/- | 0/- |
| Implementation Cost | - | 0 | 0/+ |

**Alternative 1 – No Grazing**

**Direct and Indirect Effects**

Financially, the direct effect to the permittee of closing this allotment to commercial grazing would equate to an increase in livestock operating costs. The permittee would have to secure summer grazing land for his herd of 52 cow/calf pair (240 AUMs). The current rate for federal rangeland is $1.79 per AUM for the 2005 grazing season. The current estimates on the cost of private grazing land during summer months can vary locally depending on the amount and

quality of forage, the type of terrain, and the type of improvements located on each range. The amount charged for native range (with minimally maintained range improvements) on Oregon State lands can vary between $7.00 and $11.00 per AUM. The amount charged for irrigated pasture (with sizeable range improvement responsibility) on Oregon State lands can vary between $11.00 and $15.00 per AUM (White River Wildlife Refuge Manager, personal communication).

The effects financially of eliminating grazing would also be associated with livestock operating costs the permittee normally incurs by placing his livestock on federal lands. One example might be not as much money spent for items such as gasoline, upkeep and maintenance on vehicles and trailers needed to travel the approximately 70 miles roundtrip from their home ranch in The Dalles, Oregon to the allotment. This in turn may reduce the amount of services purchased locally. Another example would be the costs of supplemental feed that would be needed if access to this grazing allotment were to be eliminated.

The impacts of canceling livestock grazing on this allotment in relation to impacting overall livestock production in Wasco County can be viewed in a number of ways. For example the permittee would be required to obtain local rangeland to offset the lack of federal rangeland. This in turn would invest more dollars into the local community. However, this economic hardship to the permittee might eventually drive them out of business due to increased overall production costs, which in turn then would mean less dollars going into the local community over the long term for items such as supplemental feed or veterinary services

There would also be a one-time cost to the Forest Service to remove these range improvements deemed not necessary for other uses. The grazing receipts from 2004 ($1.79/AUM) for this allotment were $264.55. Since only one permittee utilized this allotment, this was only half of what the total fees have historically been, which averages approximately $530.00, depending on that year's grazing fee. At a minimum, the Forest Service receives 50% of grazing fees back to do range betterment work. (The Public Rangelands Improvement Act (PRIA) of 1976 allows up to 50% of the grazing fees to go back to the Forest where the grazing fees were generated. These funds are to be used for range improvements such as grassland maintenance or water development projects.) These funds are to be used for on-the-ground improvements of the range resources. This Forest receives approximately $1,000.00 to $3,000.00 total in annual Federal allocation for range betterment. Implementing this Alternative would equate to an approximate reduction in this figure by $132.00 to $264.00.

The costs to the Forest Service (internal costs; monitoring, use supervision and compliance, meetings etc.) would essentially remain the same since the Mt. Hood National Forest has four other allotments and those areas would still need permit administration. The difference would mean more time could be spent on other allotments.

**Cumulative Effects**

The cumulative effects analysis area is the Mt. Hood National Forest. The cumulative effects of canceling livestock grazing on this allotment in relation to the Mt. Hood National Forest's overall grazing program would be a reduction of 5% in both AUMs, and headmonths. The

reduction in the overall acres available for livestock grazing on the Mt. Hood National Forest would be a reduction of 3%.

**Alternative 2 – Current Management with Slight Modifications**
**Direct and Indirect Effects**
Financially, the direct effect to the permittee of continuing current management would equate to a slight increase in livestock operating costs from the seasonal variation in federal grazing fees when and if they increase in any given year, and the cost to reconstruct and maintain the older range improvements. The indirect costs associated with this permit would remain the same as the current situation.

The costs to the Forest Service (internal costs; monitoring, use supervision and compliance, meetings etc.) would essentially remain the same since the Mt. Hood National Forest has four other allotments and those areas would still need permit administration; the implementation of this allotment could not quantitatively be broken out into a sizeable difference.

The grazing receipts from 2004 ($1.79/AUM) for this allotment were $264.55. Since only one permittee utilized this allotment, this was only half of what the total fees have historically been, which averages approximately $530.00, depending on that years grazing fee. At a minimum, the Forest Service receives 50% of grazing fees back to do range betterment work. These funds are to be used for on-the-ground improvements of the range resources. This Forest receives approximately $1,000.00 to $3,000.00 total annually for range betterment. Implementing this Alternative would maintain this figure by $132.00 to $264.00.

**Cumulative Effects**
The cumulative effects of continuing current management on this allotment would be expected to maintain the status quo and would not change from the current situation now occurring on this allotment.

**Alternative 3 – Proposed Action**
**Direct and Indirect Effects**
Financially the direct and indirect effects to the permittee from implementing the proposed action would be a slight increase in the cost of range improvement construction in the short term and a slight increase in improvement maintenance in the long term, since some of the older fences will need reconstruction and there are two new fences proposed (a total of 2-3 miles) and cattleguards that would require maintenance at some point down the road. There would also be a slight increase in operating costs associated with the additional management of moving the livestock more often to meet resource objectives by preventing resource damage. However, this cost would in the long term be offset by the potential increase in the number of livestock permitted by increasing AUMs once fences are constructed and if resource objectives are achieved and maintained.

The costs to the Forest Service (internal costs; monitoring, use supervision and compliance, meetings etc.) would essentially remain the same since the Mt. Hood National Forest has four other allotments and those areas would still need permit administration, and implementation of this allotment could not quantitatively be broken out into a sizeable difference. A slight increase would occur through range improvement inspections; however, the new improvements in place

would also equate to less time spent in the field to conduct use supervision and compliance. There would also be a slight increase in the time spent conducting adaptive management monitoring.

The grazing receipts from 2004 ($1.79/AUM) for this allotment were $264.55. Since only one permittee utilized this allotment, this was only half of what the total fees have historically been, which averages approximately $530.00, depending on that years grazing fee. At a minimum, the Forest Service receives 50% of grazing fees back to do range betterment work. These funds are to be used for on-the-ground improvements of the range resources. This Forest receives approximately $1,000.00 to $3,000.00 total annually for range betterment. Implementing this Alternative would maintain this figure by $132.00 to $264.00.

**Cumulative Effects**
The cumulative effects analysis area is the local community. The cumulative effects of implementing the proposed action in the short term would have a slight increase in operating costs to the permittee which would equate to a slight benefit financially to outside local interests for services for vehicle repairs, maintenance and gasoline. Over the long term this cost would be expected to level out; however, if the permittee were able to increase his livestock numbers (AUMs) this would have a benefit to local interests such as increased veterinary costs, supplemental feed, and various operational costs.

# Invasive Plant Species

## Existing Condition

Invasive species (also called noxious weeds) are non-native plant species that can inhabit and negatively alter native plant communities and ecosystems. The Oregon State Weed Board defines them as "exotic, non-indigenous, species that are injurious to public health, agriculture, recreation, wildlife or any public or private property" (Oregon Department of Agriculture, August, 1999). The Oregon weed policy and classification system has been developed by the state of Oregon to provide a way to prioritize control programs for these species and to restrict their spread and effect on the environment. The following noxious weeds are identified by the Oregon Department of Agriculture (ODA) and are known to occur within the Long Prairie Grazing Allotment. Any future decision on treatment of noxious weeds present would come from the Forest-wide (Mt. Hood) Site Specific Invasive Plant Treatment Environmental Impact Statement (EIS), expected to be published in late 2005.

The following invasive plant species are known to be in the area:

| Table 3-7. Existing Invasive Plant Species in the Allotment |
|---|
| Diffuse knapweed (*Centaurea diffusa*) |
| Spotted knapweed (*Centaurea maculosa*) |
| Canada thistle (*Cirsium arvense*) |
| St. Johnswort (*Hypericum perforatum*) |
| Meadow knapweed (*Centaurea pratensis*) |
| Tansy ragwort (*Sencio jacobaea*) |
| Butter and eggs (*Linaria vulgaris*) |

Diffuse, spotted, and meadow knapweeds, and tansy ragwort are "road runners" and can be found along some of the major roads in this allotment such as Forest Service roads 17, 1711 and the 17660. These species also occur on disturbed areas such as past timber-harvested units (landings/slash piles and skid trails), roadside prisms, off-highway vehicle (OHV) trails, trailheads, and dispersed campsites. Diffuse knapweed is also located in the Kiyi Quarry pit on Forest Service road 1710. Forested areas with little disturbance and at least 70% canopy closure are generally weed free from these two species.

St. Johnswort, is located along Forest Service Road 17. The butter and eggs occurs in one small population along Forest Service Road 17660 by the 013 spur intersection. Canada thistle occurs in some of the older timber harvested areas within the Long Prairie Allotment (Bronco Timber Sale-1972-73, Pigeon Timber Sale-1985-86).

All of the existing invasive species are categorized as "B-Rated Species" according to the Oregon Weed Policy and Classification System. This classification defines these species as having an economic importance which is regionally abundant, but which may have limited distribution in some counties. Where implementation of a fully-integrated statewide management plan is infeasible, biological control shall be the main control approach. The recommended action for B rated species is to limit treatment to intensive control at the state or county level as determined on a case-by-case basis. Spotted knapweed is also known as a priority noxious weed designated by the Oregon State Weed Board as a target weed species on which the Department will implement a statewide management plan (T-Rated Species, Oregon Weed Policy and Classification System-Appendix 1, ODA, 2001).

Treatment is not proposed as part of this proposed action. These identified sites are proposed as part of the Forest-wide (Mt. Hood) Site Specific Invasive Plant Treatment EIS. The exact proposal and the anticipated effects will be analyzed through a separate environmental analysis. Although a decision has not been made on which methods of treatment would be used for control and/or eradication, the Forest Service is proposing methods of active and passive restoration including herbicide, manual, and mechanical treatments.

At the current time, the Forest Service is not treating these infestations, except for some occasional hand-pulling by the Hood River County Weed specialist. The current permittee and the former permittee (under the waived permit) manually hand-pulled noxious weeds in the past within the allotment (Joe Miller, Helen Sallee, and May Proctor, personal communication).

## Effects Analysis

### Alternative 1 – No Grazing

### Direct and Indirect Effects

Eliminating commercial livestock grazing from the area is not expected to alter the current populations of noxious weeds, since the plants are already well established and are out-competing the native and non-native vegetation in those areas where they occur. Since one vector of spread and/or establishment would be removed, the prospect for newly established populations of noxious weeds, or expanding the area of infestations that currently exist could be expected to slow down. The amount and time for this to slow down would be difficult to

estimate since there are other vectors still occurring in this area at the present time (i.e. recreation, wildlife, special-uses). It is likely that noxious weeds would continue to spread from the other activities/vectors occurring in this area, especially along roadsides.

**Cumulative Effects**
Under the no action alternative, cattle would be removed from the allotment and would not contribute to the spread and/or introduction of noxious weeds. Therefore there are no cumulative effects from this alternative.

**Alternative 2 – Current Management with Slight Modifications**
**Direct and Indirect Effects**
Under Alternative 2 the effects of cattle grazing on the current level, infestation size and rate of spread of the noxious weeds would be expected to stay the same. The livestock do not utilize (consume) the noxious weed species given the amount of desirable and available vegetation (grasses). Cattle generally prefer grasses and forbs to woody vegetation, at least when the herbaceous vegetation is green (Gillen and others 1985, Holechek and Vavra 1983, Kovalchik and Elmore 1992). Where grazing activities might introduce or spread noxious weeds is when actions create soil disturbance or bare ground. These areas become potential sites for weed establishment. However, the current populations of noxious weeds are already established and are out-competing the native and non-native vegetation in those areas where they occur such as road prisms, landings and slash piles.

Cattle do have the potential to remove vegetation and create bare ground by trampling soils if they are concentrated in areas (Hall/Bryant, 1995). In Alternative 2, cattle would most likely continue to concentrate in riparian areas of North Fork Mill Creek, and could disturb the soils in those areas. However, the prospect for newly established populations of noxious weeds, or expanding the area of infestations that currently exist are expected to be moderate. The areas where invasive species are already established are along roads and severely disturbed sites; they are not currently near the riparian areas and prairies within the allotment where cattle have tended to congregate.

There would be a **Moderate** risk of noxious weed infestation/spread and establishment by implementing this alternative along with the identified mitigation measures (see Noxious Weed Risk Assessment in the project file).

**Alternative 3 – Proposed Action**
**Direct and Indirect Effects**
The livestock do not utilize (consume) the noxious weed species given the amount of desirable and available vegetation (grasses). Cattle generally prefer grasses and forbs to woody vegetation, at least when the herbaceous vegetation is green (Gillen and others 1985, Holechek and Vavra 1983, Kovalchik and Elmore 1992). Where grazing activities might introduce or spread noxious weeds is when actions create soil disturbance or bare ground. These areas become potential sites for weed establishment.

The anticipated results from implementing the proposed action in this allotment would be expected in the short term (2-4 years) to continue the current level, infestation size and rate of

spread of the noxious weeds. However, in the long term (>4 years) this alternative would be expected to slow down this trend and current rate of spread and establishment of noxious weeds. The amount and time for this trend to slow down could be difficult to measure, but with the range improvements in place, cattle should be better distributed and less bare ground should be created through trampling.

In Alternative 3, it is less likely that the number of livestock would be increased compared to Alternative 2 (based on the resource trend that would be necessary as part of adaptive management before AUMs could be increased). Having fewer livestock on the allotment and the addition of identified range improvements (fencing) to control movement of the livestock, it is expected that less bare ground (acreage) within this allotment would be created. The proposed fencing would keep the livestock out of areas they tend to concentrate in, such as riparian areas, and the meadows. However, the prospect for newly established populations of noxious weeds, or expanding the area of infestations that currently exist are expected to be moderate. The areas where invasive species are already established are along roads and severely disturbed sites; they are not currently near the riparian areas and prairies within the allotment where cattle have tended to congregate.

There would be a **Moderate** risk of noxious weed infestation/spread and establishment by implementing this alternative along with the identified mitigation measures (see Noxious Weed Risk Assessment in the project file).

**Cumulative Effects for Both Action Alternatives**

The potential analysis area for noxious weeds is as far as humans, livestock (recreational), wildlife, or vehicles can carry noxious weed seeds outside of the allotment. The focus of this analysis is on the grazing activities on the Long Prairie Allotment and the cumulative contribution to the introduction and spread of noxious weeds together with other activities in the area.

Assumptions include: U.S. Forest Service has only a slight influence on the movement of humans, recreational livestock, wildlife, and vehicles in or out of this allotment. The cattle under this permit can be controlled by the permittees actions (riding, herding, fencing, etc.). Once a small infestation is detected, the rate of spread can be controlled. Mitigation measures such as washing machinery before it enters the allotment area, and an active treatment program can control the rate of spread. The Mt. Hood National Forest is in the process of completing an EIS that would allow for various kinds of treatment (including herbicides) in dealing with invasive species/noxious weeds. Current locations of weeds in this allotment proposed for herbicide treatment as part of the EIS are along Forest Service roads 17, 17660, 17650, 17451, 17660-013; Kiyi Pit Quarry; the BPA powerline in section 35; and the Bald Butte Utility Corridor.

The establishment of a noxious weed treatment program with many treatment methods available is expected to control and/or eradicate the identified invasive species in the allotment. The use of herbicides has been a part of the Barlow Ranger District's noxious weed control program (since 1999). The data collected from this program indicates that spotted and diffuse knapweeds have been almost eliminated along some of the major road corridors (Forest Service roads 48 and 44), within three consecutive years of treatment by utilizing herbicides (Barlow RD, weed database,

2005). Yellow toadflax has been completely eliminated from two locations on Barlow through this program. Many actions have and would continue to contribute to the risk of new weed populations and the spread of existing weeds on the Hood River District until a more effective treatment method is implemented. Other vectors occurring in this area at the present time (i.e. recreation, wildlife, special uses) would contribute to any expected rate of spread. These new weed populations would be a source of seed to outside the allotment boundaries into un-infested areas.

Before treatment, spread along road prisms would be expected to continue. Recreation has increased in the area and this human presence acts as a vector both on roads and trails within and outside of the allotment. There are user-created, illegal, off-road vehicle trails within the allotment (through Gibson Prairie) that were constructed in early 2005. Cattle and wildlife may travel on established, recreation trails and act as another vector (together with recreationists) contributing to a spread of established noxious weeds to areas without established populations. However, a temporary area closure has been effective at eliminating off-road vehicle use and the trails have already shown recovery and regrowth. If the area closure proves effective in the long term, the potential for spread into new areas would be reduced. The Forest is also currently conducting a planning effort to identify new recreation trails in and around the allotment area. It is too early in the planning stages to know if the proposal will include new trails; however, an increase in recreationists and trails in the area could contribute to an increase in the spread of already established noxious weeds (without the treatment proposed as part of the Forest-wide EIS.

There is an ongoing planning process occurring in the North Fork Mill Creek watershed. It is too early in the planning process to determine what exact shape the proposal will take; however it is anticipated that it would include the re-introduction of fire (prescribed burning) and some timber thinning projects. Prescribed fire could help reduce the populations of non-natives and spur the growth of native species. Timber activities have the potential to create bare ground in the short term and could increase the risk of establishing new infestations.

# Hydrology

A more detailed hydrology report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below.

## Existing Condition

Allotment boundaries overlap three 5$^{th}$ field watersheds: Middle Columbia - Mill Creek, East Fork Hood River and the Lower Hood River (Figure 3-2). The allotment encompasses the headwaters of two 6$^{th}$ field watersheds: North-South Forks Mill Creek, and Neal Creek. The Forest Service recently redefined 5$^{th}$ and 6$^{th}$ field watershed boundaries. The allotment is located within portions of four 7th field watersheds, West Fork Neal Creek, Mosier Creek, North Fork Mill Creek, Neal Creek, and Lower East Fork Hood River. 7$^{th}$ field watersheds are fairly small in size, averaging 1000 to 2000 acres. The majority of the allotment is in West Fork Neal Creek and North Fork Mill Creek. North Fork Mill Creek is part of a Tier 1 Key Watershed as identified in the Northwest Forest Plan.

There are many streams, springs and wetlands located within these sub-watersheds. The primary streams include West Fork Neal Creek, Mosier Creek, and North Fork Mill Creek. There are approximately 12 miles of stream in the allotment in the following categories: 7.3 miles of perennial streams (flow year around) and 4.7 miles of intermittent streams (streams that dry up for part of the year and do not contain fish).

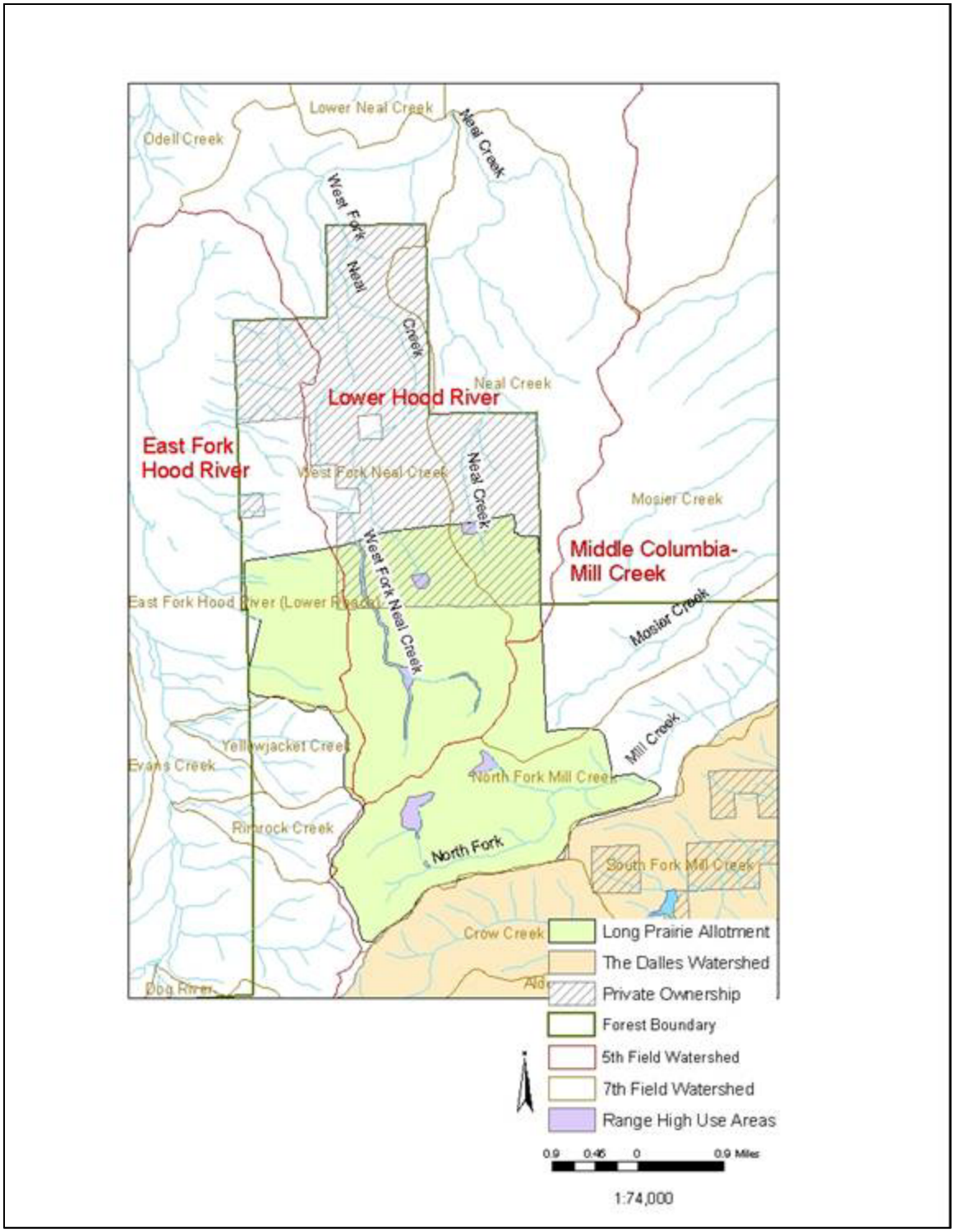


**Figure 3-2. Fifth and seventh field watersheds that lie within the Long Prairie Allotment boundaries in the Mt. Hood National Forest.**

**Water Quality**

*Stream Temperature*

Water temperature data has been collected by the Forest Service on the above mentioned stream systems for many years. Data has been collected on continuous temperature recording dataloggers in North Fork Mill Creek for the past 6 years and West Fork Neal Creek for the past 10 years (see Figure 3-3 below). Random stream temperatures were collected during stream surveys in North Fork Mill Creek and West Fork Neal Creek.

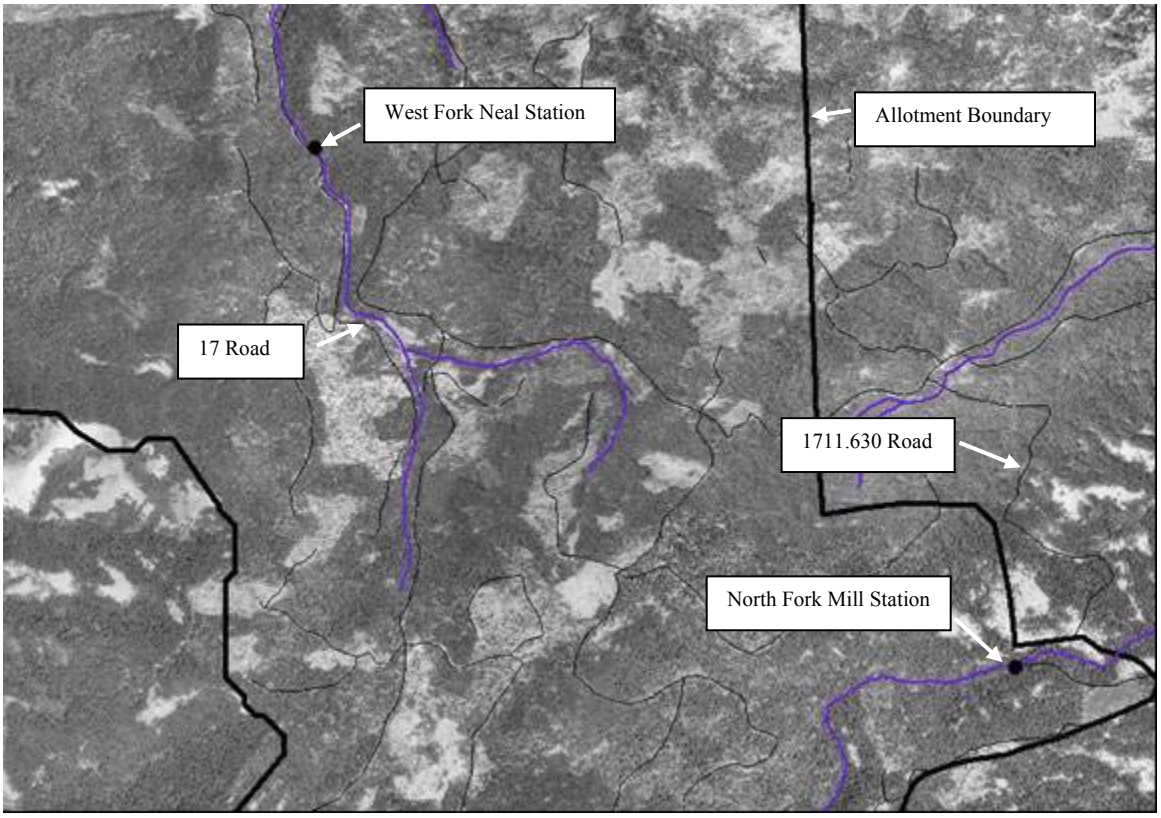


**Figure 3-3. Water Temperature Monitoring Sites in the Long Prairie Grazing Allotment.**

The 7-day average maximum stream temperatures in degrees Celsius for the years deployed ranged as follows:

**Table 3-8. Seven-Day Average Maximum Stream Temperatures**

| Stream | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| North Fork Mill Creek | ND | ND | ND | ND | ND | 14.0 | 14.0 | 14.6 | 14.5 | 13.4 |
| West Fork Neal Creek | 14.8 | 14.4 | 14.6 | 13.5 | 14.9 | 13.3 | 13.2 | 13.7 | 14.3 | 13.8 |

ND = Not Deployed for that Year

Water temperatures in West Fork Neal Creek and North Fork Mill Creek on federal lands are generally quite cool, rarely exceeding 13.9 °C, the National Marine Fisheries Service (NMFS)

threshold water temperature for "properly functioning" watersheds where steelhead habitat occurs (NMFS, 1996), and meeting State of Oregon water quality standards (17.8 °C). Seven-day average maximum temperatures did exceed the threshold of 13.9 °C in both creeks, usually in mid-summer, for 3-18 days depending on the creek and year. None of the days when this threshold was exceeded occurred during the spawning period, all were within the migration and rearing period. Handheld thermometer readings taken in West Fork Neal Creek in the headwaters during the 1999 stream survey exceeded 20 °C and could be cause for concern (USFS, 1999).

There is limited water temperature data available for Neal Creek above its confluence with West Fork Neal Creek. Data collected in 2003 at the old forest boundary indicates Neal Creek temperatures follow a pattern very similar to that seen in West Fork Neal Creek. It is likely this pattern holds true for other years where data was not collected. In 2003, there were only two days where temperatures exceeded 13.9 °C, the NMFS steelhead criteria for properly functioning. Data collected by the Hood River Watershed Group (HRWG) in 1998 at the confluence of Neal and West Fork Neal Creeks (located approximately 5 miles below the National Forest boundary) found seven-day average maximum temperatures of 14.8 °C in Neal Creek and 17.0°C in West Fork Neal, indicating a greater heat contribution from the West Fork. This also indicates a general warming trend in a downstream direction – a situation not unexpected and one that likely occurs in North Fork Mill Creek as well. In fact, North Fork Mill Creek is on the 2002 State of Oregon 303d list of water quality limited streams for water temperature. This list identifies water bodies within the State of Oregon that are not meeting state water quality standards. The segment of creek that is listed is from river mile 0 to 3.7, which starts over 3 miles downstream from the National Forest boundary. Activities on stream sections in the National Forest that supply this segment still need to be considered as they can influence water temperature in the listed area. Recorded stream temperatures displayed in Table 3-8 are below State of Oregon seven-day average maximum standards of 16.0°C for North Fork Mill Creek and 18.0°C for West Fork Neal Creek (Draft 2004 listing criteria, Oregon State Dept. of Environmental Quality).

*Stream Channel Condition and Sediment*

Both West Fork Neal and North Fork Mill Creeks have low channel gradient headwaters and steeper, more confined middle sections. Dave Rosgen has developed a stream channel classification system that groups channels with similar physical characteristics together in an effort to predict behavior and recovery potential of channels. The upper section of West Fork Neal Creek (area around Long Prairie) is a "C4" Rosgen channel type that is actively downcutting. Rosgen (1996) identified riparian vegetation as having a "very high" controlling influence on the stability of a C4 channel. He also identified this channel type as having a "very high" sensitivity to disturbance from increases in sediment.

Frequent trampled streambanks due to cattle use were identified on portions of West Fork Neal Creek during the 1993 and 1999 stream surveys, from river mile 6.45 to 8.8 (the area within the allotment). This was further verified during field visits by the Forest Service hydrologist, soil scientist, and fisheries biologist conducted in the summer and fall of 2004. Numerous areas of bank trampling, fine sediment introduction, channel downcutting and riparian vegetation removal were noted and mapped along a 0.5 mile section of West Fork Neal Creek in the Long Prairie

area. A total of 27 areas of bank trampling and 23 stream cattle crossings or an average of 1 crossing or trampled bank every 50 feet of stream were identified. This represents approximately 1500 feet² of concentrated disturbance in the 0.5-mile section of stream. This is a high use area for cattle due to the location of the main corral where the cows are turned out and gathered every year.

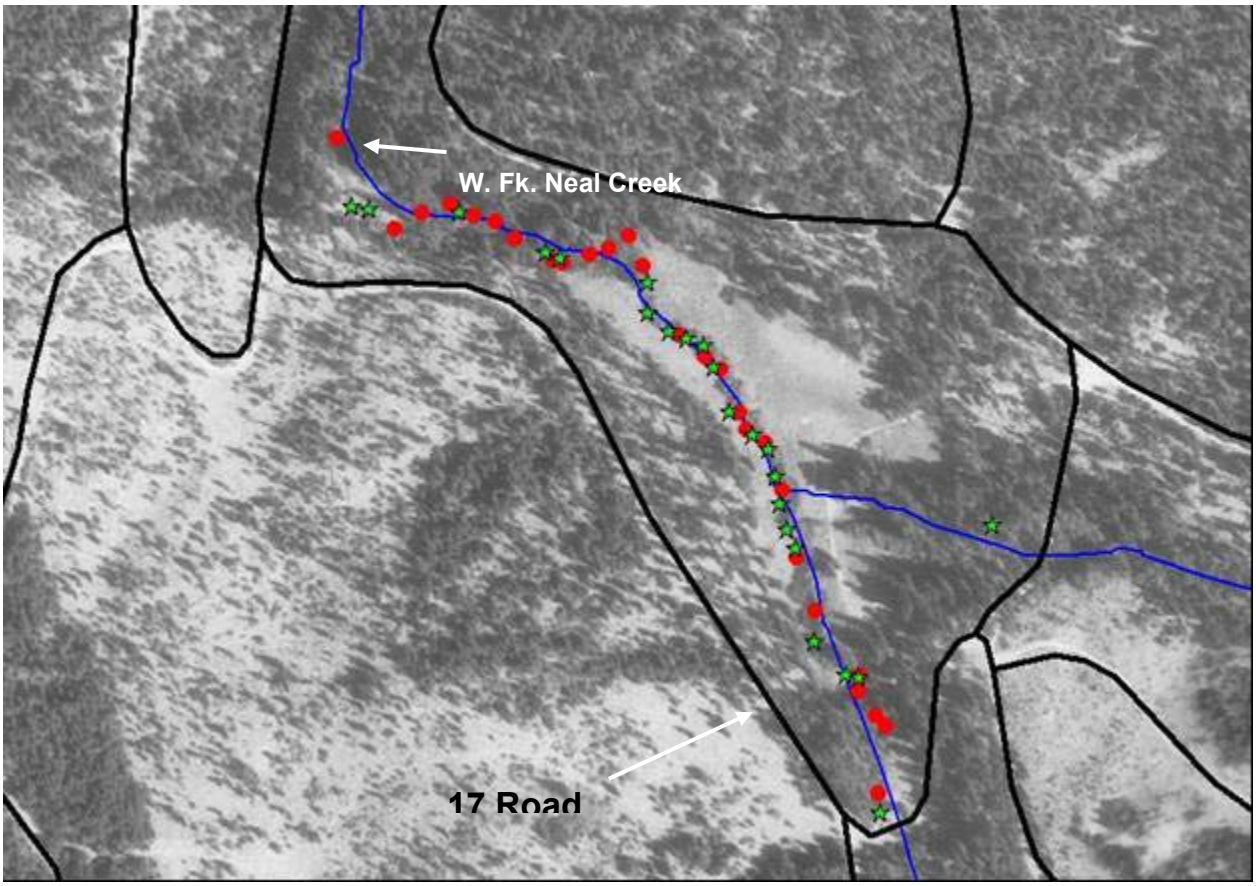


**Figure 3-4. Areas of bank trampling and cattle crossings mapped on West Fork Neal Creek during the fall of 2004.**

Bank trampling points are shown as red points. Cattle crossings are shown as green stars.

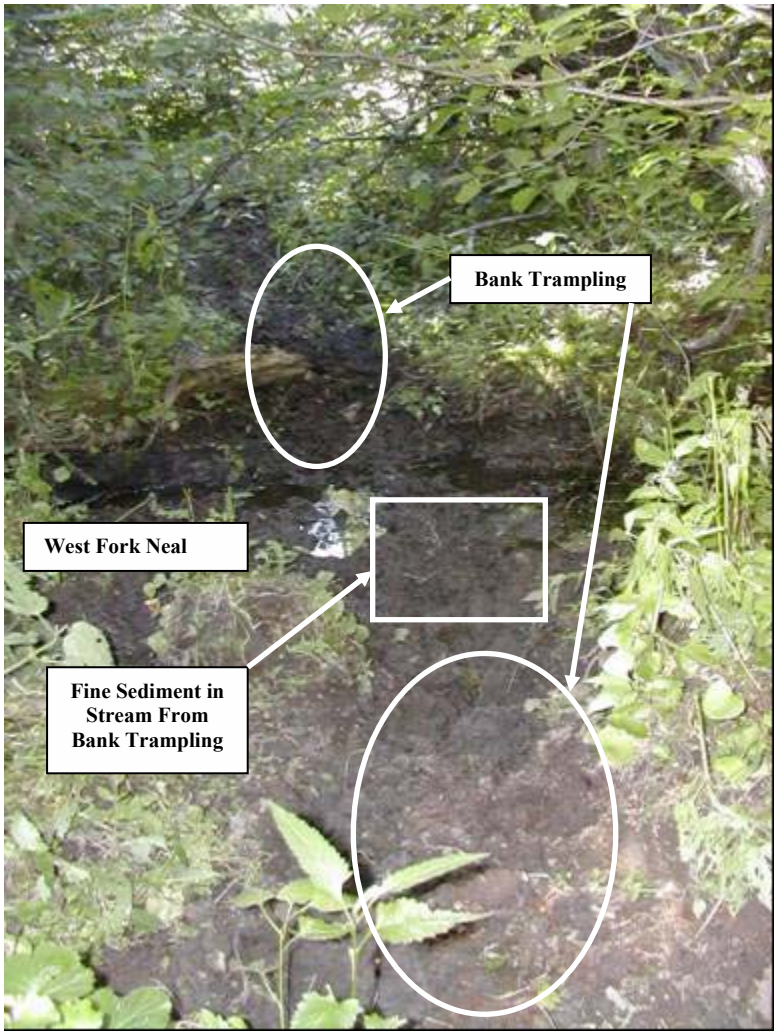


**Figure 3-5. Photograph showing a cattle crossing on West Fork Neal Creek at the Long Prairie Corral. Photo was taken in the fall of 2004-Notice bank trampling and direct introduction of fine sediment into the West Fork**

The upper reaches of North Fork Mill Creek (area around Gibson Prairie) are of similar channel type and similar general channel condition to those described for West Fork Neal Creek. North Fork Mill Creek is undergoing more severe channel downcutting around Gibson Prairie than West Fork Neal, due in part to the loss of riparian vegetation from grazing. The Mill Creek Watershed Analysis noted degradation of Gibson Prairie due to cows keeping "riparian grasses short" and physically altering the streambanks. "The ephemeral streams within the meadow complex are actively downcutting which has resulted in a lowered water table, effectively draining the meadow" (Ch-III-Q3-1). This was also verified during field visits during the summer of 2004.

Other sub-watersheds (such as Mosier Creek, Neal Creek and Lower East Fork Hood River) have low use or minor influence due to steep topography or the fact that only very small portions of the allotment are located in the sub-watershed.

Another potential source of coarse and fine sediment to surface water in the area is roads. Sediment can wash off road surfaces into adjacent streams. Road density (miles of road per square mile of basin) can be used as a general indicator of potential problems associated with roads. Road densities within a sub-watershed that exceed 3.0 miles per square mile indicate areas that should be examined more closely for specific sediment related problems, although it is possible to have isolated areas of road instability even in areas of low road density. This value is based on professional judgment by local (Gifford Pinchot National Forest) Forest Service hydrologists, fish biologists, and earth scientists. Following is a table displaying total specified road densities for sub-watersheds within the allotment.[1]

**Table 3-9. Road Densities in Subwatersheds**

| Sub-watershed | Road Density (mi/mi2) |
|---|---|
| West Fork Neal Creek | 4.0 |
| Mosier Creek | 3.2 |
| North Fork Mill Creek | 3.2 |
| | |

Stream surveys of West Fork Neal Creek noted an average of 27% fine substrate (silt/sand, organics) from river mile 0 to 2.0 (1993 ODFW survey) and river mile 2.3 to 8.8 (1999 USFS survey). This higher percentage of fine sediment in the channel may be due, in part, to cumulative sources such as bank trampling and channel incision in the Long Prairie area.

**Riparian Area Condition**

The riparian area adjacent to a stream or wetland is important in providing wildlife habitat, as well as bank and channel stability (the roots of riparian plants and trees hold soil in place). In many cases, this vegetation also shades the stream and regulates water temperatures. As discussed in the "Stream Channel Condition and Sediment" section of this report, cattle have removed riparian vegetation in localized areas in the allotment. This is done by grazing as well as trampling and is most evident in high use areas such as Long Prairie and Gibson Prairie. Since the C4 channel type is very sensitive to riparian vegetation removal, this has caused some channel modification in the form of downcutting most notably in upper North Fork Mill Creek.

[1] Note: the road density given here is different than the density listed in the wildlife section. For wildlife purposes, the standard is focused on *open* road density and is calculated using the area within the allotment. The road density listed in the hydrology section uses the entire watershed as the area of interest and uses *total* road density, both open and closed roads.

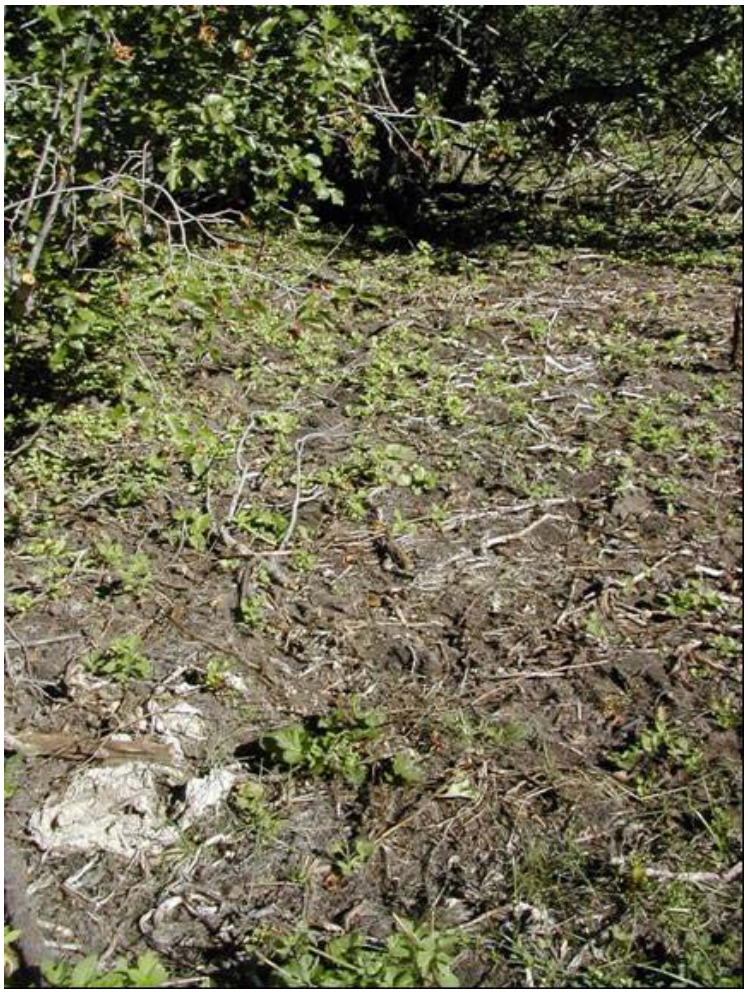

**Figure 3-6. Photograph of riparian area vegetation along West Fork Neal Creek that has been grazed and trampled. This is near the Long Prairie corral.**

In addition to riparian vegetation removed due to cattle activity, riparian vegetation has been removed by past timber harvest activity. An analysis of the percentage of Riparian Reserves that have been removed by timber harvest on National Forest System land was completed and is displayed in the table below. This gives a general idea about the current condition of the riparian area.

| Table 3-10. Harvest of Riparian Reserves | |
|---|---|
| **Sub-watershed** | **% Riparian Reserve Harvested** |
| West Fork Neal Creek | 4% |
| Mosier Creek | 0% |
| North Fork Mill Creek | 20% |
| | |

North Fork Mill Creek has a riparian reserve harvest level of 20%. The other 7$^{th}$-fields watersheds have a very low harvest level. These created openings were pre-Northwest Forest plan (Riparian Reserves were not in place at the time), so very few large trees were left adjacent

to streams. The riparian reserves are recovering as planted trees are growing and providing shade and other benefits to the aquatic system.

## Effects Analysis

### Applicable Standards and Guidelines for Hydrology and Aquatic Species:

*Northwest Forest Plan*

- GM-1 – Adjust grazing practices to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives. If adjusting practices is not effective, eliminate grazing.
- GM-2 – Locate new livestock handling and/or management facilities outside riparian reserves. For existing livestock handling facilities inside the Riparian Reserve, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.
- GM-3 – Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.

On March 22, 2004 the Northwest Forest Plan was amended to change the documentation requirements with regard to the Aquatic Conservation Strategy (ACS). There is no long a need to document how project-level analyses are or are not consistent with ACS objectives. Consistency must be documented through the description of the existing condition, the effects of the project on the existing condition, and enough information for the decision maker to consider any relevant information from applicable watershed analyses. The Mill Creek Watershed Analysis was used in this analysis.

*Mt. Hood National Forest Land and Resource Management Plan*

All Forest wide Water Quality Standards and Guidelines along with Forest wide Riparian Area and B7 General Riparian Management Area Standards and Guidelines apply to this allotment. In addition, the following standards apply:

- Ground disturbing activities should not occur in saturated soil areas (FW-083).
- Activities within and adjacent to riparian areas should not accelerate sediment delivery to streams, lakes, wetlands, seeps, and springs (FW-084).
- Streambank and/or shoreline stability of the riparian management area shall be maintained in its natural condition (FW-102). If the existing streambank condition is degraded due to past management activities, the natural condition should be restored (FW-103).
- Range management and/or improvement activities (e.g., structural facilities) shall be designed to not concentrate livestock in riparian areas (B7-024). Livestock salt blocks, watering troughs, corrals and loading chutes shall not be permitted (B7-025).
- Riparian communities which have sustained substantial impacts (e.g., degraded streambanks and severe soil compaction) due to heavy livestock use, shall be rehabilitated (B7-026). Livestock access may be precluded (B7-027).
- Habitat for threatened, endangered, and sensitive plants and animals shall be protected and/or improved (FW-175).

**Introduction**

Considerable literature is available documenting the effects of cattle grazing to water quality. Grazing as presented in the action alternatives would constitute a potential non-point source of water quality impairment. The primary pollution that may result from livestock grazing is water temperature, sediment, pathogens, nutrients and total organic carbons. The following table outlines the contaminants, the specific pollutant and the basis for concern for this pollutant (EDMUD Watershed Sanitary Survey, 1995).

**Table 3-11. Contaminants to Water Quality**

| Contaminant Group | Pollutant Measure | Basis for Concern |
|---|---|---|
| Water Temperature | Stream Temperature | Loss of riparian shading due to livestock grazing and trampling can increase stream temperature. This increased water temperature could cause stress or mortality to aquatic organisms. |
| Sediment | Turbidity | Soil erosion from animal activity can mobilize microbes, nutrients and toxic chemicals that are stored in the soil. Fine sediment can also degrade aquatic organism habitat by filling in gravels and pools in adjacent streams. |
| Nutrients (Organics) | Nitrates and Phosphates | These originate from animal excrement. They promote algal growth and eutrophication. |
| | Total Organic Carbon (TOC) | These originate from constituents of decomposed, eroded plant and animal waste. Health hazards associated with TOC. |
| | | |
| Pathogens (Micro-organisms) | Bacteria | These usually take the form of fecal streptococci which suggests possible pollution by animals especially when related to fecal coliform and can be a health hazard to humans. |
| | Protozoa | *Giardia* and *Cryptosporidium* originate from animal excrement, particularly calves under 5 months of age. These protozoa can be a health hazard to humans. |

The major way the contaminates listed Table 3-11 enter water bodies is primarily through the following mechanisms: 1) reduction in plant cover which reduces the ability to filter out pollutants, hold soil particles in place, and provide stream shading; 2) direct and indirect soil detachment; 3) erosion and transport by runoff; and 4) animal defecation and urination directly into open water. The potential level of pollution can be summarized as a function of: 1) domestic and wild animal population density; 2) coincidence of animal presence relative to the season, intensity and amount of precipitation; and 3) proximity and access of animals to, and the time spent within, water bodies and riparian zones. In addition, cumulative effects may result from the existence of other ground disturbing activities such as roads which may add additional sediment into area streams.

The water quality effects analysis will focus on characterizing how each alternative influences the four factors listed above.

**Alternative 1 – No Grazing**
**Direct, Indirect, and Cumulative Effects**
Since no cattle would be present, levels of pollution would be dependant on wild animal populations, principally elk and deer. These populations are expected to be low, so the risk of detrimental effects to water quality is expected to be low as well. Game trails will still exist and have a potential for small amounts of localized erosion, sediment deposition and bank trampling. Animal grazing may also cause some very localized erosion due to vegetation loss. Riparian vegetation would have time to recover creating more stream shading that could in turn result in some decreased water temperatures. Riparian vegetation within old timber harvest units would also continue to grow and provide stream shading which would likely result in decreased stream temperature, more channel complexity and diversity and greater bank stability.

Nutrients and pathogens will potentially be introduced into local water systems since the source of these can also be other wild animals. Numerous instances of g*iardia* and c*ryptosporidium* have been reported in areas with no grazing, suggesting introduction by other animals (New York State Dept. of Health Fact Sheet). The incidence is expected to be low, due to a lower overall density of animals.

**Alternative 2 – Current Management with Slight Modifications**

**Water Temperature**
**Direct and Indirect Effects**
Livestock grazing in riparian areas has the potential to reduce stream shading through loss of riparian vegetation by trampling and consumption (Bryant 1982, Maloney et. al. 1999, and Roath and Krueger 1982). This loss of stream shading may in turn lead to an increase in stream temperature due to exposure to increased solar radiation. Maloney et. al. (1999) found a statistical relationship between the number of hectares per Animal Unit Months (AUM) and increased stream temperature in a study conducted in eastern Oregon. In general, they found that there was a statistically significant difference in maximum hourly stream temperatures between ungrazed and heavily grazed areas where cattle had access to riparian vegetation.

Utilization data from vegetation plots in the Long Prairie allotment (see Figure 3-7) indicates that under the current management scheme, riparian areas are being intensely grazed with 52 cow/calf pairs or 240 AUMs. Research has indicated that cows start to graze on woody shrubs in riparian areas as the more palatable grasses become inaccessible due to low stubble heights from intense grazing (Hall and Bryant 1995). These shrubs have the potential to provide stream shading in some situations. As mentioned previously, stream temperatures are currently meeting Oregon State water quality standards in West Fork Neal Creek and North Fork Mill Creek within the allotment boundary. It is expected that this situation will continue with current management. If however, the Forest Service re-issues a permit for the additional 53 cow/calf pairs (the permit that is authorized but currently inactive) additional grazing and riparian vegetation loss would result since all of these animals would have unfettered access to all riparian areas with perennial stream flow. In addition, dispersal measures such as salt mineral blocks, alternative water sources, turnout and corral locations away from riparian areas are not currently being used in any great amounts. This will result in additional damage in areas such as Upper West Fork Neal Creek and Upper North Fork Mill Creek.

It is anticipated that the addition of 53 cow/calf pairs for a total of 485 AUMs will result in a small, localized increase in maximum hourly stream temperatures in perennial creeks that are present in pastures grazed in that particular year, based on research by Maloney et. al. The size of this temperature increase is expected to be small due to several factors including the fact that: 1) West Fork Neal Creek currently has a well-developed (albeit narrow) tree component in the riparian area that shades the stream. The trees are big enough that cattle will not browse on them but they will browse on the smaller vegetation directly adjacent to this narrow band of trees; 2) Upper Mill Creek in the Gibson Prairie area is currently an intermittent stream. Although some sections of this stream have the potential to flow for longer periods of time if allowed to recover from effects of cattle grazing and timber harvest (channel incision, riparian vegetation recovery). It is dry during the warmest part of the year right now. The actual amount of stream temperature increase that would result from 485 AUMs is unknown.

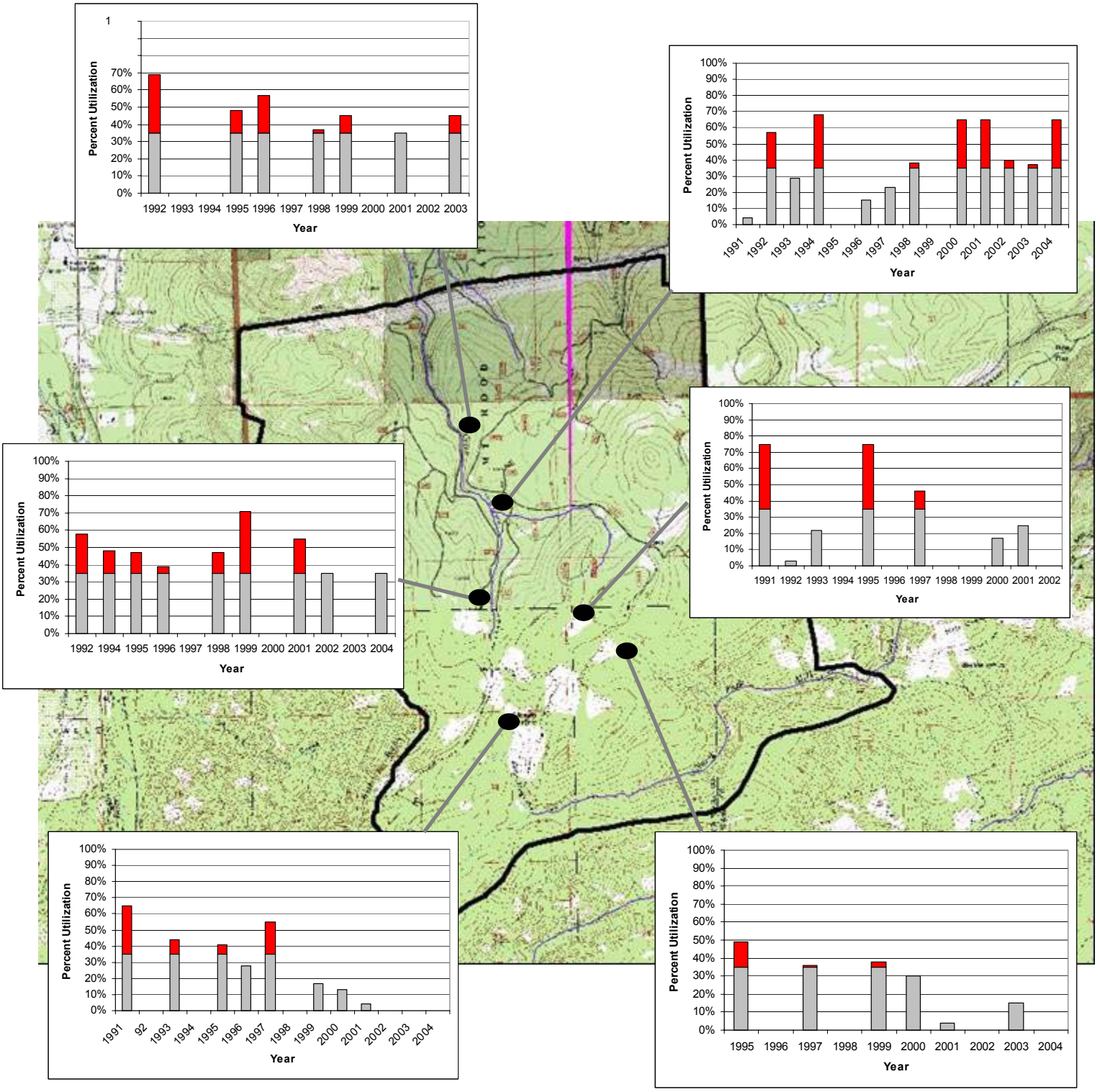


**Figure 3-7. Graphic showing utilization plots for riparian areas in the Long Prairie Allotment.** Graphs show the percent utilization for each year and the location where the plot was taken. Red portions of each bar graph show the amount the plot exceeded the 35% utilization standard defined in the Mt. Hood National Forest Plan. Years with no utilization values are years these sites were rested from grazing.

**Cumulative Effects**
The majority of risk for cumulative effects relating to water temperature increases would result from a combination of grazing and timber harvest activities adjacent to perennial streams in the planning area. Past timber harvest units may have removed streamside trees thus increasing the chance of heating surface water by solar radiation.

As displayed in the existing condition section, an analysis of the percentage of riparain reserves that have been removed by timber harvest on National Forest System land was completed and is displayed in the table below. This gives a general idea about the current condition of the riparian area.

| Table 3-12. Harvest of Riparian Reserves | |
|---|---|
| Sub-watershed | % Riparian Reserve Harvested |
| West Fork Neal Creek | 4% |
| Mosier Creek | 0% |
| North Fork Mill Creek | 20% |
| | |

North Fork Mill Creek has a riparian reserve harvest level of 20% which indicates it has the highest risk of cumulative effects for stream temperature. The other 7$^{th}$ field- watersheds have a very low harvest level. Since riparian vegetation in these harvest units is recovering every year and providing additional stream shading, it is expected that this will offset any small increase in maximum hourly stream temperatures that may result from grazing with time.

**Sediment**
**Direct and Indirect Effects**
As described in Table 3-11 above, soil erosion from animal activity can mobilize microbes, nutrients and toxic chemicals that are stored in the soil. Fine sediment can also degrade aquatic habitat by filling in gravels and pools in adjacent streams. Research indicates that as grazing intensity increases, the amount of vegetative cover declines (Blackburn et. al. 1982). In addition, soil stability decreases and soil bulk density increases with increased grazing (Heitschmidt 1990). As this vegetation cover is lost, soil is exposed to rainfall and overland flow that in turn can increase the chance of erosion. Loss of vegetation can also lead to loss of sediment traps that hold and store eroded material away from surface water. In a two-year study by Warren, et al. (1986), it was found that the pastures that were grazed at the highest stock density produced the lowest infiltration rates and greatest sediment loss. Sediment production under heavy, rotational grazing can average nearly twice that of moderate, continuous grazing on clay and clay loam soils (Pluhar, et al. 1987).

The traditional way of characterizing population density for grazing is to define it in terms of light, moderate, and heavy grazing intensity. Research has attempted to classify intensity in terms of actual measurable values. Trimble and Mendel (1995) complied 18 studies that dealt with grazing intensity, and used these studies to calculate an average value for light, moderate

and heavy grazing intensity based on AUMs per hectare. The values have been converted to AUM/acre and are displayed in the table below.

| Table 3-13. Grazing Intensity | |
|---|---|
| **Grazing Intensity** | **Animal Unit Months (AUM)/Acre** |
| Light | 0.26 |
| Moderate | 0.50 |
| Heavy | 1.04 |

Grazing intensity for each of the three pastures proposed for this alternative is displayed in the table below. One column represents the current number of animals being grazed in the allotment (240 AUM) and the other column represents the maximum potential number of animals (485 AUM) as identified in the existing permit. One of the assumptions for this calculation is that all of the cows would be located in one pasture at one time.

| Table 3-14. Grazing Intensity by Pasture | | | |
|---|---|---|---|
| **Pasture Name** | **Grazing Intensity** | **Animal Unit Months/Acre 240 AUM** | **Animal Unit Months/Acre 485 AUM** |
| Long Prairie | Light - Moderate | 0.25 | 0.51 |
| Surveyor's Ridge | Light | 0.12 | 0.24 |
| Gibson Prairie | Light | 0.08 | 0.16 |

This intensity rating above should only be used as a general assessment since other conditions such as cattle distribution, soil and vegetation types also influence the amount of grazing damage that can occur. The soils section includes a discussion on effects to the soil resource and the grazing section includes a discussion on effects to the vegetation.

Another factor that influences the potential for pollution from grazing activities is the coincidence of animal presence during times of higher precipitation and the general amount of yearly precipitation. Concentrated use by livestock on wet soils causes additional compaction and creates mud that can be washed into surrounding streams. In general, the more precipitation that occurs in an area the more chance that soil particles can be detached and transported to surrounding surface water. The graph below displays average monthly precipitation amounts for the weather station at Parkdale, Oregon which is approximately 6 miles west of the allotment area. The graph represents almost 30 years worth of data that has been collected at this site.

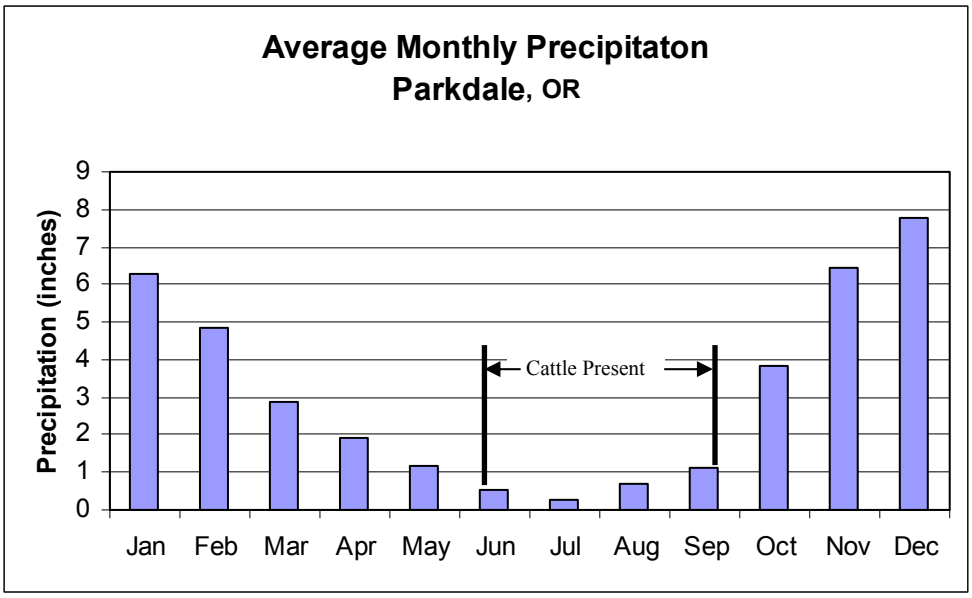


**Figure 3-8. Graph showing average monthly precipitation for the years 1961 through 1990.**

As displayed in the graph above, cattle will be present in the allotment during the driest time of the year. In addition, the allotment is located east of the precipitation station so it receives less total precipitation than the Parkdale station. The fact that the cattle are present during the driest time of the year and that the area in general has a lower, yearly precipitation amount indicates that indirect erosion and sedimentation resulting from precipitation will be low.

The third factor that influences the potential for water pollution from livestock grazing is the proximity and access of animals to, and the time spent within, water bodies and riparian zones. Cattle activity can trample stream banks, adding sediment directly into streams. This additional sediment can encourage channel widening and additional bank erosion in downstream areas in severe cases. As described in the stream temperature section, cattle currently have access to almost all riparian areas within the allotment. This includes approximately 540 acres of riparian reserves along perennial streams. Field surveys by Forest Service Personnel including utilization plots and general observations indicate the cows currently spend considerable time in the riparian areas and are causing damage in the form of excess riparian vegetation consumption, bank trampling and secondary channel incision. This damage is most evident in upper Neal Creek and upper North Fork Mill Creek in Long Prairie and Gibson Prairie areas.

It is expected that bank and channel damage described in the current condition section will continue with the same intensity and duration with 52 cow/calf pairs. If the number of cattle increases to 105 pairs, this will result in an increase of bank trampling, riparian vegetation consumption and channel incision which will in turn, increase the amount of fine sediment introduced into West Fork Neal Creek and North Fork Mill Creek. The specific amount of increased sediment is unknown due to variability in resource and environmental conditions, but since the existing cattle prefer to spend considerable time in the riparian areas, it is a valid assumption that the additional cows would exhibit similar preferences.

*Summary for Sediment*
The following table summarizes the three factors discussed above. The "Riparian Area Use" rating in the table below is a qualitative assessment of the amount of anticipated use based on documented use described in the current condition section with the addition of any pertinent mitigation measures.

**Table 3-15. Summary Table for Sediment Effects**

| | 52 Cow/Calf Pair | 105 Cow/Calf Pair |
|---|---|---|
| General Grazing Intensity | Light | Light-Moderate |
| Use During Wet Periods | Low to None | Low to None |
| Riparian Area Use in Upper West Fork Neal and Upper North Fork Mill Creeks | Moderate-High | High |
| Overall Trend of Aquatic Resource Related to Sediment | Maintain the Current Conditions → | Degrade the Current Conditions ↓ |
| | | |

As discussed in the previous section, the major contributor of sediment by grazing activities is the proximity and access of animals to, and the time spent within, water bodies and riparian zones during drinking, feeding and loafing. It is anticipated that the increase of 53 cow/calf pairs will directly result in additional animals spending time in the riparian areas causing fine sediment introduction by bank trampling, riparian vegetation consumption and channel incision.

**Cumulative Effects**
One of the major sources of fine sediment in watersheds can be roads. Road surface, cut and fill slopes expose bare soil to potential erosion and ultimately sedimentation in some cases. As described in the current condition section road density can be used as a measure of potential sediment concerns associated with roads. Watersheds with higher road densities may have problems with introduction of fine sediment into the aquatic system. Road density in West Fork Neal Creek is approximately 4 $mi/mi^2$ which suggests a potential for higher levels of fine sediment due to roads (see footnote, page 54). This coupled with sediment derived from cattle activity in and around riparian areas in West Fork Neal Creek has the potential for cumulative effects. As noted earlier, a high percentage of fine substrate material was identified in two stream surveys on the lower eight miles of the West Fork Neal Creek. This could be due at least in part to fine sediment derived from current grazing activity and roads. Increasing the number of cows to 485 AUMs (105 cow/calf pairs) would increase fine sediment input into this stream system, increasing the potential for additional cumulative effects.

**Nutrients and Pathogens**
**Direct and Indirect Effects**
As described in Table 3-11 at the beginning of this section, introduction of nutrients and pathogens may occur as a result of transport from animal waste. The potential for problems is a function of timing, total livestock density and livestock access. This is most important in high use areas such as where animals congregate for water, feed and shade. Nutrients and pathogens can be introduced to surface water either on eroded soil particles or directly by livestock in and around water sources. Research has shown that fecal coliform is highest with heaviest grazing, intermediate under moderate grazing and lowest with no grazing (Tiedemann 1987). Although

general grazing intensity is a factor, levels of fecal coliform in streams tend to be more closely related to livestock use in or adjacent to surface water and not general stocking rates. Swanson (1994) found that bacterial loads are reduced 95% only 7 feet from a feces deposit. In soil, fecal coliform and fecal streptococci survival varies with environmental conditions from two or three days in the summer to more than 20 days in the winter. Doyle, et al (1975) found no significant movement of fecal coliform and fecal streptococci or nitrogen or phosphorus further than 12.3 feet from source manure. Buckhouse and Gifford (1976) found that only the fecal patch and surrounding 1 meter radius were subject to bacterial pollution and suggested that "unless feces are deposited in or adjacent to a streambed, there is little danger of significant bacterial contamination."

Grazing intensity, timing of grazing, and ability for livestock to access surface water in the allotment are all discussed in detail in the sediment section. Based on the research referenced above, the largest risk to water quality is introduction of nutrients and pathogens by livestock use in and around surface water. This is supported by the fact that livestock currently have access to all surface water in the allotment except one meadow. The existence of these contaminants on National Forest System land is not known due to lack of sampling, but it should be noted that neither the North Fork Mill Creek nor the West Fork Neal Creek watersheds are listed in the 2002 State of Oregon 303(d) list of water quality limited streams for nutrients or pathogens. The following table summarizes those findings that are also applicable in determining potential nutrient and pathogen effects.

**Table 3-16. Summary Table for Nutrient and Pathogen Effects**

| | 52 Cow/Calf Pairs | 105 Cow/Calf Pairs |
|---|---|---|
| General Grazing Intensity | Light | Light-Moderate |
| Use During Wet Periods | Low to None | Low to None |
| Riparian Area Use in Upper West Fork Neal and Upper North Fork Mill Creeks | Moderate-High | High |
| Overall Trend of Aquatic Resource Related to Nutrients and Pathogens | Maintain the Current Conditions → | Degrade the Current Conditions ↓ |

As discussed above, the major contributor of nutrients and pathogens by grazing activities is the proximity and access of animals to, and the time spent within, water bodies and riparian zones during drinking, feeding and loafing. It is anticipated that the increase of 53 cow/calf pairs would directly result in additional animals spending time in the riparian areas increasing the potential for detrimental effects related to nutrients and pathogens. The exact amount of this increase is unknown.

**Cumulative Effects**

Other potential sources of nutrients or pathogens in the area are other mammals and any fertilization that might be occurring on cropland well downstream of the allotment. The nearest agricultural land is approximately 7 miles downstream of the allotment boundary on West Fork Neal Creek. In addition, no sections of any of the streams that exit the allotment are listed on the

State of Oregon 303 (d) list for any nutrients or pathogens, indicating a potential lack of concern associated with the parameters.

**Alternative 3 – Proposed Action**

**Water Temperature**
**Direct and Indirect Effects**
This alternative allows continuation of 240 AUMs in the allotment but includes a number of mitigation measures to protect riparian vegetation in West Fork Neal Creek and North Fork Mill Creek. A new fence in the southern portion of the allotment would keep cattle out of most of North Fork Mill Creek, also allowing streamside vegetation to grow and eventually shade the stream. Riparian areas along North Fork Mill Creek that are outside the fence would have placement of wood called "knee knockers" that would discourage animal movement to the stream channel and adjacent riparian area.

In addition to the fences, several measures will be employed to encourage better dispersion of cattle away from riparian areas. These include turn-out locations other than the Long Prairie corral, salt mineral blocks away from riparian areas and the development of an additional water source. Bailey and Welling (1999) showed that cattle spent more time and grazed more forage in pasture areas where low-moisture supplement was provided than in similar control areas where no supplement was provided. In an Oregon study, Miner et al. (1992) observed that cows spent an average of 25.6 minutes/day in the stream if it was the only source of water. However, if an off-stream tank was made available, cows spent only 1.6 minutes/day in the stream. Utilizing these dispersion measures would provide additional benefit to riparian areas within the allotment.

Implementation of this alternative would allow riparian vegetation to further recover, thus increasing shade and slightly decreasing maximum hourly stream temperatures. It is expected that West Fork Neal Creek and North Fork Mill Creek would continue to meet Oregon State water quality standards for stream temperature. This alternative would allow an incremental increase of cattle up to a maximum of 485 AUMs if resource conditions allow. A discussion of monitoring to define conditions that may allow additional animals is discussed in detail in the adaptive management section of this document. The additional cattle would not be introduced if riparian and channel areas are not showing a recovery trend. If additional cattle are introduced and the riparian area and channel conditions deteriorate, these cattle will be removed.

**Cumulative Effects**
A new corral configuration is being planned as part of another NEPA decision. This corral configuration would be implemented in September 2005 and would keep cattle out of the upper West Fork Neal Creek channel and riparian area. This new corral and water source inside the corral would allow riparian vegetation next to West Fork Neal to recover and provide some secondary shading of the creek. Riparian vegetation recovery in heavily grazed areas adjacent to West Fork Neal and North Fork Mill Creeks, coupled with vegetation recovery in the old timber harvest units described in the current condition section should result in reduced maximum hourly stream temperatures. This reduction should be very small due to conditions described in the Alternative 2 analysis.

**Sediment**

**Direct and Indirect Effects**

As described in the discussion of Alternative 2, grazing intensity, use during wet periods, and accessibility of animals to streams and adjacent riparian areas are important factors in determining potential pollution from cattle grazing. Since this alternative proposes to allow the same number of animals to graze for the same period of time, the first two factors will remain the same in this alternative. Additional riparian fencing and encouragement of animals to use areas other than riparian areas will result in reduced bank trampling and sediment introduction into West Fork Neal Creek and North Fork Mill Creek.

Recovery of riparian vegetation in general, will provide additional protection to buffer any surface erosion that might occur adjacent to riparian areas. The graph below shows the number of acres of Riparian Reserves along perennial streams that cattle have access to for the different planning alternatives.

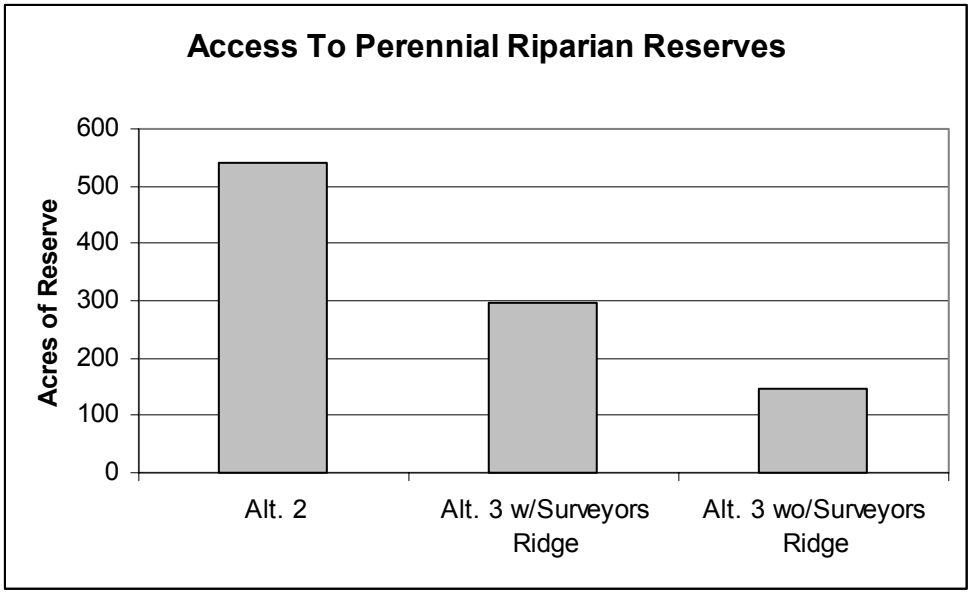


**Figure 3-9. Graph showing the number of acres of Riparian Reserve along perennial streams that cattle have direct access to under each planning alternative.**

The reduction of the number of acres is the result of riparian fencing projects.

*Summary for Sediment*

The following table summarizes the three factors discussed above.

**Table 3-17. Summary Table for Sediment Effects**

| | 52 Cow/Calf Pairs | Up to 105 Cow/Calf Pairs |
|---|---|---|
| General Grazing Intensity | Light | Light-Moderate |
| Use During Wet Periods | Low to None | Low to None |
| Riparian Area Use in Upper West Fork Neal and Upper North Fork Mill Creeks | Low to Moderate | Low to Moderate |
| Overall Trend of Aquatic Resource Related to Sediment | Improve Current Conditions ↑ | Improve Current Conditions ↑ |

As previously discussed, the major contributor of sediment by grazing activities is the proximity and access of animals to, and the time spent within, water bodies and riparian zones during drinking, feeding and loafing. It is anticipated that implementation of additional riparian fencing and measures to encourage use outside riparian areas sedimentation from grazing activities will be greatly reduced from the current levels.

**Cumulative Effects**

The greatest reduction of sediment will occur in the Long Prairie area of West Fork Neal Creek. Damage to streambanks, riparian areas and sediment introduction are all documented in the current condition section. With the new corral configuration proposed as part of another NEPA decision, access to this section of the creek will be eliminated.

One of the major sources of fine sediment in watersheds can be roads. Road surface, cut and fill slopes expose bare soil to potential erosion and ultimately sedimentation in some cases. As described in the Current Condition section road density can be used as a measure of potential sediment concerns associated with roads. Watersheds with higher road densities may have problems with introduction of fine sediment into the aquatic system. Road density in West Fork Neal Creek is approximately 4 $mi/mi^2$ which suggests a potential for higher levels of fine sediment due to roads (see footnote, page 54). Since sediment production from grazing is expected to decrease compared to the current condition, the risk of cumulative effects is also expected to be lower as well.

**Nutrients and Pathogens**

**Direct and Indirect Effects**

As described above, introduction of nutrients and pathogens may occur as a result of transport from animal waste. The potential for problems is a function of timing, total livestock density and livestock access. Although general grazing intensity is a factor, levels of fecal coliform in streams tend to be more closely related to livestock use in or adjacent to surface water and not general stocking rates.

Grazing intensity, timing of grazing and ability for livestock to access surface water in the allotment are all discussed in detail in the sediment section above. Based on the research referenced in Alternative 2, the largest risk is introduction of nutrients and pathogens by livestock use in and around surface water. The following table summarizes those findings which are also applicable in determining potential nutrient and pathogen effects.

**Table 3-18. Summary Table for Nutrient and Pathogen Effects**

| | 52 Cow/Calf Pairs | Up to 105 Cow Calf Pairs |
|---|---|---|
| General Grazing Intensity | Light | Light-Moderate |
| Use During Wet Periods | Low to None | Low to None |
| Riparian Area Use in Upper West Fork Neal and Upper North Fork Mill Creeks | Low to Moderate | Low to Moderate |
| Overall Trend of Aquatic Resource Related to Nutrients and Pathogens | Improve Current Conditions ↑ | Improve Current Conditions ↑ |

As previously discussed, the major contributor of nutrients and pathogens by grazing activities is the proximity and access of animals to, and the time spent within, water bodies and riparian zones. It is anticipated that implementation of additional riparian fencing and measures to encourage use outside riparian areas introduction of these pollutants from grazing activities will be greatly reduced from the current levels.

**Cumulative Effects**
Other potential sources of nutrients or pathogens in the area are other mammals and any fertilization that might be occurring on cropland well downstream of the allotment. The nearest agricultural land is approximately seven miles downstream of the allotment boundary on West Fork Neal Creek. Nutrients such as nitrogen and phosphorus become problems when amounts become excess to what the existing vegetation can handle. Since travel down to the nearest next major source includes movement through many miles of a vegetated riparian area, it is doubtful that excess nutrients would result. In addition, no sections of any of the streams that exit the allotment are listed on the State of Oregon 303 (d) list for any nutrients or pathogens, indicating a potential lack of concern associated with the parameters.

**Consistency with the Clean Water Act**
The Clean Water Act encompasses all of the water quality standards discussed above. Current management of the allotment is currently meeting water quality standards, although there is a greater risk that standards could be compromised in the long term if no range improvements were to be put into place across the allotment over time and/or the existing waived permit were to be reissued with no change to range management. In the proposed action there is much less risk to water quality with the proposed range improvements and the standard under the adaptive management approach that more livestock would not be added to the allotment unless riparian objectives are met and the area shows a long-term recovery trend.

# Aquatic Species and Associated Habitat

## Existing Condition

An aquatic Biological Assessment was completed as part of this analysis and for consultation purposes. The entire Biological Assessment is incorporated by reference and is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the assessment are summarized below.

**Watershed Description**
The headwaters of seven streams are within the boundaries of the Long Prairie grazing allotment. Neal Creek, West Fork Neal Creek, North Fork Mill Creek, and Mosier Creek, all 7$^{th}$ field watersheds, originate from springs within the allotment. Only West Fork Neal Creek and North Fork Mill Creek are fish-bearing (resident rainbow and cutthroat trout) within the allotment.

For the purpose of this assessment, West Fork Neal Creek and Neal Creek from its confluence with West Fork Neal Creek upstream to its headwaters were each assessed at the 7$^{th}$ field scale (both creeks are within the Neal Creek 6$^{th}$ field watershed-see Figure 3-2). North Fork Mill Creek was also assessed at the 7$^{th}$ field scale from the eastern allotment boundary upstream to its headwaters (the creek is within the North-South Forks Mill Creek 6$^{th}$ field watershed).

No fish species listed as threatened or endangered are known to be present in streams within the allotment boundaries. However, Lower Columbia River steelhead trout (O*ncorhynchus mykiss*) with presence in Neal Creek and West Fork Neal Creek, and Middle Columbia River steelhead trout with presence in Mill, North Fork Mill, and South Fork Mill Creeks are both listed as threatened species and are present downstream of the allotment boundary.

**Management Indicator Species**

Cutthroat trout (*O. clarki*), likely the coastal variety, and resident rainbow trout (*O. mykiss*), both Management Indicator Species (MIS) under the Mt. Hood National Forest Land and Resource Management Plan (1990), are present in all three creeks. Cutthroat trout are known to be present in West Fork Neal and North Fork Mill Creeks to their headwaters, and their presence is suspected in Neal Creek to just below the allotment boundary. Rainbow trout presence is known in West Fork Neal and Neal Creeks below the allotment boundary, and suspected in North Fork Mill Creek up to the allotment boundary. The resident rainbow trout in North Fork Mill Creek are suspected to be the redband subspecies, which is a Forest Service, Pacific Northwest Region sensitive species. Detailed descriptions of fish distribution relative to the allotment boundary follow.

**Definitions of terms used to describe fish presence**

The terms “known,” “potential,” and “suspected” are used to describe fish distribution in this document. Known presence describes areas where a species has been documented. Areas of known presence could also be defined as occupied habitat. Potential presence describes areas where a species has not been documented, but these areas are accessible to fish if conditions allow (during high spring flows, for example). Suspected presence describes areas where a species has not been documented, but the District fisheries biologist has reason to believe they are present, based on the occurrence of accessible suitable habitat.

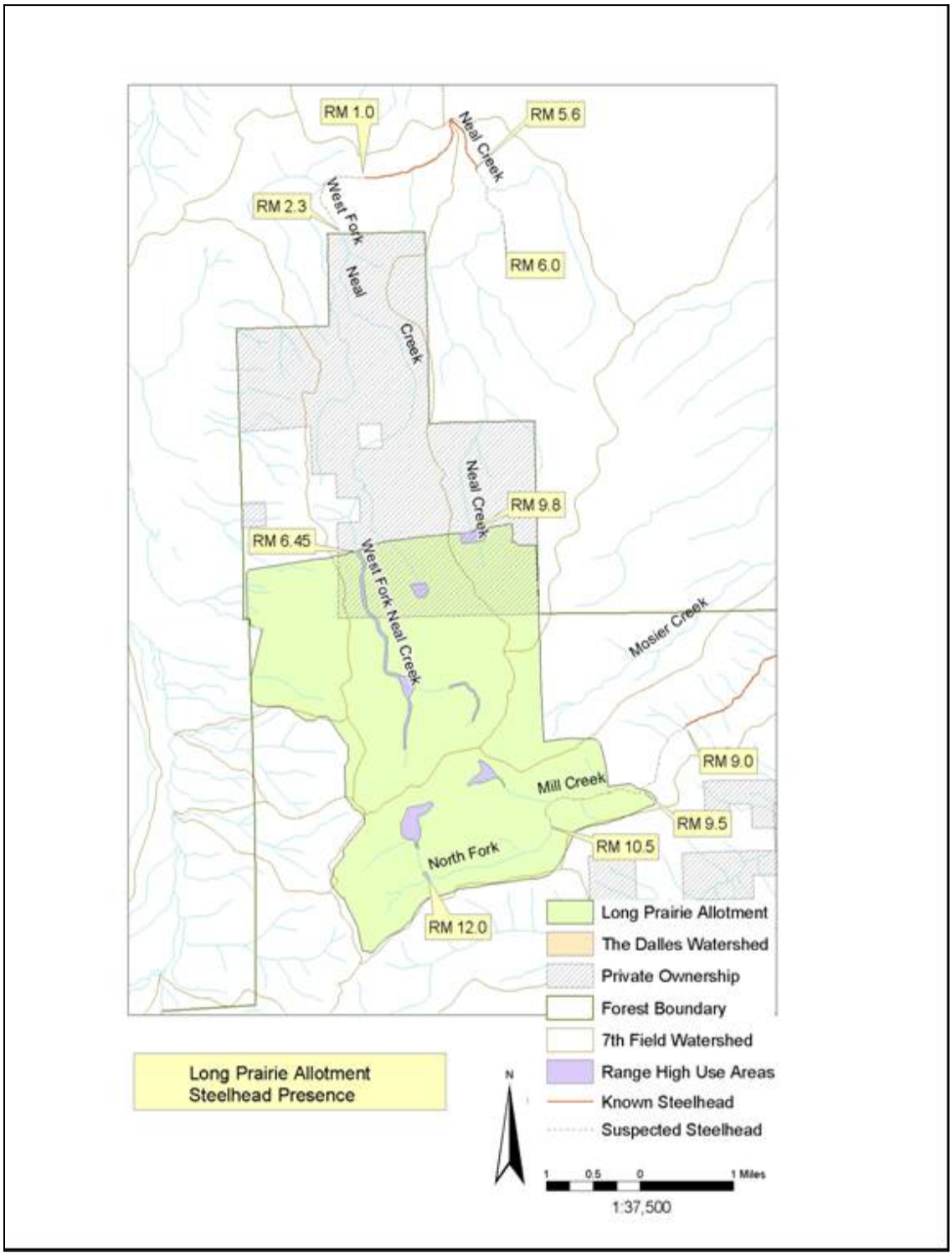


**Figure 3-10. Known, potential, and suspected distribution of steelhead trout within Neal Creek, West Fork Neal Creek, and North Fork Mill Creek in relation to the Long Prairie Allotment.** **Range or livestock high use areas are those areas where cattle tend to congregate based on monitoring data and observations from the Range Conservationist.**

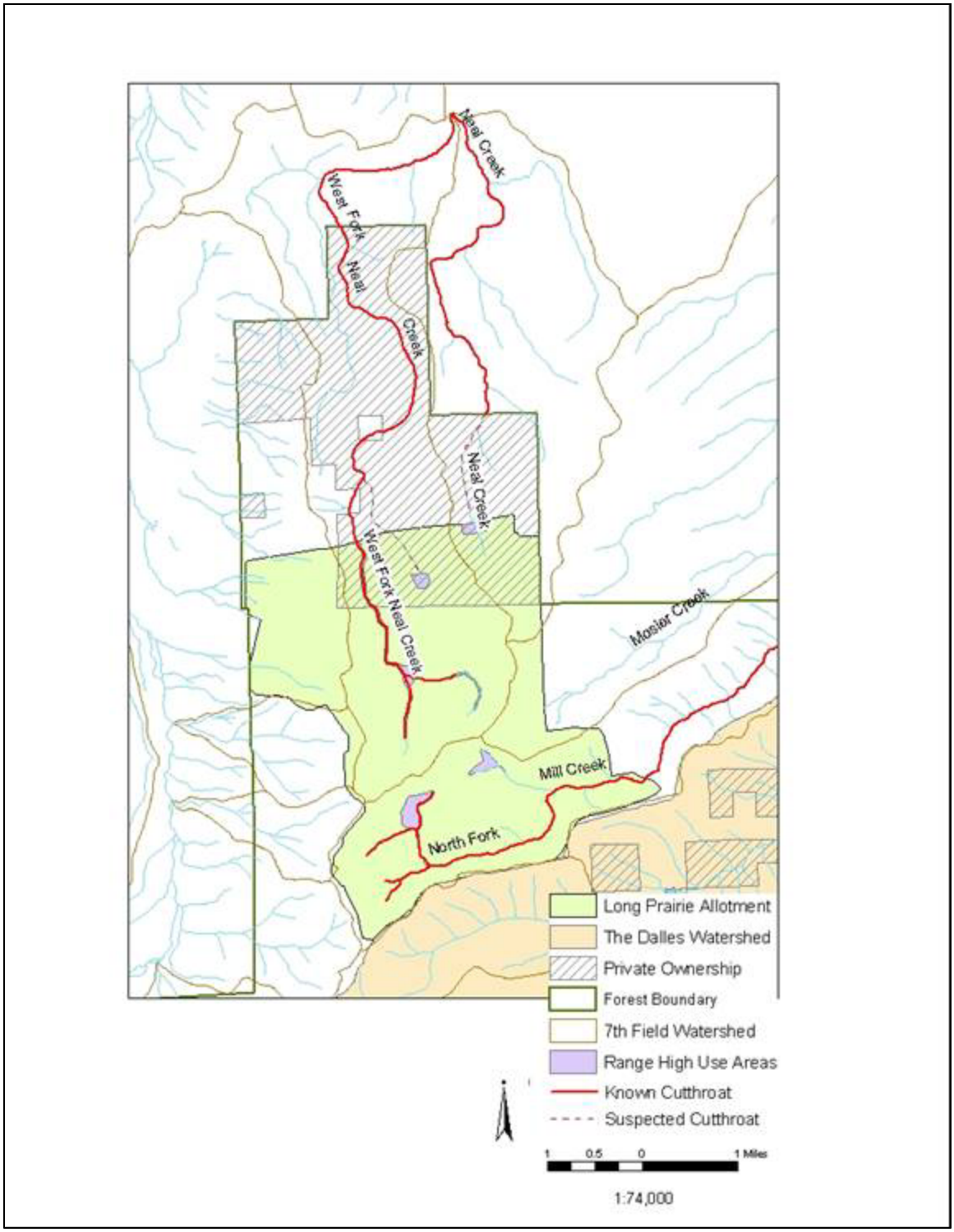


**Figure 3-11. Known and suspected distribution of cutthroat trout within Neal Creek, West Fork Neal Creek, and North Fork Mill Creek in relation to the Long Prairie Allotment.**

Range or livestock high use areas are those areas where cattle tend to congregate based on monitoring data and observations from the Range Conservationist.

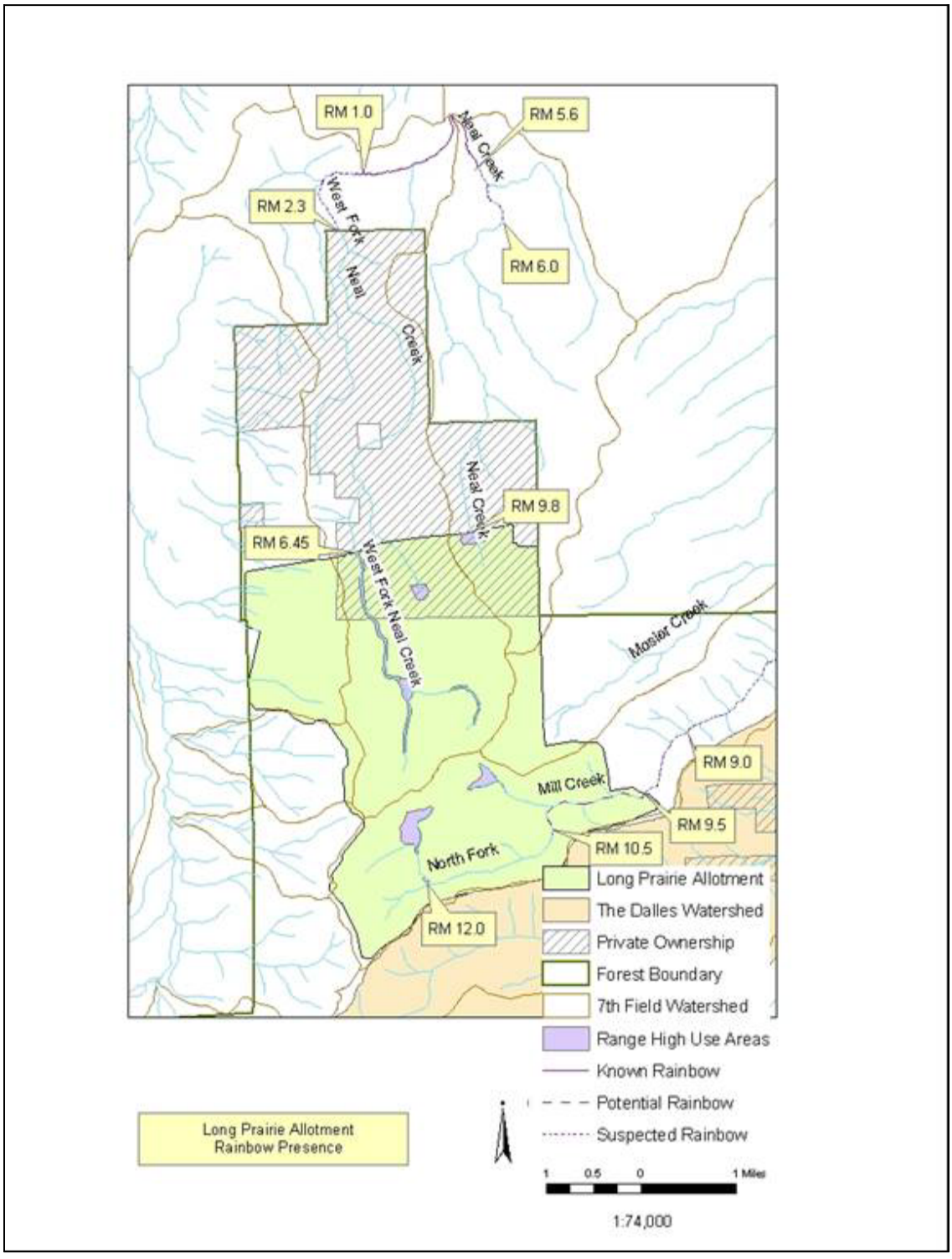


**Figure 3-12. Known, potential, and suspected distribution of resident rainbow trout within Neal Creek, West Fork Neal Creek, and North Fork Mill Creek in relation to the Long Prairie Allotment.**

Range or livestock high use areas are those areas where cattle tend to congregate based on monitoring data and observations from the Range Conservationist.

**Aquatic Species not addressed in this Document**
**Bull Trout**
There are no historic or current observations of Columbia River bull trout (S*alvelinus confluentus*) in Neal Creek or West Fork Neal Creek (Buchanan et al., 1997). Bull trout have never been documented in Mosier Creek or North Fork Mill Creek (Jennifer Clark, Wasco County Soil and Water Conservation District, personal communication). Water temperatures are likely too high to support bull trout in any of these streams. Also, there is no designated bull trout critical habitat in any of these streams. As such, activities in the allotment will have no effect on bull trout and they will not be discussed further.

**Coho Salmon**
*Neal Creek*
Coho salmon are a proposed species for listing as threatened or endangered and are known to occur in Neal Creek. Coho have never been documented above the confluence with West Fork Neal Creek and are not believed to ascend past the confluence. The indigenous run of coho in the Hood River Watershed may be extinct and the coho currently present are considered hatchery strays by Oregon Department of Fish and Wildlife (ODFW) (BPA, 1996; Rod French, ODFW, personal communication).

*Mill Creek*
Coho salmon are known to occur in Mill Creek but they have never been documented above the confluence of North and South Forks Mill Creek, a distance of approximately 10 river miles downstream of the allotment boundary (Jennifer Clark, Wasco County Soil and Water Conservation District, personal communication).

Thus, activities in the allotment will have no effect on coho salmon in either Neal Creek or Mill Creek and they will not be discussed further.

**Detailed Discussion of Fish Distribution**
See fish distribution maps (Figures 3-10, 3-11, and 3-12) for a summary of pertinent information for fish distribution and stream reaches relative to the Long Prairie Allotment boundary.

***Neal Creek***
Steelhead trout in Neal Creek (and West Fork Neal Creek) are within the Lower Columbia Evolutionarily Significant Unit (ESU) and are listed as threatened. Steelhead have been documented in Neal Creek a half mile above its confluence with West Fork Neal Creek, where a culvert that was a probable barrier used to exist. There are no known or suspected barriers to fish passage in Neal Creek above this point, but the steep gradient of the stream may preclude anadromy. Anadromous fish, for example salmon and steelhead, are those that are born in fresh water, migrate as juvenile fish to the ocean, feed and grow in the ocean for several years, then migrate back to their natal freshwater stream to spawn. Based on a field visit March 17, 2003, it is the professional judgment of Forest Service fish biologists that steelhead are unlikely to ascend the steep, cascading section of Neal Creek that begins at approximately river mile 6.0 (the confluence with West Fork Neal Creek is at river mile 5.1). This point appears to be at or near the upper limit of steelhead and rainbow trout distribution in Neal Creek. It is believed that

steelhead spawn in Neal Creek no higher than one mile upstream of the West Fork Neal Creek mouth (Steve Pribyl, ODFW, personal communication).

Oregon Department of Fish and Wildlife stream survey personnel noted "trout fry (steelhead?)" throughout their survey of Neal Creek from its confluence with West Fork Neal Creek at river mile 5.1 to river mile 8.8 – the Mt. Hood National Forest boundary before the land exchange (ODFW, 1993). These "trout fry" were probably cutthroat trout which are present to at least river mile 8.8, where an impassable culvert exists (Steve Pribyl, ODFW, personal communication). Genetic analysis of fish in the mainstem of Neal Creek below the confluence with West Fork Neal Creek indicates coastal rainbow trout only (Kostow, 1994). ODFW personnel found both juvenile and adult "rainbow/steelhead" in Neal Creek at river mile 1.5 and at river mile 5.0, and found adult cutthroat trout at river mile 5.0 as well (Olsen et al., 1995). It appears cutthroat are present primarily in the headwaters of Neal Creek.

Based on the information available, the upper limits of steelhead distribution and suspected habitat are to the steep gradient reach beginning at ~river mile 6.0 in Neal Creek.

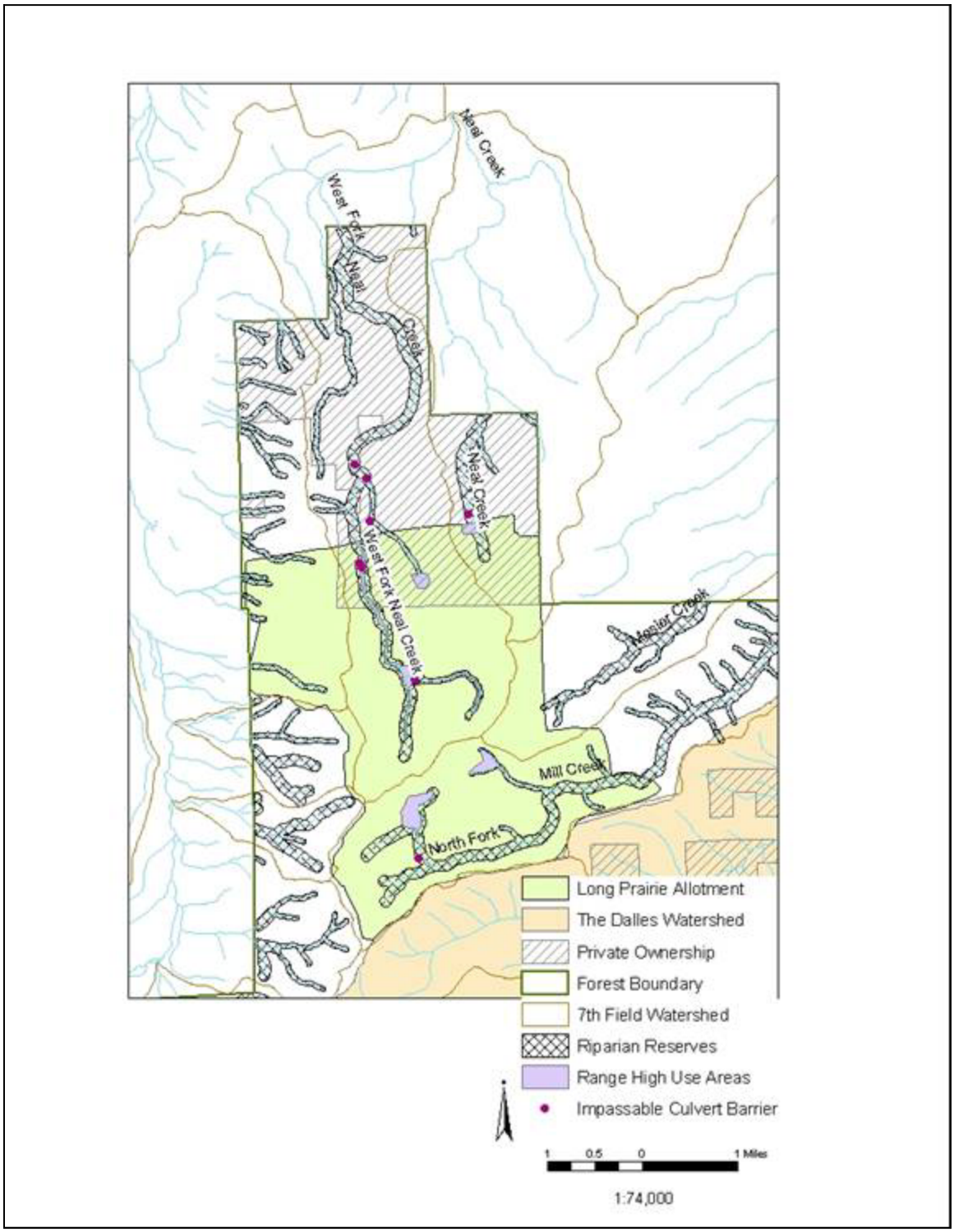


**Figure 3-13. Known culvert barriers and riparian reserves within Neal Creek, West Fork Neal Creek, and North Fork Mill Creek in the Long Prairie Allotment.**

Range or livestock high use areas are those areas where cattle tend to congregate based on monitoring data and observations from the Range Conservationist.

**West Fork Neal Creek**
Salmonids known to be present in West Fork Neal Creek include resident coastal rainbow, steelhead, cutthroat, and a naturalized population of brook trout (*S. fontinalis)*. Steelhead are known to spawn below the old Mt. Hood National Forest boundary within the first mile of West Fork Neal Creek (Holly Coccoli, Hood River Watershed Group, personal communication), but adult steelhead have never been documented within the Mt. Hood National Forest. Steelhead are unlikely to ascend as far upstream as the old forest boundary (river mile 2.3) in West Fork Neal Creek due to natural gradient barriers below the forest boundary, small size, and a lack of suitable spawning habitat (Steve Pribyl, ODFW, personal communication). This distribution of steelhead spawning and rearing habitat is corroborated by StreamNet (a cooperative information management and dissemination project focused on fisheries and aquatic-related data in the Columbia River basin and the Pacific Northwest) which lists the upper limit as river mile 2.52 (StreamNet, 2005). There are also six culverts that are upstream migration barriers; the lowest located at approximately river mile 5.5 (USFS, 2000).

Based on the information available, the upper limits of steelhead distribution and suspected habitat in West Fork Neal Creek is river mile 2.3.

Forest Service personnel discovered cutthroat trout during electroshocking surveys in West Fork Neal Creek from the new forest boundary to the headwater forks (Mt. Hood National Forest, unpublished data). Stream surveyors observed salmonids, likely cutthroat trout, throughout their survey from river mile 2.3 (the old forest boundary) to the headwaters at river mile 8.8, and they appeared to be more abundant above a section of dry channel located between river mile 5.9 and 6.4 (USFS, 1999). Fish studies to date have not definitively genetically identified whether trout found in the headwaters are cutthroat or rainbows. The fish observed in the headwaters morphologically appear to be cutthroat, but there could be rainbows in the population. For this analysis, fish in the headwaters are assumed to be cutthroat and rainbow distribution is assumed to be the same as steelhead.

Interbreeding of resident and anadromous rainbow trout is possible in West Fork Neal Creek below culvert barriers, but is very unlikely upstream from these barriers. This assertion is based not only on the presence of the barriers themselves but also on the professional judgment of several area biologists concerning the low probability of anadromous steelhead ascending this stream to the headwaters.

**North Fork Mill Creek**
Fish present in North Fork Mill Creek include cutthroat trout, resident rainbow trout, and Middle Columbia River ESU steelhead trout. Genetic analysis of salmonids from the mainstem of Mill Creek indicated a mixed population of redband and cutthroat trout immediately below the confluence of the North and South Forks, predominantly redband trout. Progressing downstream, cutthroat trout presence dissipated giving way to a pure redband population. Rainbow trout identified as redband had a high frequency of the redband allele, thus it is assumed they are the inland variety (Spruell et al. 1998, Gregg et al. 1995). Electroshocking surveys indicate cutthroat trout and possibly rainbow trout reside in North Fork Mill Creek from the mouth to the headwater forks (Mt. Hood National Forest, unpublished data). Field staff from the MHNF noted there appeared to be “cutthroat-rainbow hybrids” in the headwater forks (Mt.

Hood National Forest, unpublished data). The presence of cutthroat trout populations above the limits of anadromous fish use is a common pattern of species distribution in watersheds in this area (Steve Pribyl, ODFW, personal communication). It is the professional opinion of the Hood River and Barlow Ranger District zone fisheries biologist that salmonids in North Fork Mill Creek upstream from the forest boundary are predominantly cutthroat trout (Gary Asbridge, USFS, personal communication). Further genetic analysis is warranted to determine the salmonid species observed by surveyors in the headwaters of North Fork Mill Creek. For this analysis, resident rainbow trout distribution is assumed to be identical to steelhead distribution.

Middle Columbia River ESU steelhead trout are found in Mill Creek and South Fork Mill Creek and have been documented by Forest Service district fisheries personnel in North Fork Mill Creek to within 0.5 river mile of the allotment boundary, and their presence is suspected up to the eastern boundary of the allotment at approximately river mile 9.5. The culvert at Forest Service Road 1711-630 (at the eastern boundary of the allotment) was a barrier to fish passage, but was replaced in the summer of 2004 and is now passable. During a walking survey of North Fork Mill Creek in 2004, Mt. Hood National Forest fisheries biologists identified the upper limit of potential steelhead presence to be at approximately river mile 10.5, based on small channel size and the lack of suitable spawning habitat upstream of this point. Cattle do not use the area downstream of the headwaters forks (river mile 12.0) due to steep terrain and heavy timber, thus the closest location of grazing is 3.0 river miles from known steelhead presence.

**Table 3-19. Summary of Fish Distribution and Stream Reach Information**

| | Neal Creek | West Fork Neal Creek | North Fork Mill Creek |
|---|---|---|---|
| Reach of stream within allotment boundary | River Mile 9.80 – 10.30 (headwaters) | River Mile 6.45 – 8.80 (headwaters) | River Mile 9.50 – 12.40 (headwaters) |
| Reach of stream within privately-owned land | River Mile 8.80 – 10.30 (headwaters) | River Mile 2.30 – 7.00 | N/A |
| Location of *old* National Forest boundary | River Mile 8.80 | River Mile 2.30 | River Mile 6.40 |
| Location of *new* National Forest boundary | N/A: Neal Creek is completely outside of the new National Forest boundary | River Mile 7.00 | N/A: The National Forest Boundary has not changed in this area. |
| Upper limit of *known* steelhead presence | River Mile 5.60 | River Mile 1.00 | River Mile 9.00 |
| Upper limit of *suspected* steelhead presence | River Mile 6.00 | River Mile 2.30 | River Mile 9.50<br>Note: Upper limit of *potential* steelhead presence is River Mile 10.50. |

| | | | |
|---|---|---|---|
| Distance from allotment boundary to *known* steelhead presence or occupied habitat downstream | 4.20 miles | 5.45 miles | 0.50 miles<br>Note: Due to proposed fence, heavy timber, and steep terrain, cattle impacts on stream are 3.0 River Miles upstream from where steelhead are known to occur. |
| Distance from allotment boundary to *suspected* steelhead presence downstream | 3.80 miles | 4.15 miles | 0.0 miles (steelhead presence is *suspected* up to the allotment boundary).<br>Note: *Potential* steelhead presence is to river mile 10.5, which is one mile within the allotment boundary and 1.5 River Mile from grazing activity. |
| Entry of East Fork Hood River Irrigation Canal (glacial) | N/A: The canal enters West Fork Neal Creek only | River Mile 1.70 | N/A: The canal enters West Fork Neal Creek only |

**Habitat Conditions**

**Neal Creek**

The Forest Service has not conducted a Level II stream survey on Neal Creek. ODFW conducted a habitat survey of Neal Creek from its mouth to river mile 8.8 (the National Forest boundary prior to 1994) in 1993. There is no data available on habitat conditions in the upper approximately 1.5 miles of Neal Creek, which includes the portion of the creek that is within the boundary of the allotment (river mile 9.8 – 10.3). We assume that habitat conditions in the headwater area within the allotment are similar to the surveyed reaches (the gradient is similar). We also assume that conditions documented in the 1993 ODFW survey still apply, although the 1996 flood could have changed habitat conditions. For the purposes of this assessment, effects to Neal Creek will be analyzed from its confluence with West Fork Neal Creek (river mile 5.1) to its headwaters (river mile 10.3).

Fish habitat conditions in Neal Creek above its confluence with West Fork Neal Creek are fair overall due to limited habitat elements. Habitat in upper Neal Creek is dominated by cascades and rapids. ODFW data on Large Woody Material per mile was not collected in a format that can be compared to the Forest Plan, PIG, or NMFS standards and guidelines for woody debris density, but measurements were made for wood complexity in relation to its influence on fish habitat in the reaches surveyed. Woody debris was found to be absent or in very low abundance, and no habitat complexity or cover was created by the wood. However, data from the 1993 survey indicated that the stream is well shaded (river mile 5.1 – 8.8 had an average of 3.6% open sky). Soon after the 1993-1994 land exchange, cedar groves in wet, swampy areas located at the headwaters of Neal Creek and at the headwaters of an unnamed tributary to West Fork Neal Creek were logged (Dan Fissell, Range Conservationist, USFS, personal communication).

Neal Creek does not meet Forest Plan, PIG, or NMFS standards for pool frequency. Pool numbers are very low overall and there were no pools greater than three feet deep. No pools of any depth were found in the reach from river mile 6.9 -8.8. The ODFW survey also found that an average of 20% of the reach length had banks that were actively eroding. This reach is not within the allotment boundary, so erosion in this area is not due to cattle grazing, but rather to other natural and anthropogenic influences.

Neal Creek is dominated by a cobble substrate (31% average). The reach of Neal Creek upstream from its confluence with West Fork Neal Creek is paralleled by a gravel road from river mile 5.1 –7.4, which may contribute fine sediment to the stream. There are no roads near the creek upstream of river mile 7.4, but the Bonneville power lines cross the creek at approximately river mile 9.8 (at the allotment boundary) within a half –mile of its headwaters.

See the Hydrology section for water temperature summary for Neal Creek.

Neal Creek is altered by human activities throughout its lower reaches. Glacial water from the East Fork Hood River irrigation ditch is introduced into West Fork Neal Creek at river mile 1.7 and into lower Neal Creek at ~river mile 4.0. In addition, the irrigation diversion at river mile 5.0 (just below the confluence with West Fork Neal Creek) was identified as a potential migration barrier for anadromous fish in the Hood River Watershed Assessment (1999). The screen at the diversion can be overtopped by flows in the irrigation canal, thus allowing fish to enter the canal where they most likely perish.

**West Fork Neal Creek**

West Fork Neal Creek is the largest tributary to Neal Creek and its headwaters originate in a wet meadow/spring complex in the Surveyor's Ridge pasture (T. 1S, R. 10E, Sec. 11).

Habitat conditions in West Fork Neal Creek from its confluence with Neal Creek (river mile 0.0) to river mile 2.0 are characterized by a lack of large woody material (LWM) and pool habitat and a relatively large amount of fine substrate. There were no primary pools (pools ≥ 3 feet deep) in the reach, and pool numbers overall were very low (only 25 pools were found in the entire 2.0 river mile survey). Gravel/cobble was the dominant substrate but there was a large percentage of fine substrates: silt, organics, and sand (27%) as well. Actively eroding banks made up 13.3% of the reach's total length (ODFW, 1993). This reach is approximately 4.5 river mile from boundary of the allotment, so bank erosion is not due to cattle grazing on the allotment. Also, it is the professional opinion of the Hood River and Barlow Ranger District zone fisheries biologist that flows in West Fork Neal are not powerful enough to transport sediment from the areas in the headwaters, where bank trampling and associated erosion is occurring, downstream to this location.

From river mile 2.3 – 8.8, fish habitat conditions were similar to those described for the lower two miles of stream. The majority of the wood in the stream was in the small size category. Pool numbers were low (although twice the number found in Reach 1) and only two pools were greater than three feet deep. Similar to the lower 2.0 miles, this reach has a large amount of sand/silt substrate (27%). Trampled dirt banks were identified frequently from river mile 6.45 to 8.8, which is the area of the stream within the allotment. Percent bank instability overall was

7.0% (USFS, 1999). Although it is impossible to determine if all of the erosion and sediment in the headwaters is due solely to cattle grazing (there are deer and elk in the area plus other natural and anthropogenic sediment sources) the frequent observations of cattle in and around the streams as well as the literature indicate at least some of the degradation is due to livestock (see Hydrology Existing Condition).

***North Fork Mill Creek***

North Fork Mill Creek originates in a wet meadow/spring complex in Gibson Prairie (T. 1S, R. 10E, Sec. 14). As in West Fork Neal Creek the headwater portions of stream (above the forks) lie largely within wet meadow complexes.

Compared to West Fork Neal Creek, habitat conditions for most of North Fork Mill Creek, at least within the Mt. Hood National Forest, are better. The amount of pool habitat and LWM was generally higher (North Fork Mill Creek has approximately twice as many pools per mile than West Fork Neal Creek, and also about twice as many pieces of LWM per mile), at least downstream from the headwater meadows. Deep pools were not abundant but also would not be expected given the small size of the stream. Reach 2 (the headwaters) has a large amount of sand/silt substrate (44%).

See the Hydrology section for water temperature summaries for West Fork Neal and North Fork Mill Creeks.

**Sensitive Aquatic Mollusk**

There is one species of sensitive aquatic mollusk (listed on the Forest Service, Pacific Northwest Region Sensitive Species list) that may reside in streams within the allotment. The Columbia duskysnail (L*yogyrus spp*.) lives in small, cold streams. Surveyors in West Fork Neal Creek and nearby Mosier and South Fork Mill Creeks found the Columbia duskysnail. Surveyors in North Fork Mill Creek did not find the Columbia duskysnail, but they only surveyed four sites (two near Gibson Prairie and two near Forest Service Road 1711-630) and it is possible that the snail is present in the watershed due to the similarity of habitat among these three headwater streams. Surveys are not required, but for the purposes of this analysis we are assuming the Columbia duskysnail is present in North Fork Mill Creek until further surveys prove otherwise.

***Field Review***

In summer, cattle seek out riparian areas for shade, forage, and water. Within the allotment, cattle use several stream segments and portions of some of the headwater tributaries throughout the summer. Cattle use of these areas affects resident fish populations and habitat both directly and indirectly. According to Dan Fissell, Range Conservationist, there are several concentrated, high-use areas throughout the allotment where cattle tend to congregate. These areas are all near water but other factors also influence cattle movement including vegetation and terrain (i.e. slope). The cows tend to stay out of steep areas and areas with dense tree stands or large amounts of down wood. The high-use areas are generally more “meadow-like” with gentle terrain. The cattle travel into or through other areas in the allotment but the impacts to streams outside the hotspots are much less. Vegetation utilization monitoring conducted throughout the allotment bears this out, as the utilization in the hotspots is higher than other areas (see the Range Resources and Hydrology sections).

Both West Fork Neal and North Fork Mill Creeks have low channel gradient headwaters and steeper, more confined middle section. Extensive bank trampling and multiple cattle stream crossing trails at the headwaters of both West Fork Neal and North Fork Mill Creeks were documented by Forest Service district fisheries, soil, and hydrology personnel, during and at the conclusion of the 2004 grazing season (see Hydrology section).

During the Mt. Hood National Forest stream surveys of West Fork Neal Creek in 1993 and 1999, it was noted that cattle had access to and were affecting the stream from river mile 6.45 to 8.8 (from the boundary of the allotment upstream to the headwaters) (see Hydrology section).

The Hood River District fisheries biologist who conducted sensitive aquatic mollusk surveys at the West Fork Neal Creek headwaters at Long Prairie on August 7, 1999 noted that there were "very few snails" and that cows were standing in and around the creek. She also noted that the stream banks were disturbed by the cows walking on them, and that there was a large quantity of cow manure in and around the creek.

## Environmental Effects

***Literature Review***

The effects of grazing on riparian and stream environments have been well studied and documented. Riparian vegetation can be changed, reduced, or eliminated by grazing, and riparian areas can be essentially eliminated through channel widening, channel aggrading, or lowering of the water table. Also, cattle are likely to graze more heavily in riparian areas than in upland zones because of the flatter terrain, water, shade, and more succulent vegetation. Salmonid populations are generally reduced in grazed areas where stream channels often contain more fine sediment, stream banks are more unstable, banks are less undercut, and summer water temperatures are higher than in non-grazed areas (Platts, 1991).

Water quality and quantity available to fish can also be affected by grazing. Soil compaction and the subsequent decrease in infiltration rate, coupled with depletion of soil cover caused by grazing, increases water runoff (Platts, 1981). Even if livestock do not directly affect water quality during the grazing season, total dissolved solids, in particular fecal coliform and fecal streptococci, can dramatically increase in streams once fall rains begin (Kauffman and Krueger, 1984). Several studies found average water temperatures dropped when cattle were excluded from streams, and that daily water temperature fluctuations were smaller when cattle were prevented from grazing in and around streams (Kauffman and Krueger, 1984).

Platts (1991) also noted that the effects of land use practices, such as grazing, may be difficult to detect over the long term because annual degradation may be hard to measure, and because "conditions may be poor for so long that they are accepted as natural (p. 394). This may be the case for stream habitat and fish populations within the Long Prairie Allotment because the area has been grazed for almost 100 years. Furthermore, Platts concludes that the accumulated effect of multiple small changes to aquatic systems may be the most detrimental to fisheries because our present methods may not detect subtle changes.

In general, researchers have concluded that livestock grazing degrades stream and riparian habitats, and the habitats improve when grazing is prohibited (Platts, 1991). Platts (1991) found this pattern in 20 of 21 grazing studies he reviewed. Three years after being fenced to exclude livestock, Otto Creek in Nebraska had decreased stream widths, the streambanks stabilized, and summer water temperatures decreased by 2-5°C than before livestock exclusion (Armour, 1977). The stream reaches within the Long Prairie Allotment are generally within forested areas, and thus the effects of grazing on fish and fish habitat may not be as detrimental as in open, meadow areas (trees stabilize the banks and provide shade and cover).

Fish populations can rebound dramatically if grazing activity ceases to exist in their habitat. Kimball and Savage (1977) reported a 425% increase in fish populations in a section of Diamond Fork Creek, Utah, after livestock had been kept away for four years. The increase in fish populations was also attributed to a 60% reduction in forage utilization once grazing was resumed (Platts, 1981).

Under current management of the Long Prairie Allotment, some of the problems discussed in the literature are evident, mainly reduction of riparian vegetation and associated changes to stream channels. The proposed action is designed to reduce the effects to stream habitat and fish described above, mainly by preventing cattle from accessing the most sensitive riparian areas (the headwater meadows), and by reducing the amount of time they spend in other riparian areas.

**Alternative 1 – No Grazing**
**Direct, Indirect, and Cumulative Effects**
As stated in the hydrology section, water quality and habitat conditions for fish in general would improve if grazing ceased on the allotment. Erosion, sediment deposition, and bank trampling would be reduced. Water temperatures would decrease as stream shading increased over time. Also, bank stability would increase, and stream channels would become more complex and diverse. Although there could be some short-term sediment input as allotment fences near or crossing streams were removed, this alternative would have a beneficial effect or impact on all aquatic species that reside within or downstream of the allotment.

**Alternative 2 – Current Management with Slight Modifications**
**Direct Effects**
Cattle grazing and associated activities on the allotment would have no direct effects to steelhead or rainbow trout that reside downstream from the allotment boundary or potentially within the boundary in North Fork Mill Creek. Direct effects are those that result from the proposed activity, and because neither species is present where cows are, there are no direct effects.

The primary direct impacts to cutthroat trout and their habitat within the allotment area may include the following:

- Harassment or displacement of juvenile or adult trout from their rearing habitat due to the presence of cattle or permittees working in or along the stream.
- Direct mortality of fish due to trampling, especially in isolated pools that are present in the headwaters of both West Fork Neal and North Fork Mill Creeks from mid to late summer and into fall (depending on water availability). Field personnel have observed

fish that appear to be trapped within these small pools during the summer months. Their inability to migrate to deeper pools or cooler water most certainly is stressful and several dead fish have been found in these reaches.

- A continuation of existing reduced shade potential provided by riparian vegetation, and the cover provided by such shade, if that vegetation is browsed.
- There is a risk, albeit low, of trampling spawning gravels containing incubating eggs or sac-fry by livestock. In most years fry should emerge from the gravel by mid-July, so this direct impact would be relevant to only those pastures where cattle are present before mid-July. If cattle are turned out in mid-June, there is a whole month of this potential direct impact.

**Indirect Effects**

Indirect effects for steelhead or rainbow trout relate primarily to habitat degradation from grazing itself and the potential effects downstream. Habitat components for steelhead or rainbows that would be affected include sediment, possibly water temperature, and nutrient enrichment. Some of these impacts could be carried downstream and, in combination with natural and anthropogenic influences, could have an effect. In other words, degraded stream conditions downstream may be exacerbated, though probably at a low level, by grazing activities within the allotment.

Indirect effects for cutthroat trout within the allotment relate primarily to habitat degradation from grazing itself. Habitat components for cutthroat trout that would be affected include sediment, channel shape and condition, nutrient enrichment, a degradation of meadow refugia in the headwaters areas, and some degradation to riparian reserves.

Grazing activities may result in more bank erosion and thus more sediment entering streams. As stated above, unstable streambanks and large amounts of fine sediment have been documented in both West Fork Neal Creek and North Fork Mill Creek. Pebble count data indicates sand and silt dominate the substrate in the headwaters of North Fork Mill Creek (44%) and the headwaters of West Fork Neal Creek also contain relatively large amounts of sand/silt substrate (19%). Although it is impossible to determine if all of the erosion and sediment is due solely to cattle grazing (there are elk and deer in the area plus other natural and anthropogenic sediment sources) the frequent observations of cattle in and around the streams as well as the literature indicate at least some of the degradation is due to livestock.

The low gradient headwaters of the small streams in the allotment have limited ability to transport sediment (the year-round flow in each of the upper headwaters of these streams is only one cubic foot per second (cfs) or less by mid-summer. Due to increased accumulated sediment that is present in the streams as a result of grazing activities, sediment flushes that occur during flood events could be larger than they would be naturally. Still, it is unlikely that sediment that is present in the stream channel as a result of bank trampling and the resulting erosion is consistently transported to locations as far downstream as steelhead and rainbow trout are known to be present. (See Hydrology section, Alternative 2 – Sediment Direct and Indirect Effects).

Adult and juvenile cutthroat trout have been documented high into the wet marshes and springs at the headwaters of both North Fork Mill Creek and West Fork Neal Creek during the spring

and early summer (Mt. Hood National Forest, unpublished data). While some of these headwater channels appear to be ephemeral and some dry up by mid-summer, they likely play an important role by providing additional spawning and rearing habitat during late winter, spring and early summer months. Over the years, continual streambank trampling and vegetation loss due to livestock in these channels has increased the amount of erosion and fine sediment and has probably overloaded the sediment carrying capacity of these small tributaries. Depending on the amount, this extra fine sediment could cover spawning gravels and/or food producing riffle areas. Survival of rainbow and particularly cutthroat trout embryos declines rapidly as the amount of sediment < 6mm in diameter increases beyond 10-15% of the total (Bjornn and Reiser, 1991). The relationship also holds true for steelhead although the curve is not as steep and mortality does not begin to increase rapidly until the amount of fine sediment approaches or exceeds 30% (Bjornn and Reiser, 1991). Given the large amount of fine sediment in the headwaters, which is at least partially attributable to livestock, it is likely cutthroat reproductive success has been reduced.

Concentrated cattle grazing along creeks can lead to bank instability due to trampling of the banks by cows and a reduction or loss of riparian vegetation with a concurrent loss of root strength. This bank instability leads to stream widening because of sloughing and banks that are more readily eroded during higher flow events. Over-widened stream channels result in higher width to depth ratios and generally reduce habitat complexity and overall quality for salmonids. Wide, shallow streams also result in more water surface area exposed to solar radiation that can increase water temperatures compared to an unaltered stream (although this is not happening in the allotment based on available water temperature information). Instances of bank instability leading to the above described conditions were noted by stream surveyors in both West Fork Neal and North Fork Mill Creeks, leading to localized habitat degradation. However, not the entire stream channel, even in high use areas, has been degraded as described above.

This alternative proposes to place down wood along West Fork Neal Creek in Long Prairie and along the headwaters of North Fork Mill Creek in Gibson Prairie. Once completed these measures would lead to an overall reduction of sedimentation in the streams the associated damage to the stream banks would be reduced.

Nutrients in animal wastes may stimulate algae and aquatic plant growth (Bauer and Burton, 1993). Although at moderate levels the increase in aquatic plants may have little to no effect to water quality, high levels can lead to reduced dissolved oxygen levels. An increase in nutrient levels in Neal, West Fork Neal or North Fork Mill Creeks has not been documented although studies to monitor this have not been conducted. However, it is probable that some increase in nutrients has occurred in the headwaters given the documented occurrence of cows and cow feces in both streams. In areas with good riparian vegetation nutrient enrichment is less because the vegetation buffers the stream from direct waste input and assimilates the nutrients into the plant tissue (Bauer and Burton, 1993). There is a probability, albeit slight, that nutrient inputs that occur in the headwaters of Neal, West Fork Neal, and North Fork Mill Creeks could be transported downstream where they could affect aquatic plant growth rates.

Over time the aggregate effect of reductions in habitat quality may adversely affect the health and abundance of the resident fish populations in Neal, West Fork Neal, and North Fork Mill

Creeks. The level of stress that fish experience as a result of habitat degradation depends on several factors, including how long the fish species is exposed to increased temperatures and which life stage is impacted. A reduction in oxygen can result in a loss of feeding efficiency and increased susceptibility to disease. Less riparian vegetation may limit essential summer food sources. The reduction in available habitat can lead to increased competition for food, reduced space, greater crowding, and increased vulnerability to predation. The overall impact of all these factors is a reduction in the size and/or fitness of the resident cutthroat populations.

**Cumulative Effects**

The cumulative effects analysis area for effects to fisheries includes both the West Fork Neal Creek and North Fork Mill Creek watersheds. Cumulative activities evaluated as part of this analysis include: anticipated timber harvest proposed as part of the North Fork Mill Creek planning effort; anticipated timber harvest on private lands; the increase in recreation, including the illegal construction of off-road vehicle trails; and, two ongoing fencing projects that will be implemented in the allotment in September 2005.

Cows have been grazing on the Long Prairie Allotment for almost 100 years. No baseline data exists for stream or riparian conditions before cattle began grazing in Neal, West Fork Neal, and North Fork Mill Creeks. As stream surveys conducted recently on the streams indicate, fish habitat conditions are below thresholds established by NMFS and the Mt. Hood National Forest in some reaches, specifically for large, woody material and pools. It is not possible to correlate a long history of grazing activity in the area with the low quality habitat. Several timber sales have taken place in each watershed, and roads have been built near each creek.

In light of multiple other factors that could continue to degrade fish habitat in the 7$^{th}$ field watersheds, including recreation (hiking, horse, and OHV trails), and future timber harvest, the presence of cows could have an exacerbating deleterious effect, at least in the headwaters, especially if the number of livestock were increased to 105 cow/calf pairs. Specifically, sedimentation and water quality could worsen over time. However, this does not consider the improvement to land management practices including road building and logging practices.

Future actions that are reasonably certain to occur in the future on the allotment within the privately-owned portion include timber harvest in the riparian areas along both West Fork Neal and Neal Creeks. A previous landowner harvested timber in the headwaters of Neal Creek and an unnamed tributary to West Fork Neal immediately after he obtained the land in 1994. SDS Lumber now owns the land and it is expected that future harvest would occur (the reach of West Fork Neal Creek that is located on this land extends from river mile 2.3 – 7.0, and the reach of Neal Creek on his land is from river mile 8.8 – 10.3, the headwaters). Also, it is likely that timber harvest activities will continue on land owned by Hood River County downstream from the privately-owned land. However, the building of new roads near the creek will probably not occur, as most timber within the riparian areas on both the privately-owned and County-owned land was harvested recently.

Impacts to fish from potential continued timber harvest on private and county lands near West Fork Neal and Neal Creek may include increased sedimentation which could degrade spawning

areas and smother incubating eggs in redds, and increased water temperature. Both impacts would be a result of decreased riparian vegetation.

Since the habitat degradation in Neal, West Fork Neal, and North Fork Mill creeks is affected by a multitude of influences off-forest, it is difficult to ascertain whether grazing activities within the allotment contribute to the problem and if so how much. Most of the degraded sites are localized in the hotspot areas and based on the available data it does not appear that conditions downstream are a result of grazing, though it is difficult to tease out grazing impacts from other anthropogenic influences. Thus direct ties between habitat degradation in the reaches where steelhead or rainbows are known or suspected to be present and activities on the grazing allotment (and specifically downstream impacts) cannot be conclusively made. There are, however, direct ties between habitat degradation and grazing in the streams within the allotment where cutthroat are present.

Other activities have the potential to improve aquatic habitat. The Forest Service, together with the Confederated Tribes of the Warm Springs Indian Reservation is constructing two exclosure fences in September 2005. One would exclude cattle out of the riparian area along West Fork Neal Creek (just north of the current corrals in Long Prairie) and the other would exclude cattle from the western-most headwaters fork of West Fork Neal Creek to protect this area from cattle trampling and stream crossings. This would help to prevent adverse direct impacts to fish and their habitat.

**Alternative 3 – Proposed Action**

**Direct Effects**

Cattle grazing and associated activities on the allotment would have no direct effects to steelhead or rainbows that reside downstream from the allotment boundary or potentially within the allotment in North Fork Mill Creek. Project design features such as fencing and range improvements, pasture configuration and grazing scheme, turn-out/gather and salting locations, and the proximity of grazing to habitat where ESA listed species occur would prevent any adverse direct impacts to fish and their habitat. Although steelhead and rainbows could potentially be present in North Fork Mill Creek within the allotment boundary, cattle do not use the area due to steep terrain and heavy timber. Also, proposed fences would exclude cows from the area where steelhead and redband could potentially be present in North Fork Mill Creek. The design features proposed would also greatly reduce or eliminate the direct effects to cutthroat trout that are described above under Alternative 2, even with the potential increase in AUMs proposed.

**Indirect Effects**

As described in the hydrology section, implementation of the proposed action would improve water temperatures (albeit a slight amount) and will reduce both sedimentation and nutrient enrichment associated with grazing on the allotment. Thus, indirect effects described under Alternative 2 above to steelhead and rainbows that reside downstream and would be greatly reduced (by at least fifty percent) or eliminated.

Proposed design features, including fencing and range improvements, the pasture configuration and grazing scheme, and turn-out/gather and salting locations would prevent cattle from continuing to damage stream banks and to degrade the headwaters of the streams. Although

there may be some short-term sedimentation when fences are constructed near or crossing streams or when down wood is placed along stream banks, overall habitat conditions within the allotment for cutthroat would improve over the long term as riparian areas recover, and indirect effects associated with grazing would be substantially reduced.

**Cumulative Effects**

Future actions that are reasonably certain to occur in the future on the allotment within the privately-owned portion include timber harvest in the riparian areas along both West Fork Neal and Neal Creeks. A previous landowner harvested timber in the headwaters of Neal Creek and an unnamed tributary to West Fork Neal immediately after he obtained the land in 1994. SDS Lumber now owns the land and it is expected that future harvest would occur (the reach of West Fork Neal Creek that is located on this land extends from river mile 2.3 – 7.0, and the reach of Neal Creek on his land is from river mile 8.8 – 10.3, the headwaters). Also, it is likely that timber harvest activities will continue on land owned by Hood River County downstream from the privately-owned land. However, the building of new roads near the creek will probably not occur, as most timber within the riparian areas on both the privately-owned and County-owned land was harvested recently.

Impacts to fish from potential continued timber harvest on private and county lands near West Fork Neal and Neal Creek may include increased sedimentation which could degrade spawning areas and smother incubating eggs in redds, and increased water temperature. Both impacts would be a result of decreased riparian vegetation.

A separate Decision Memo was completed that would relocate the Long Prairie corral and exclude cattle from the headwaters of West Fork Neal Creek with the construction of an exclosure fence. This exclosure fence will be completed in September 2005. The new fence within Long Prairie Pasture will prevent cattle from accessing the stream within the pasture. An additional buck and rail fence exclosure at the western-most headwaters fork of West Fork Neal Creek (analyzed as part of another NEPA document) will protect this area as well. Although cows would still have access to some riparian areas within the allotment, the areas most heavily-used by cattle in the past, which are also the most-sensitive headwaters areas, would be protected by fencing. This would add to the other proposed range improvements in the allotment and help prevent any adverse direct impacts to fish and their habitat

As described in the hydrology section, key components of fish habitat (water temperature, sediment, and nutrients) would be slightly improved over time if parameters of the proposed action are implemented, both within the boundaries of the allotment and downstream. Still, the myriad other activities that are reasonably likely to occur on federal and private land within or near the allotment make it difficult to assess the magnitude of habitat improvement that should occur under the proposed action. Cumulative effects of the proposed action would be similar to those for Alternative 2, with improved (though probably immeasurable at the 7$^{th}$-field scale) conditions for fish and other aquatic species present.

**Determination of Effects – Essential Fish Habitat**

When the Magnuson-Stevens Act of 1976 was re-authorized in 1996, it directed Regional Fishery Management Councils to identify Essential Fish Habitat (EFH) for commercial fish

species of concern. Effects analysis contained here and in the Biological Assessment address potential effects to EFH for steelhead. The Long Prairie Grazing Project is not expected to adversely affect fish habitat in the Lower Hood River basin or the Mill Creek basin. Three salmonid species are identified under the MSA: Chinook salmon, coho salmon, and Puget Sound pink salmon. These species are not present in the project area or action area of the proposed action. The proposed action will have **No Adverse Effect** on Essential Fish Habitat for any of these species as designated under the 1996 Amendment to the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

**Determination of Effects – TES Aquatic Species and Associated Habitat**

**Table 3-20. Summary of Effects on TES, Proposed Critical Habitat, and EFH**

| Species or Habitat | Status | Alternative 1 No Grazing | Alternative 2 Current Management with Slight Modifications | Alternative 3 Proposed Action |
|---|---|---|---|---|
| Lower Columbia River Steelhead | Threatened | BE | NLAA | NLAA |
| Middle Columbia River Steelhead | Threatened | BE | NLAA | NLAA |
| Redband Trout | Sensitive | BI | MIIH | MIIH |
| Columbia duskysnail *Lyogyrus spp.* | Sensitive | BI | MIIH | MIIH |
| Lower Columbia River Steelhead Critical Habitat | Proposed | Will Not Adversely Affect | Will Not Adversely Affect | Will Not Adversely Affect |
| Middle Columbia River Steelhead Critical Habitat | Proposed | Will Not Adversely Affect | Will Not Adversely Affect | Will Not Adversely Affect |
| Essential Fish Habitat | N/A | No Adverse Affect | No Adverse Affect | No Adverse Affect |

BE = Beneficial Effect
NLAA = May Effect – Not Likely to Adversely Affect
BI = Beneficial Impact
MIIH = May Impact Individuals or Habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species

Consistency with the Aquatic Conservation Strategy has been met at the fifth-field watershed scale. Information on the existing condition and effects of the proposed action can be found in both the hydrology and fisheries sections. Much of this information was gathered from the Mill Creek Watershed Analysis; the Biological Assessment prepared for consultation with the National Marine Fisheries Service; literature reviews, and field surveys. The project is devised to contribute to maintaining or restoring the fifth-field watershed over the long term through the design of range improvements that would exclude cattle from an important drainage, and contribute to better distribution across the allotment and away from riparian areas.

Consultation with the National Marine Fisheries Service (NMFS) was completed and a letter of concurrence was received on June 7, 2005 (reference number for the letter of concurrence is NMFS No. 2005/02210). The letter of concurrence can be found in the project file at the Hood River Ranger District.

# Wildlife

## Existing Condition

The Endangered Species Act, the Mt. Hood National Forest Land and Resource Management Plan, Surveyor's Ridge Late Successional Reserve Assessment, Mill Creek Watershed Analysis, Migratory Bird Treaty Act, and the Northwest Forest Plan were all used in this analysis. The status of threatened, endangered, and proposed species; Forest Service, Pacific Northwest Region sensitive species; Northwest Forest Plan special mention species and Mt. Hood National Forest management indicator species with potential to occur in the project area are as follows:

**Table 3-21. Wildlife Survey Results**

| Species | Habitat | Surveys | Presence |
|---|---|---|---|
| **Threatened, Endangered or Proposed** | | | |
| Bald eagle *(Haliatus leucocephalus)* | N[1] | - | - |
| Northern spotted owl *(Strix occidentalis caurina)* | Y[1] | N[2] | Y[1] |
| Canada lynx *(Lynx canadensis)* | N[1] | Y[1] | N[1] |
| **R6 Sensitive Species** | | | |
| Oregon Slender salamander *(Batrachoseps wrighti)* | Y | Y | N |
| Larch Mountain salamander *(Plethodon larselii)* | Y | Y | N |
| Cope's giant salamander *(Dicomptodon copei)* | N | - | - |
| Cascade torrent salamander *(Rhyocotriton cascadae)* | N | - | - |
| Oregon spotted frog *(Rana pretiosa)* | N | - | - |
| Painted turtle *(Chrysemys picta)* | N | - | - |
| Northwestern pond turtle *(Clemmys marmorata marmorata)* | N | - | - |
| Baird's shrew *(Sorex bairdii permiliensis)* | N | - | - |
| Pacific fringe-tailed bat *(Myotis thysanodes vespertinus)* | N | - | - |
| Wolverine *(Gulo gulo luteus)* | Y[1] | - | - |
| Pacific fisher *(Martes pennanti)* | Y[1] | - | N |
| Horned grebe *(Podiceps auritus)* | N | - | - |
| Bufflehead *(Bucephala albeola)* | N | - | - |
| Harlequin duck *(Histrionicus histrionicus)* | N | - | - |
| Peregrine falcon *(Falco peregrinus anatum)* | N | - | - |
| Gray flycatcher *(Empidonax righti)* | N | - | - |
| Puget oregonium *(Cryptomastix devia)* | Y | Y | N |
| Columbia oregonium *(Cryptomastix hendersoni)* | Y | Y | N |
| Dalles sideband *(Monadenia fidelis minor)* | Y | Y | N |
| Crater Lake tightcoil *(Pristiloma arcticum crateris)* | Y | Y | N |
| Evening fieldslug *(Deroceras hesperium)* | Y | Y | N |
| **Mt. Hood NF Management Indicator Species and Neotropical Birds** | | | |
| Mule/Blacktailed Deer *(Odocoileus hemionus)* | Y | - | Y |
| Rocky Mountain Elk *(Cervus elaphus)* | Y | - | Y |
| Pine Martin *(Martes Americana)* | Y | - | - |
| Pileated Woodpecker *(Dryocopus pileatus)* | Y | - | - |
| Western Gray Squirrel *(Sciurus griseus)* | N | - | - |
| Wild Turkey *(Meleagris gallopavo)* | Y | - | - |
| Snag and Down Log Associated Species | Y | N | Y |
| Neotropical Migratory Birds | Y | N | Y |

| Special Mention Species | | | |
|---|---|---|---|
| Black-backed woodpecker *(Picoides arcticus)* | N | - | - |
| Flammulated owl *(Otus flammeolus)* | N | - | - |
| Pygmy nuthatch *(Sitta pygmaea)* | N | - | - |
| White-headed woodpecker *(Picoides albolarvatus)* | N | - | - |
| | | | |

1. See narrative.
2. The last surveys were conducted in 1993. In accordance with the NWFP, additional surveys are not needed in this area.

**Threatened and Endangered Species**

The following threatened, endangered, proposed, or sensitive species are known or suspected to occur on the Hood River Ranger District. The complete terrestrial species Biological Evaluation which is used for the purpose of consultation with the US Fish and Wildlife Service (USFWS) is located in the project file at the Hood River Ranger District. The analysis and conclusions of the assessment are summarized below.

**Bald eagle**

There is no potential habitat within or adjacent to the planning area, nor have bald eagles been observed in the area. The closest known eagle nest site is near The Dalles, Oregon.

**Northern spotted owl**

Baseline spotted owl information for the Mt. Hood National Forest may be found in the Biological Opinion for Habitat Modification 2005-2006 (FWS Reference Number 1-7-05-F-0228).

There are no spotted owl historic activity centers within the Long Prairie Allotment area. Nesting, roosting and foraging habitat (NRF) plus dispersal habitat exists within the allotment area. The Long Prairie Allotment area has not being surveyed for spotted owls within the last three years thus presence is assumed. The western portion of the allotment area falls within the Surveyor's Ridge Late Successional Reserve (LSR). Cattle are not using the majority of the LSR area within the allotment because of the steepness of topography. Cattle are using mainly the regeneration harvest units within the LSR.

The Long Prairie Allotment area is not part of any designated critical habitat. Grazing does not affect habitat, but harrassment from fence maintenance, construction and people presence may affect spotted owls.

**Lynx**

On July 8, 1998, the USFWS published a proposed rule to list Canada lynx (lynx) under the Endangered Species Act (Federal Register Volume 63, No. 130). The final rule listing the lynx as "Threatened" was published on March 24, 2000. In the listing the USFWS considered lynx to have been historically resident within 14 states including Oregon. More recently the USFWS has stated that there is no evidence that a resident lynx population ever occurred in Oregon (Federal Register Volume 68, 40076, 40089-90, July 3, 2003).

Winter snow track surveys were conducted on the Mt. Hood National Forest in 1994-96 with no evidence of lynx being found. Preliminary results of a hair sample survey completed in 1998 suggested the presence of lynx in the Cascade Range in Oregon (Weaver and Amato 1999).

Review of Weaver and Amato's 1999 preliminary results determined the samples were contaminated and did not indicate lynx presence (Weaver et al, 2001). Three more years (1999-2001) of hair sample surveys have been conducted on the Mt. Hood National Forest and all results have been negative. Therefore there is no evidence of lynx presence on the Mt. Hood National Forest.

In January 2001, standards and guidelines for the management of lynx were addressed in the Final Supplemental Environmental Impact Statement (FSEIS) and *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*. This FSEIS and Record of Decision amended the Northwest Forest Plan and therefore the Mt Hood Forest Plan. These standards and guidelines direct that the Lynx Conservation and Assessment Agreement (LCAS) will be used and referenced in all determinations of effect for Canada lynx. These same standards and guidelines for Canada lynx were retained in the March 2004 *Record of Decision To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines*.

Lynx habitat as described in the LCAS and subsequent interpretation is not expected to occur on the Mt. Hood National Forest. The LCAS identified subalpine fir plant associations as the primary vegetation component from which lynx habitat and lynx analysis units would be delineated. The LCAS identified a need for at least 10 square miles (6400 acres) of primary vegetation to warrant delineation of a lynx analysis unit (LAU). "Based on studies at the southern part of the lynx range in western U.S., it appears that at least 10 $mi^2$ of primary vegetation should be present within each LAU to support survival and reproduction" (LCAS, 7-4). The Forest ran an analysis based on plant association groups on the Mt. Hood National Forest and identified only 1270 acres of subalpine fir plant associations primarily on the east side of the Forest. There are no subalpine fir plant associations in the Long Prairie Allotment area.

Based on the analysis, the Mt. Hood National Forest does not have the minimum criteria to develop a lynx analysis unit. There is no mapped lynx habitat on the Forest or any lynx analysis units within which to apply the LCAS habitat objectives. Lynx are not considered to be present on the Mt. Hood National Forest (see December 3, 2003 letter in the project file).

Therefore, there would be no effect to lynx with any of the alternatives.

**Sensitive Species**
A more detailed wildlife report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below.

**Wolverine**
Wolverine may move through the area while foraging or dispersing, but no denning habitat is present within or adjacent to the allotment area.

Wolverines mainly prey upon deer and elk, and often take advantage of carrion. They do not seem to be limited as much by foraging opportunities as by human disturbance. Wolverines tend to avoid places of high human disturbance (Verts, 1998). The allotment area is not suitable wolverine habitat. It is possible that wolverine will try to cross through the area, but they would

not stay in the immediate area. Wolverines are not likely to utilize the area because of recreational traffic throughout the year.

**Pacific fisher**
Fisher habitat from a variety of localities within its geographical range commonly is described as widespread, continuous-canopy forests at relatively low elevations (Powell, 1981). Only three specimens of fishers from Oregon have been collected, two from Lane County and one from Douglas County. Fishers have been re-introduced to southern Oregon and small populations have been established. Fishers are primarily carnivorous. Small and medium-sized forest mammals are the primary prey; porcupines, snowshoe hares, tree squirrels, mice and voles are among the most common species preyed upon.

The presence of fisher on the Mt. Hood National Forest has not been confirmed. Winter snow track surveys, camera bait stations and smoke track plates have been utilized in the past decade to determine carnivore and mustelid presence. No fishers were found using these survey techniques.

**Crater Lake Tightcoil**
This terrestrial mollusk is associated with riparian and spring habitat and grazing may impact this species. The allotment area has been surveyed for the presence of this terrestrial mollusk. No individuals were found in the surveys.

**Larch Mountain and Oregon Slender Salamanders**
The allotment area does contain habitat (down large woody material) for the Larch Mt. Salamander and Oregon Slender salamander, as described in the existing survey protocol adopted by the Forest Service's Pacific Northwest Region. Surveys were completed for Larch Mountain salamanders and Oregon slender salamanders in the fall of 2000. No Larch Mountain salamanders or Oregon slender salamanders were found. Surveys for other amphibian species on the Region 6 sensitive species list were not warranted because of the lack of habitat within the allotment area.

**Management Indicator Species (MIS) and Other Species of Concern**
**Pileated Woodpeckers**
Pileated woodpeckers, a management indicator species of late-seral and snag habitat, would likely nest in the late-seral and cathedral stands. No Pileated Woodpecker Habitat Areas (Denoted as B5 Land Allocation in the Mt. Hood National Forest Plan) are located within this allotment area.

**Pine Marten**
The pine marten is another management indicator species that is dependent upon mature forest with downed logs. This species will den within and under logs and use them as travel ways to hunt for prey in the summer and winter. No Pine Marten Habitat Areas (Denoted as B5 Land Allocation, Forest Plan) are located within this allotment area.

**Wild Turkey**
The Merriam's turkey is present within the allotment area. It is generally associated with the ponderosa pine habitat areas within the allotment. Livestock grazing does not impact roost trees. Nest sites are generally not impacted by cattle as a high percentage of the sites are on slopes greater than 30 percent. Winter food supplies are the most critical for this turkey. They compete with livestock and other wildlife species for winter food. Approximately 100 acres of deer and elk winter range (as designated by the Forest Plan) is within the allotment. A drift fence on the ridge above this area, in combination with steep slopes, has been effective in keeping cattle out of the big game winter range area.

**Snags and Down Log Associated Species**
The levels of snag and down log habitat would remain, as grazing does not impact this habitat.

**Deer/Elk**
The majority of the Long Prairie Allotment area is classified as summer range with approximately 100 acres of winter range habitat (see Figure 1-3) for black-tail deer and Rocky Mountain elk, and is inhabited by both during the summer period and winters. Fawning and calving habitat is scattered throughout the planning area, with most concentrated in and near the riparian reserves. Forage-use plots established within the allotment show adequate forage for deer and elk even with the presence of cattle grazing.

There are 59.31 miles of open road within the allotment used to calculate wildlife open road density, for a density of 5.03 miles/mile$^2$ (see footnote, page 54). This is above the 2.5 miles/mile$^2$ standard as outlined in the Mt. Hood Forest Plan. High road densities negatively impact deer and elk use patterns.

**Neotropical Migratory Birds**
These species occupy a variety of structure types (seral types) within the planning area. All habitat structures from late seral (old growth) to early seral openings (existing plantations) that could be expected within the lower western hemlock zone are present. All neotropical species associated with these habitats are assumed to be present.

**Summary of Existing Conditions for MIS and Species of Concern**
Specific surveys for any species of concern or management indicator species were not conducted. None of the special mention species listed within the 1994 Record of Decision (i.e. pygmy nuthatch, white-headed woodpecker, flammulated owl, and black-backed woodpecker) would likely be found within or adjacent to the allotment area because of lack of habitat described for these species. Pileated woodpeckers, Merriam's turkeys, marten and big game are already known to exist or suspected to exist within the allotment area because habitat is present. Potential effects were analyzed assuming presence, if not already known. Pileated woodpeckers and pine martens may be found in the area. Marten have not been documented within the allotment area, but pileated woodpeckers have been heard and seen within the allotment area. Snag and down wood habitat would remain the same.

A variety of neotropical migratory birds can be found within the allotment area. These species are often split into guilds based upon the habitat they use. Guilds associated with late-seral

habitat (e.g. hermit warbler, *Dendroica occidentalis*), very early seral habitat (e.g. chipping sparrow, *Spizella passerina*), riparian habitat (e.g. Wilson's warbler, *Wilsonia pusilla*), and second-growth habitat (e.g. Nashville warbler, *Vermivora ruficapilla*) can be found in the area.

## Environmental Effects

| Table 3-22. Summary of Effects for TES Wildlife Species | | | |
|---|---|---|---|
| **Species** | **Alt. 1** | **Alt. II** | **Alt. III** |
| **Threatened and Endangered Species** | | | |
| Bald Eagle | No Effect | No Effect | No Effect |
| Northern Spotted Owl | ME-NLTAA | ME-NLTAA | ME-NLTAA |
| Canada Lynx | No Effect | No Effect | No Effect |
| **Forest Service Pacific Northwest Region Sensitive Species** | | | |
| Larch Mountain Salamander | No Impact | No Impact | No Impact |
| Oregon Slender Salamander | No impact | No Impact | No Impact |
| Wolverine | MII | MII | MII |
| Pacific fisher | No Impact | No Impact | No Impact |
| Crater Lake tightcoil | No Impact | No Impact | No Impact |
| Puget oregonium | No Impact | No Impact | No Impact |
| Columbia oregonium | No Impact | No Impact | No Impact |
| Dalles sideband | No Impact | No Impact | No impact |
| Evening fieldslug | No Impact | No impact | No impact |
| | | | |

MEILTAA—May Effect and Is Likely To Adversely Affect
ME-NLTAA—May Effect-Not Likely To Adversely Affect
MII- May Impact Individuals, but are not likely to impact populations, nor contribute to a potential loss of viability of the species

**Threatened, Endangered or Proposed Species**
**Bald Eagle**
There is no potential habitat wihin or adjacent to the allotment area, nor have bald eagles been observed in the area. There would be no direct, indirect or cumulative effects to bald eagles. The determination would be **No Effect** to bald eagles.

**Northern Spotted Owl**
**Alternative 1 – No Grazing**
**Direct, Indirect, and Cumulative Effects**
The elimination of cattle grazing would eliminate disturbance to spotted owls from any grazing associated activities.

**Alternatives 2 and 3**
**Direct and Indirect Effects**
No habitat modification is associated with these activities.

The noise related activities for grazing were consulted on and fall under the *Miscellaneous special uses (low intensity)* category in the *Biological Opinion and Letter of Concurrence for Effects to Bald Eagles and Northern Spotted Owls for fiscal year 2004-2005 disturbance activities within the Willamette Province* (FWS Reference Number 1-7-04-F-0184). Those noise

related activities that occur between March 1-September 30 have an effect determination of **May Affect Not Likely to Adversely Affect** for spotted owls.

It is recommended that disturbance activities in occupied or unsurveyed, suitable spotted owl habitat between March 1 and July 16 should be scheduled as late in spotted owl nesting season as is operationally feasible.

In a comment letter received from Bark/Oregon Natural Resources Council, there was some concern that fences may negatively affect wildlife by changing movement patterns and causing collisions with wildlife (including northern spotted owl). The majority of the fences within this allotment have been established for 50 plus years. Wildlife movement patterns have already been established with the current fencing pattern. Fences have not caused any documented collisions with wildlife.

**Cumulative Effects**
The cumulative effects analysis area is the allotment area boundary because the disturbance from range management activities are expected to be limited to the allotment area. There would be no measureable change in cumulative effects with or without grazing. Disturbance related activities such as horseback riding, mountain biking, off-road vehicles, hiking, hunting, and driving would continue and most likely increase over time. The *Status and Trends in Demography of Northern Spotted Owls* (Foresman et.al. 2004) states that the spotted owl numbers have fallen by roughly half over the past decade in parts of Washington and Oregon's Warm Springs Reservation, and they have dwindled by nearly a quarter in sections of Oregon's Coast and Cascade ranges. In only a few areas are owls maintaining their populations. Disturbance to spotted owls was not mentioned as a reason for the decline in populations. This report does not add any new information or suggest that grazing would have a detrimental effect on spotted owls or their recovery.

**Lynx**
**Direct, Indirect, and Cumulative Effects of all Alternatives**
There are no direct or indirect effects since lynx are not thought to be present on the Mt Hood NF. There would be **No Effect** to lynx. Considering the past, present and future activities described above, there are no cumulative effects since lynx are not thought to be present on the Mt Hood National Forest.

**Sensitive Species**
**Wolverine**
**Alternative 1 – No Grazing**
**Direct and Indirect Effects**
Human disturbance would continue from recreational and administrative uses. This alternative would reduce human disturbance but because of other anthropomorphic disturbances that would likely continue, eliminating grazing would not be enough to attract wolverines.

**Direct and Indirect Effects of Action Alternatives**
There would be no change in the use patterns of wolverines with either action alternative from the existing condition. Wolverines are not likely utilizing the area because of the recreational uses throughout the year.

**Cumulative Effects**
The cumulative effects area of consideration is the Long Prairie Allotment area. The past, present and future activities described above were considered in this cumulative effects analysis. There would be no measurable change in cumulative effects since wolverines are not likely utilizing the area because of the recreational uses throughout the year.

**Pacific Fisher**
**Direct, Indirect and Cumulative Effects**
There would be no direct, indirect or cumulative effects since fishers are not thought to be present in the allotment area.

**Crater Lake Tightcoil**
**Direct, Indirect and Cumulative Effects**
There would be no direct, indirect or cumulative effects as no individuals were found during the surveys.

**Larch Mountain and Oregon Slender Salamanders**
**Direct, Indirect and Cumulative Effects**
There would be no direct, indirect, or cumulative effects as surveys were negative and grazing would not disturb habitat.

**Other Species**

**Snags and Down Log Associated Species**
**Direct, Indirect and Cumulative Effects**
The level of snags and logs within the planning would likely stay the same. Natural ecological succession would replace snags and logs lost. Cattle grazing would have no impact on snag and down log dependant wildlife species. Any projects that may be proposed as part of the North Fork Mill Creek planning effor would retain snags and down logs. Alternative 3 proposes to use some down logs placed along riparian areas to keep cattle out of the riparian areas. These logs would be rearranged on site or moved from adjacent sites. The amount of down logs would remain the same as current levels, however arrangement may change.

**Management Indicator Species and Other Species of Concern**

**Pileated Woodpeckers**
**Direct, Indirect and Cumulative Effects**
There would be no direct, indirect or cumulative effects for pileated woodpeckers, as grazing does not affect their habitat. Current levels of snags would remain.

**Pine Marten**
**Direct, Indirect and Cumulative Effects**
There would be no direct, indirect or cumulative effects for pine martens as grazing does not affect this species. Current levels of logs will be retained as well as current levels of mature forest**.**

**Wild Turkey**
**Effects of Alternative 1 - No Grazing**
There would be an increase in available forage for turkeys with this alternative. Forage does not appear to be the limiting factor for turkeys within the allotment area. Range utilization plots show that the area has adequate forage for wildlife post grazing. No damage would occur to elderberry plants from cattle (ODFW comment, Keith Kohl). The removal of fence structures would be a benefit to turkey movement patterns.

**Direct and Indirect Effects of Action Alternatives**
For Merriam's turkeys, we have little information on the overall effects of grazing on turkey habitat and turkey populations. Forage does not appear to be the limiting factor for turkeys within the allotment area. Range utilization plots show that the area has adequate forage for wildlife post grazing. Roost trees would not be impacted by grazing. Nest sites do not appear to be impacted by grazing in this area as nests are generally found on slopes greater than 30 percent slope. Cattle in general do not go into areas with steep slopes. Some elderberry plants have been damaged by cattle (broken branches) in the late summer or early fall (comment by ODFW, Keith Kohl). Cattle appear to be transitioning from grazing grass to shrubs at this time of the year. This type of damage has not caused the plants to die but may reduce mast production for that year. Based on previous field monitoring, this damage has been localized and has not been noted extensively across the allotment. Without further monitoring to verify this, it is not anticipated that localized damage to elderberry would have a substantial effect on forage for deer and elk.

Winter food supplies are the most critical for this turkey. They compete with livestock and other wildlife species for winter food. Approximately 100 acres of winter range is within the allotment. A drift fence on the ridge above this area has been effective in keeping cattle out of this area. Maintenance of this fence would occur with both action alternatives.

Adaptive Management monitoring would occur with Alternative 3. This type of monitoring would help adjust cattle numbers in the future and ensure adequate forage for cattle and turkeys. Plots would be established to monitor elderberry plant damage caused by cattle. If severe damage were recorded then management actions would be taken (such as exclosure devices or adjusting cattle distribution) to minimize damage. The establishment of new fences may alter turkey movement patterns in the short term until they become use to the new locations.

**Cumulative Effects**
The cumulative effects area of consideration is the Long Prairie Allotment area. There are no cumulative effects from grazing. Grazing does not occur on adjacent Forest Service lands. Some grazing has occurred on adjacent private lands, however land ownership has changed and it is unclear if grazing would occur in the future.

**Deer and Elk**

**Effects of Alternative 1 - No Grazing**

There would be an increase in available forage for deer and elk with this alternative. Forage does not appear to be the limiting factor for deer and elk within the allotment area. Range utilization plots show that the area has adequate forage for wildlife post grazing. No damage would occur to elderberry plants from cattle (ODFW comment, Keith Kohl). The removal of fence structures would be a benefit to elk and deer movement patterns.

**Direct and Indirect Effects of Action Alternatives**

The deer and elk population would remain the same as current levels. Forage does not appear to be the limiting factor for deer and elk within the allotment area. Range utilization plots show that the area has adequate forage for wildlife post grazing. Some elderberry plants have been damaged by cattle (broken branches) in the late summer or early fall (comment by ODFW, Keith Kohl). Cattle appear to be transitioning from grazing grass to shrubs at this time of the year. This type of damage has not caused the plants to die but may reduce forage for that year. Based on previous field monitoring, this damage has been localized and has not been noted extensively across the allotment. Without further monitoring to verify this, it is not anticipated that localized damage to elderberry would have a substantial effect on forage for deer and elk.

In Alternative 3, the proposed, one-mile fence excluding cattle from North Fork Mill Creek drainage may affect deer and elk. Fences may negatively affect wildlife by changing movement patterns and causing collisions. However, fences have not caused any documented collisions with wildlife on the allotment. As a mitigation, any newly constructed or reconstructed fences would follow specifications to allow for wildlife passage.

Winter food supplies are the most critical for deer and elk. They compete with livestock and other wildlife species for winter food. Approximately 100 acres of winter range is within the allotment. A drift fence on the ridge above this area has been effective in keeping cattle out of this area. Maintenance of this fence would occur with both action alternatives.

Adaptive Management monitoring would occur with Alternative 3. This type of monitoring would help adjust cattle numbers in the future and ensure adequate forage for cattle and big game. Plots would be established to monitor elderberry plant damage caused by cattle. If severe damage were recorded then management actions would be taken (such as exclosure devices or adjusting cattle distribution) to minimize damage. The establishment of new fences may alter deer and elk movement patterns in the short term until they become use to the new locations.

**Cumulative Effects**

The cumulative effects area of consideration is the Long Prairie Allotment area. Cumulative activities evaluated for this assessment include: existing range improvements on the allotment, two ongoing fencing projects that will be implemented in the allotment in September 2005; and, the increase in recreation, including the illegal construction of off-road vehicle trails.

The Forest Service, together with the Confederated Tribes of the Warm Springs Indian Reservation is constructing two exclosure fences in September 2005. One would exclude cattle out of the riparian area along West Fork Neal Creek and the other would exclude cattle from the western-most headwaters fork of West Fork Neal Creek. These new fences, together with the

proposed fence in Gibson Prairie and the existing 10 miles of boundary and pasture division fences existing on the allotment would have a cumulative impact on wildlife movement patterns. However, the majority of the fences within this allotment have been established for 50 plus years. Wildlife movement patterns have already been established with the current fencing pattern. Fences have not caused any documented collisions with wildlife on the allotment. The high road density in the area in combination with the fences could have a negative effect on distribution and use by deer and elk.

There are user-created, illegal, off-road vehicle trails within the allotment that were constructed in early 2005. Together with the fencing on the allotment, this could affect movement patterns for deer and elk. However, a temporary area closure has been effective at eliminating off-road vehicle use and the trails have already had some recovery and regrowth. The Forest is currently conducting a planning effort to identify new recreation trails in this allotment. This together with the high road density in the area could increase harassment and/or alter big game movement patterns.

**Neotropical Migratory Birds**
**Effects of Alternative 1 - No Grazing**
Bird species dependent upon late-seral habitat, would not have any change from the existing condition, as this structure type would remain constant through this alternative. Species dependant upon early-seral habitat would lose habitat within timbered stands as the trees age. The open meadows such as Long Prairie and Gibson Prairie would remain early-seral habitat into the future. Bird species dependent upon riparian habitat would see some improvement in their habitats with this alternative. Species dependent upon mid-seral stands would not have any change from the existing condition, as this structure type would remain constant through this alternative.

**Direct and Indirect Effects of Action Alternatives**
Bird species dependent upon late-seral habitat, would not have any change from the existing condition, as this structure type would remain constant through all the alternatives. Species dependant upon early-seral habitat would lose habitat within timbered stands as the trees age. The open meadows such as Long Prairie and Gibson Prairie would remain early-seral habitat into the future. Bird species dependent upon riparian habitat would not see much of a change in their habitats as long as the riparian vegetation is maintained or protected from over utilization by cattle. Species dependent upon mid-seral stands would not have any change from the existing condition, as this structure type would remain constant through all the alternatives.

**Cumulative Effects**
The cumulative effects area of consideration is the Long Prairie Allotment area. There are no cumulative effects from grazing. Grazing does not occur on adjacent National Forest System lands. Some grazing has occurred on adjacent private lands, however land ownership has changed and it is unclear if grazing would occur in the future. Therefore would be no additional riparian habitat impacted.

# Soil Resources

A more detailed soils report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below.

**Analysis Process and Rationale**

For the geology and soils section, the analysis boundary is the allotment boundary. Typically, shovel probe transects are placed within the activity area from one side to the other as in a timber sale unit. However, the assessment of this allotment utilizes more of a high-use or point source type of analysis instead of total percent detrimental soil condition across the entire analysis area. This was done because field reconnaissance indicates that soil impacts are very localized and concentrated in sensitive areas within the allotment boundary. Relative comparison of conditions and watershed values coupled with an evaluation of impacts from the current livestock operation provided a basis for this analysis, resulting in many of the design features in the alternatives. The geographic location of this planning area happens to overlap with another planning effort in the North Fork Mill Creek watershed. Data was gathered for timber-related projects in this area during initial field reconnaissance in the late 1990s. (This analysis can be found in the project file at the Hood River Ranger District.) There were three forested areas evaluated, none of which exhibited heavy compaction problems. Some cattle trails were noted, however. Unfortunately, it is not discernable as to how much compaction can be attributed to cattle alone because most of the livestock trails occurred on old skid roads.

## Existing Condition

**Geology**

This allotment has two distinctly different terrains. Each terrain has its own set of physical characteristics that are determined by the underlying geology and geologic history. The largest terrain unit encompasses the gently sloping ground in West Fork Neal Creek and uppermost North Fork Mill Creek drainages. The rock units are relatively young lava flows and pyroclastic deposits. The lava flows formed a “cap rock”, partially protecting this area from fluvial and glacial erosion. The product of this geologic history is a gently rolling upland with a low drainage density and almost no landslide hazard. The rocks have a low fracture density and as a result groundwater movement is slow. The upper surface of the lava flows weather along the fracture planes to form large subrounded boulders that look out-of-place. The elevations in this upper terrain unit were high enough to support small glaciers that only slightly modified the landscape. The low-angle slopes, poorly developed drainage system, thin glacial till deposits, and low permeability bedrock all contributed to the development of numerous meadows where most of the grazing occurs.

The second terrain unit is the steep-sided valley of North Fork Mill Creek and the west side of Surveyor’s Ridge. Older lava flows in these areas are highly fractured and very susceptible to erosion. Groundwater movement is rapid, drainage density is high, and many hillslope processes are active here. Numerous tributary channels draining these areas are host to frequent debris flows. These channels and their adjacent continuously steep hillslopes are identified on Figure 3-14 as the areas with a “very high” landslide hazard. Landslide material from these areas is efficiently delivered to the valley floor, primarily through debris flows. Other steep hillslopes,

not directly connected to the drainage system, are identified on the map as areas with a "high" landslide hazard. These areas see very little, if any, grazing activity due to difficult accessibility.

**Soils**

Soils across the planning area have been derived from thin volcanic ash deposits that have been modified by glaciation in the upper watersheds. Ash was deposited primarily from Mt. Hood, which sits to the southwest—upwind from the prevailing wind flow patterns. Wind, precipitation events, and landslides continue to alter the original depositional pattern by removing soil completely in some places exposing bedrock, and depositing it in others resulting in deep soils. Soil characteristics vary considerably, occurring on the two basic landscape features introduced in the geology section above. The differences in soil development and ecosystem characteristics between the two landscapes are summarized in Table 3-23 and explained in detail below.

**Table 3-23. Comparison of Ecotype Characteristics in the Long Prairie Allotment**

| | *Gentle Terrain* | | | | *Steep Terrain* |
|---|---|---|---|---|---|
| SRI map unit | 3, 4, 349, 348, 347 → | 162 → | 163, 153 → | 158 → | 210, 211, 212 → 6, 8, 7 |
| Soil characteristics | Moist, Glacial, Deeper, Lower rock content, Gentle → | | | | Steep, High rock content, Shallow, Dry |
| Vegetation | Wet meadows, Cedar/W.Hemlock → | Moist GF* → | Dry GF/Doug fir → | Pond. Pine → | Dry meadow |
| Climate | Cooler, wetter → | | | | Warmer, dryer |
| Organic matter | Average appx 25 tons and six logs per acre → | | | | Average 10 tons and one log per acre |
| Fire frequency/type | Less frequent/stand replacing → | | | | More frequent/underburn |
| Landslides | Very rare, usually small → | | | | More frequent, larger |

Comparison of ecotype characteristics in the Long Prairie Allottment. *GF = Grand Fir

**Soils Occurring on Gentle Terrain in West Fork Neal and Uppermost North Fork Mill Creeks**

Soils within this area are developing on gentle, glaciated terrain where slopes rarely exceed 30%. Soil types occurring in the current allotment include 347, 348, and 349 in the Mt. Hood National Forest Soil Resource Inventory (SRI) (Howes, 1979). These are deep, loamy, well-drained, productive, forested soils that contain slightly higher rock content than described in the SRI. The deep, loamy nature of the soils allows them to store adequate moisture for the growing season. Factors limiting growth here include cool temperatures and nutrient availability. Nutrients on these sites are stored in the duff layer, woody debris, and a very thin light brown topsoil that is found just above a thin, weakly developed spodic (bleached, low pH) soil horizon. This is typical soil development under forested conditions. These soils are grazed only where there have been management activities that have allowed the development of a grass and forb layer (i.e. timber harvest). No evidence of soil damage from grazing was observed on these soils (refer to North Fork Mill Planning Area field notes).

Soil types 3 and 4 (as identified in the SRI) occur in the numerous meadows and prairies located in the headwaters of West Fork Neal, Mosier, and North Fork Mill Creeks. These areas are periodically wet with localized year-round water and stream channel development. Soils are rich in organic matter, dark in color, fine-textured, have excellent fertility, produce thick stands of

grasses and forbs, and are typically underlain by a pan of dense clay that can be observed along exposed streambanks. It is the clay that likely inhibits water percolation down through the soil, perching water seasonally at the surface. These areas tend to be grazed more heavily than other parts of the allotment. Streambank erosion is occurring where cattle have trampled the vegetation, and because the banks are composed of fine material they cannot support the weight of the animals and collapse into the stream channel. The existing corral, turn-out, and roundup location occurs on these soils. Shovel probe samples from the corral and immediate surrounding area show indicators of soil damage, such as alteration of soil structure. However, there is no evidence of overland flow and associated erosion because of sufficient water infiltration. Shovel probe samples from Middle Prairie showed no alteration of soil structure and appears to be in very good condition. Middle Prairie has been fenced off since 2002 and cattle have no access. Undisturbed soils in Middle Prairie and Long Prairie are very similar. Therefore, the difference in existing conditions can likely be attributed to the livestock impacts in Long Prairie.

**Soils Occurring on Steep Terrain in North Fork Mill Creek and Surveyor's Ridge**
Soils within this area are developing on very steep terrain where the average slope is approximately 50%. Slopes range from 5% to over 90% in places. Soil types occurring in the current allotment include 6, 7, 8, 153, 158, 162, 163, 210, 211, and 212 as identified in the SRI. These soils differ from those occurring on the gentle ground in the following ways: they are generally not as deep due to eons of erosion on steep terrain; there are large patches that become droughty during the summer months because of aspect, rock content, shallow depth and lack of precipitation; they have evolved under a more frequent fire regime, resulting in stands of large-diameter, fire-resistant tree species that support more of a grass/forb understory where the canopy is not closed; and, they store more nutrients in the mineral soil itself, rather than just in a thin topsoil, duff, and old logs. In the most productive areas on this landscape, soils were found to be sufficiently deep and loamy to support either dense stands of trees or more spaced out larger trees (sometimes both in the same stand). Factors limiting growth include hot summer temperatures and availability of water and nutrients. Due to steepness and accessibility these areas are generally not grazed heavily or at all.

Soil types 8, 153, and 158 currently experience light grazing pressure where slopes are gentle enough to allow livestock movement. They have the lowest resiliency of all soil types in the allotment due to low organic matter levels, thin topsoils, shallow depth, hot aspect, and high rock content. They currently support weedy grasses such as cheatgrass, which likely invaded during some point in the past when the area was being grazed much more heavily. These areas would be more productive if native grasses were present. Soil types 6 and 7 are not grazed because they are talus slopes and rock outcrops, respectively. Soil types 162, 163, 210, 211, and 212 are too steep to be grazed by livestock.

Taking into account actual field conditions, soil management interpretations differ slightly from those mapped in the SRI. Interpretations are summarized in Table 3-24 below.

In addition, SRI soil mapping was validated and updated as needed. Figure 3-14 is a soil map for the allotment. Soil management interpretations pertinent to grazing activities include surface and subsurface erosion potentials, compaction hazard, and displacement risk, which are displayed in Table 3-24. Erosion ratings are based upon bare soil (no vegetative or duff cover). Ratings were

taken from and defined in the SRI. All have been verified and adjusted according to represent local field conditions.

**Table 3-24. Summary of Soil Management Interpretations**

| Soil Type | Surface Erosion Potential | Subsurface Erosion Potential | Compaction Hazard | Risk of Displacement |
|---|---|---|---|---|
| 3, 4 | Very Slight | Low | Moderate | High |
| 8 | Slight-Moderate | High | Moderate | Moderate |
| 153 | Slight-Moderate | Moderate | Low-Moderate | Low |
| 158 | Moderate-Severe | High | Moderate | Moderate |
| 162, 163, 210, 211, 212 | Moderate-Severe | Moderate-High | Moderate | Moderate-High |
| 347, 349 | Slight | Moderate | Low | Low |
| 348 | Slight-Moderate | Moderate-High | Low | Moderate |

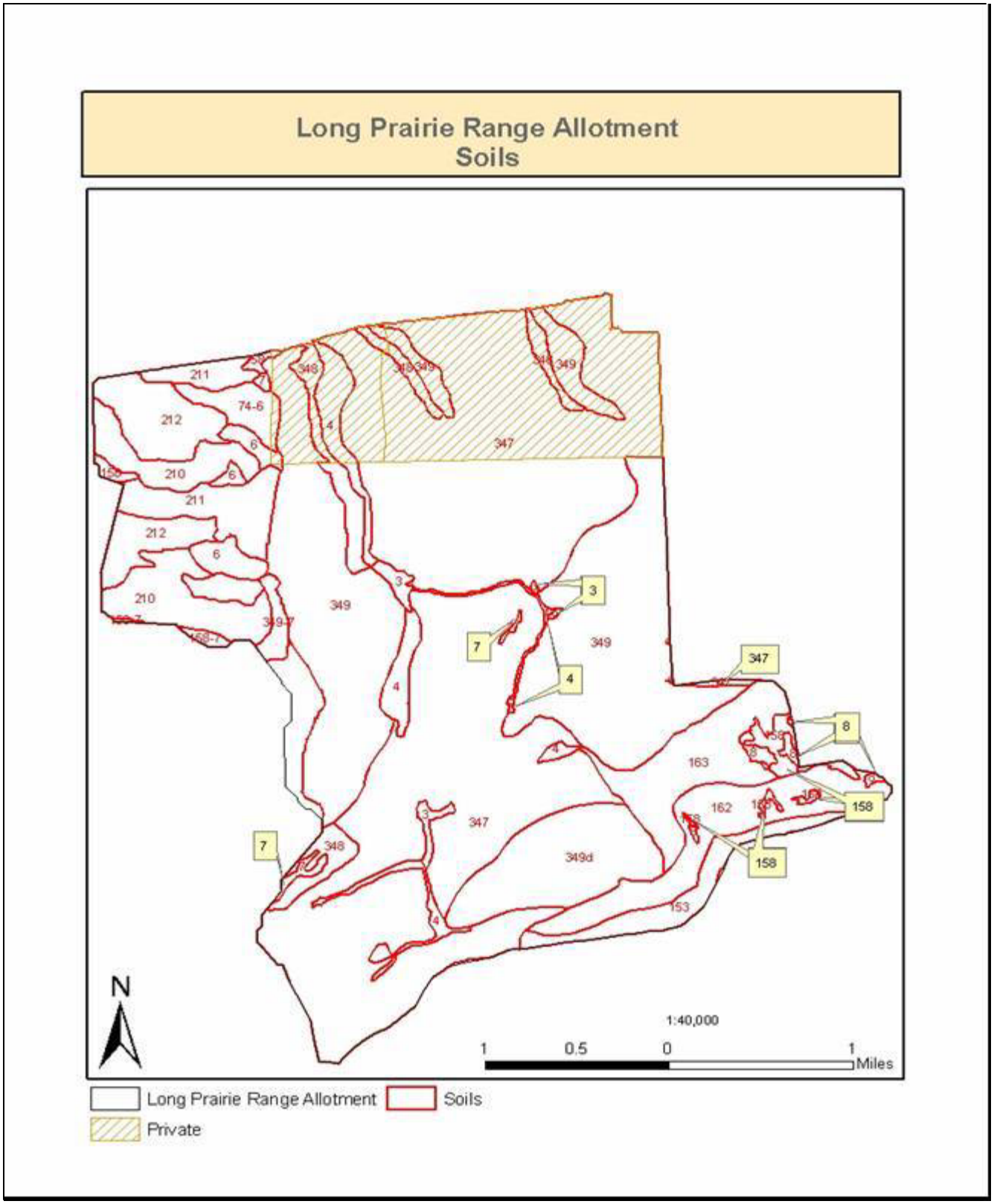


**Figure 3-14. Soil map of Long Prairie Allotment.**
Note: The soil map includes a polygon numbered 74-6. This should "7-6," a complex of rock outcrops and talus slopes.

**Summary of Existing Conditions**
The most sensitive locations of existing soil damage are the streambanks in meadows where livestock damage has occurred. Streambank integrity has been damaged primarily due to physical trampling, although these locations chronically sustain heavy grazing impacts (such as vegetation removal) as well The next most sensitive are dry meadow/scattered conifer locations where forage production is not high due to vegetative changes, rockiness and drought tendency of these areas. The lowest sensitivity areas include the remainder of the allotment (Refer also to Table 3.25). With the exception of the streambank damage and associated erosion and sedimentation, there is no evidence of actively eroding locations or detrimental soil conditions such as compaction attributable to livestock alone. The Mill Creek data shows that there are pockets of existing detrimental soil conditions associated with roads and skid trails in and around old logging units that cattle currently use to move from one location to another (Mill Planning Area Field Notes and Attached Data). In addition, newly constructed illegal off-road vehicle trails in the planning area are impacting both upland and riparian areas. However, the existing, temporary closure to off-road use that was put in place in spring of 2005 has been effective at minimizing those impacts and the trails have already shown some recovery.

## Effects Analysis

**Geology**
Geology resources are not expected to change with the implementation of any of the three described alternatives. Major hillslope processes, especially landslides, occur naturally and on steep land where there is little or no grazing pressure. It is expected that these natural processes will continue to occur slowly, over time regardless of the alternative chosen.

**Soils**

**Alternative 1 – No Grazing**
**Direct, Indirect and Cumulative Effects**
This alternative would allow improvement of soil conditions across the allotment. Removing grazing would increase riparian productivity and ground cover (vegetative basal area and litter) thus reducing current streambank erosion. An increase in vegetative productivity would improve the ability of the soil to infiltrate water and recycle nutrients and would help to improve and maintain long-term soil productivity in the uplands and riparian areas.

Table 3-25 shows current grazing use patterns within the allotment and comparison of soil impacts, followed by a relative rating for soil resiliency and ranking of areas that should receive attention. These priority areas are the high-use areas identified in the purpose and need and are addressed in Alternative 3. A particular soil's resiliency is its ability to withstand and recover from a damaging impact.

Table 3-25 highlights the use and impacts specifically for soil types 3 and 4 (the wet meadows, including the Long Prairie corral area and Gibson Prairie). Due to high organic matter levels, climate, and moisture availability, soil types 3 and 4 are highly resilient and when not grazed would recover relatively quickly compared to other soils in the allotment. This especially

pertains to the streambank damage occurring on West Fork Neal and upper North Fork Mill Creeks. Also, given the current use and practices, other impacted soils in the allotment (such as the soils on old logging roads used by livestock to move from one location to another) should recover over time if they are not grazed or used by motor vehicles.

Soil improvement trends can be considered by using vegetation growth and recovery as an indirect measure of soil productivity. Estimated relative timeframes for improvement rates are based on observations of grazing exclosures and professional judgment of the District soils scientist from experience working in these ecosystems. A soil is considered 'recovered' from previous impacts when it meets all standards and guidelines in the Mt Hood Forest Plan, including detrimental soil condition, adequate effective groundcover, organic matter levels, etc. Damaged streambanks within soil types 3 and 4 have the potential to recover their vegetative cover the fastest due to their inherent high resiliency. The effects of surface soil compaction are probably reversible. Soil porosity would slowly improve, allowing favorable soil conditions necessary for water infiltration and subsequent plant production in the long term. Of the three alternatives, the no grazing alternative would allow soils to recover to a higher level and extent.

**Table 3-25. Summary of Existing Soil Impacts With Improvement Rates**

| Soil Type | Current Grazing Use Patterns (Heavy, Light, None) | Existing Soil Impacts (High, Med, Low) | Soil Resiliency (High, Med, Low) | Estimated Relative Soil Improvement Rate From Current Impacts (If No Grazing) | Priority Areas (see existing condition summary above) |
|---|---|---|---|---|---|
| 3, 4 | Heavy | High | High | Very Quickly | High |
| 8 | Light | Med | Low | Less Quickly | Medium |
| 153 | Light | Med | Low | Less Quickly | Medium |
| 158 | Light | Med | Low | Less Quickly | Medium |
| 162, 163, 210, 211, 212 | None (too steep) | None | Low | N/A | N/A |
| 347, 349 | Light | Low | Med | Quickly | Low |
| 348 | Light | Low | Med | Quickly | Low |

**Action Alternatives**

**Direct and Indirect Effects**

Table 3-26 summarizes the comparison of soil impacts from the two action alternatives. Additional design features such as fencing to exclude cattle from the North Fork Mill Creek drainage and West Fork Neal Creek, water developments, salting locations away from riparian areas, and dispersed turn out locations in the proposed action either lessen the risk of soil damage or exclude livestock from damaged areas to facilitate recovery. Each design feature or group of similar features was evaluated by alternative. Design features involving 'knee knockers' require moving down wood from one location to another (adjacent forested stands with abundant down woody material). Down wood levels will be monitored during implementation to ensure an area does not become depleted in woody debris.

| Table 3-26. Soil Impacts by Alternative | | | | |
|---|---|---|---|---|
| | **Current Management with Slight Modifications** | **Soil Impacts** | **Proposed Action** | **Soil Impacts** |
| **Design Feature** | | | | |
| **# of cow/calf pairs/AUMs** | 52 pair/240 AUMs for 3.5 months currently<br>105 pair/485 AUMs if 2nd permit is re-issued | Soil impacts would continue in the same or similar patterns as they do now, especially in the uplands. Refer to Existing Condition for a full discussion of soil conditions under current management. | 52 pair/240 AUMs for 3.5 months<br>More can be added if resource conditions met up 105 pair/485 AUMs maximum | Possible soil impacts are evaluated in the Adaptive Management process. More AUM's could be added if soil conditions allow. |
| **Turn out location in the spring** | Existing Long Prairie Corral | Soil condition would remain as it is. Impacts would continue as they have, no soil recovery would occur in the Long Prairie riparian area. | Four locations: the 90-degree bend in the 170013, the end of the 1710643, 1710630 1700672<br>Each turn out location would only be used every 2-4 years during the spring. | This would allow for an upward trend in soil recovery and revegetation in the current corral area near West Fork Neal Creek and spread out impacts to non-riparian areas. Also, by rotating turn out locations there would be a very low risk of detrimental soil impacts at any one location. |
| **Gather location in the fall / Corral location** | Existing Long Prairie Corral. If necessary, it would be hardened with geopaper and gravel to protect the site from further trampling. | The immediate corral area is already in poor soil condition. Impacts would continue as they have and the soil condition would remain as it is. No soil recovery would occur in the Long Prairie riparian area. | The new Long Prairie corral site just north of its current location, further from West Fork Neal Creek. | This would allow for an upward trend in soil recovery and revegetation in the current corral area and move any potential impacts from such as compaction and lack of vegetation to another location further upland and away from West Fork Neal Creek. |

| | | | | |
|---|---|---|---|---|
| **Protection of riparian areas in Gibson Prairie area (North Fork Mill Creek)** | Where evidence of streambank trampling exists near the headwaters of North Fork Mill in Gibson Prairie down wood would be placed along riparian area. | This project would reduce the amount of streambank damage occurring annually, and allow an increased amount of soil recovery in the headwaters of North Fork Mill Creek in Gibson Prairie. Direct sediment inputs due to trampling would be lowered, as would the risk of subsequent soil erosion during the non-grazing season. The actual amount of recovery would depend on the effectiveness of the structures. | Where evidence of streambank trampling exists near the headwaters of North Fork Mill in Gibson Prairie (on the north side of the proposed fence), down wood would be placed along riparian area | Same as Alternative 2 |
| **New fence and water guzzler construction** | No new fence or water sources proposed | No additional positive impacts beyond annual maintenance and reconstruction of existing range improvements as part of the annual operating plan. | New northern boundary fence, an east-west fence to restrict cattle from the North Fork Mill Creek drainage (this would include 3 cattleguards).<br>New water source at Horseshoe pond at Forest Road 1710-643.<br>Water piped from Joe's Spring into new proposed corral site.<br>Four salt mineral block locations proposed away from riparian areas | These projects, in addition to annual maintenance and reconstruction of existing range improvements, would afford the most watershed protection by reducing the risk of livestock damage in riparian areas and placing more predictability in annual grazing use patterns. This would allow for virtually full soil recovery within the fenced areas along North Fork Mill Creek. Direct sediment inputs due to trampling would be lowered, as would the risk of soil erosion during the non-grazing season. The actual amount would depend on the overall effectiveness of the structures. |
| **Cumulative Activities – On-going Range Improvements** | | | | |
| | **Project** | **Project** | **Cumulative Soil Impacts** | |
| **Range improvements along riparian areas in the Long Prairie Allotment (West Fork Neal Creek)** | Construction of 150 yards of an east-west fence (just north of the current corrals) that will connect with a fence on the east bank of the West Fork Neal Creek (essentially forming an exclosure) to keep cattle out of the riparian area along West Fork Neal Creek. | A buck and rail fence exclosure at the western-most headwaters fork of West Fork Neal will protect this area from cattle trampling and stream crossings. | These projects would reduce the amount of streambank damage occurring annually, and allow for an increased level of soil recovery immediately adjacent to West Fork Neal Creek in Long Prairie. It would allow for an upward trend in soil recovery and protection and direct sediment inputs due to trampling would be eliminated, as would the risk of soil erosion during the non-grazing season. | |

All of the design features taken together provide a relative comparison of the overall soil impacts found on Table 3.27. The lowest soil impact is from the no grazing alternative. The proposed action addresses the watershed high use areas through additional fencing, corral re-location, salt mineral blocks, and water improvements and thus is given a medium rating. Alternative 2 addresses some of the problems noticed in the high-use areas, but to a lower degree than the proposed action and therefore gets the highest impact rating as compared to the other two alternatives.

**Table 3-27. Relative comparison of soil impacts**

| Alternative | Rating of Soil Impacts |
|---|---|
| No Grazing | Lowest |
| Proposed Action | Medium |
| Current Management with Slight Modifications | Highest |
| | |

**Cumulative Effects**
The analysis area for cumulative effects on soil quality is the permit area.

*Past Actions:*
Detrimental soil conditions caused by past logging projects within the allotment were determined to be limited in extent or have had sufficient time to heal to the point where they were no longer clearly evident (Mill Creek Planning Area Soil Transects). There appears to have been an attempt to construct a pond in upper Gibson Prairie, but the area does not hold water and the disturbed ground has revegetated.

Detrimental soil conditions from old logging projects are within acceptable standards for the two units monitored, although livestock are using the skid trails within the units to move around, which is likely inhibiting at least some soil recovery. Recent logging activity in the West Fork Neal Creek watershed just downstream of the forest boundary may contribute sediment to the creek. However, the area is privately owned and was not surveyed so the amount of cumulative impact is not discernable, just a possibility based on observation.

Current off-road vehicle use and illegal trail construction this past spring has causing soil damage, especially in riparian areas and on steep roadcuts. This is occurring primarily in Gibson Prairie within the upper North Fork Mill watershed. There was difficulty in determining how much streambank damage was caused by livestock and how much from illegal trail building. There appeared to be shovel marks in some places and hoof damage in others along the riparian areas of Gibson Prairie, with some probably obscuring evidence of the other. Removal of one or both of these damaging agents from the immediate streambank area would facilitate vegetative recovery. The existing temporary closure to off-road vehicle use in the area that was put in place in the spring of 2005 has been effective at curbing use and minimizing impacts. There is already evidence of some soil recovery.

*Reasonably Foreseeable Future Actions:*
There are two ongoing, fencing projects in the allotment. The Forest Service, together with the Confederated Tribes of the Warm Springs are constructing 150 yards of an east-west fence (just

north of the current corrals) that will connect with a fence on the east bank of the West Fork Neal Creek (essentially forming an exclosure) to keep cattle out of the riparian area along West Fork Neal Creek. In addition, a buck and rail fence exclosure is being constructed at the western-most headwaters fork of West Fork Neal will protect this area from cattle trampling and stream crossings. Both of these projects will be implemented in September 2005. These projects would reduce the amount of streambank damage occurring annually, and allow for an increased level of soil recovery immediately adjacent to West Fork Neal Creek in Long Prairie. It would allow for an upward trend in soil recovery and protection and direct sediment inputs due to trampling would be eliminated, as would the risk of soil erosion during the non-grazing season.

Apart from the proposed action, range management on the allotment includes annual maintenance and reconstruction of existing range improvements as part of the annual operating plan. (See page 20 for a detailed list of reconstruction projects planned.) Reconstruction and timely maintenance of range improvements such as fences and water guzzlers control livestock movement and keep impacts in sensitive areas (such as riparian) minimized. Soil impacts are moved and dispersed out over time and space. Fencelines and areas immediately adjacent to troughs tend to become trampled but would not be point sources for sediment. Having the listed fences and water sources reconstructed and functioning along with the implementation of the proposed activities would improve soil conditions in those areas where livestock tend to drift and stay in sensitive environmental locations.

Public use of off-road vehicles and the desire to use forest roads is increasing. Increased use of roads leading to access points to operate off-road vehicles would likely result in the need for more maintenance to adequately discharge water, sediment and preserve the road system than is presently needed. This area is currently being considered as part of a forest-wide off-road vehicle plan as part of a separate environmental analysis. At this time it is too speculative in nature to attempt to estimate the effects of that potential designation. If funds and personnel are not available to maintain roads and off-road vehicle trails, then water and sediment discharge from road and trail damage and soil erosion would likely occur. Potential future effects from these cumulative actions could have more impact than the grazing alone. Even if design features and mitigations regarding livestock are effective these other actions may continue to have an impact on soil quality.

# Botany

A more detailed botanical biological evaluation was completed for this analysis. It is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the assessment are summarized below.

## Existing Condition

There are no threatened or endangered species in the project area. Of 71 species that are listed as Forest Service, Pacific Northwest Sensitive Species in range of the Mt. Hood National Forest there is suitable habitat in the range Long Prairie Allotment for 40 species (13 vascular plant species, 4 lichen species, 2 bryophyte species, and 18 fungi). Potential suitable habitats for these species include Long Prairie, Gibson Prairie, Middle Prairie, Gibson Prairie horse camp, wet an dry meadows, all seeps, springs, ponds, streams, swales, rock outcrops and cobbly slopes, pine-oak woodlands, and late successional forested habitats throughout the allotment area.

Surveys have been conducted for 23 species that are known or suspected to occur in the allotment area. Surveys were conducted June through September of 2000, 2001, 2002, 2003, and October 2004.

Two Forest Service, Pacific Northwest Region sensitive plant species occur within the allotment area. One species – *Lomatium watsonii* – occurs directly adjacent to the allotment, near the trailhead for Surveyor's Ridge.

***Arabis sparsiflora var. atrorubens* (Nutt. mss.), Sicklepod rockcress**
In 1990 24 sites of *Arabis sparsiflora var. atrorubens* were documented along Surveyor's Ridge Trail; 8 of the sites are within the allotment area. The number of *A. sparsiflora var. atrorubens individuals* varied at each site at the time they were reported in 1990. The majority of the habitat area is in the steep grassy openings along the edges of the trail, and occasionally at the forest edges adjacent to the trail. The sites were last visited in 1995. It was noted that the species was more prevalent in the loose disturbed soil at the edges of the trail. It was also noted that cattle, horses, and wildlife were obviously using the trail as well as mountain bikes and hikers. The sites along Surveyor's Ridge Trail have not been visited since 1995, and the stability of the populations is unknown at this time. The known site near Surveyor's Ridge Trailhead was visited in 2004 and the population is currently stable.

***Botrychium minganense* Victorin, Mingan moonwort**
In 1990 1 population of *B. minganense* plants was found in section 36 within the allotment area. The site was found on Forest Service land that was later included in the Lensky/Smith land exchange in the early 1990s and is now privately owned. The habitat is in a floodplain with an overstory of western red cedar and an understory of vine maple, mixed shrubs, and skunk cabbage. Monitoring plots were established at the site in 1990 and 23 individuals were tallied. The site was monitored again in 1992 and 35 individuals were tallied. Although monitoring was not conducted again until 1998 the site has been informally observed every other year since 1988. In 1997 the entire cedar forest habitat had been clear cut logged. Only 1 *B. minganense* plant was found under slash debris.

*Long Prairie Pasture*
In 2001 a *B. minganense* site was found in the floodplain near the headwaters of the western fork of the West Fork of Neal Creek in section 11 to the south of Long Prairie. There are 2 subpopulations at the site; 1 of the populations was recorded in 2001 as having 23 *B. minganense* individuals. The other population was recorded in 2002 as having "<60" *B. minganense* individuals. Both populations are within a "high use" area where cows tend to congregate in the late summer. Field reports note damage to habitat and vegetation caused by trampling and grazing cows and native ungulates in the floodplain habitat. Some herbivory of *B. minganense* plants was also noted at both sites. One site was reported to have windthrown trees in the habitat. The sites have not been observed since 2002 and 2003; the condition of the *B. minganense* populations and their habitat is unknown at this time.

*Gibson Prairie Pasture*
In 2002 and 2003, 3 *B. minganense* sites were found in riparian floodplains near the headwaters of North Fork Mill Creek in the south half of section 14. Although the sites were originally

documented as 3 separate populations they are actually associated subpopulations due to their close proximity to each other. The sites are located in a "low use" area of the allotment. The range specialist Dan Fissell has reported that cows typically do not go into the portion of the allotment south of the North Fork of Mill Creek. The sites have not been observed since 2002 and 2003; the condition of the *B. minganense* populations and their habitat is unknown at this time. In 2001, 2 *B. minganense* sites were found in the northeast ¼ of section 12 in a seep area approximately 200 meters southwest of the spring at the headwaters of Mosier Creek. There are 2 subpopulations at the site. The sites are located in a "low use" area of the allotment that is mainly forested habitat. The range specialist Dan Fissell has reported that cows might migrate through that particular portion of the allotment on their way to better forage. The sites have not been observed since 2001; the condition of the *B. minganense* populations and their habitat is unknown at this time.

***Lomatium Watsonii* Coult. & Rose, Watson's desert parsley**
In 1988 a single population of approximately 465 *Lomatium watsonii* individuals was found under the powerlines near the Surveyor's Ridge trailhead. The habitat is a cobbly slope that is sparsely covered with herbaceous vegetation. The population has been observed annually since 1988. There is evidence that cows have been near the habitat area over the years although there has been no evidence of damage to the actual site. The primary impact to the habitat has been caused in the past by off-road vehicles and automobiles parking at the top edge of the habitat. In 1996 boulders were placed between the road and the habitat to deter traffic and have provided effective protection of the site. The site was visited in 2004 and the population is currently stable.

**Fungi Species**
There is habitat for the following fungi species in the Long Prairie Allotment: *Cordyceps capitata, Cortinarius barlowensis, Gomphus kaufmannii, Gyromitra californica, Leucogaster citrinus, Mycena monticola, Otidea smithii, Phaeocollybia attenuata, Phaeocollybia californica, Phaeocollybia olivacea, Phaeocollybia oregonensis, Phaeocollybia picea, Phaeocollybia pseudofestiva, Phaeocollybia scatesiae, Ramaria amaloidea, Ramaria gelatiniaurantia, Sowerbyella rhenana*

## Effects Analysis

**Alternative 1-No Grazing**
**Direct, Indirect, and Cumulative Effects**

***Arabis sparsiflora var. atrorubens* (Nutt. mss.), Sicklepod rockcress**
Under the No Action alternative recreational use of the trail would still be allowed. During site frequent informal site visits conducted prior to 1995 there was observable evidence that Sicklepod rockcress appeared to be thriving in areas where soil had been loosened by gohpers/moles, frost heave, erosion at trail edges and around rock outcrops, etc. It was also been noted that recreational use of the trail by hikers, bikers, horseback riders may have contributed to soil erosion along the edges of the trail. Informal observations also noted that Sicklepod rockcress was not thriving in compacted soils. Compacted soils in habitat areas off the Surveyors Ridge Trail occur around rock outcrops and flat or gently sloping grassy openings that are used as viewpoints by recreationists, and to a lesser degree by trampling caused by animal use.

Surveyor's Ridge Trail also functions as a dispersal corridor for noxious weeds that spread out into grassy openings and compete with Sicklepod rockcress and native plant communities for water and nutrients. Monitoring would be needed to accurately assess the long term effects that various factors might have on Sicklepod rockcress and its habitat along Surveyor's Ridge. Currently assumptions can only be made based on occasional informal observation (which does not incude tally of individual plants) over the past 10 years.

***Botrychium minganense* Victorin, Mingan moonwort**
The absence of cows under the No Action alternative would allow riparian ecosystems and Mingan moonwort habitat in the allotment to respond to natural processes over the long term.

***Lomatium Watsonii* Coult. & Rose, Watson's desert parsley**
Under the No Action alternative recreational use of the area would still continue. Watson's desert parsley and its habitat have been impacted over the years by recreationists using the site as a viewpoint. Soil compaction has occurred as a result which could make it difficult for desert parsley seeds to germinate and existing plants to grow. Boulders have been placed around the site to prevent vehicular traffic but foot traffic still occurs. Monitoring would be needed to determine the long term effects of the potential impacts on Watson's desert parsley and its habitat.

There are noxious weeds encroaching on the site from a nearby grassy area. Although the weeds are pulled annually there is the potential for adverse short and long term effects on Watson's desert parsley, its habitat, and the native plant community; monitoring would be needed to determine the potential long term effects.

Although there have been recreational impacts to the site in the past (compaction, trampling), and potential for noxious weed encroachment, the population appears to have expanded from 100 plants in 1984 to over 450 in 1988. Informal observation of the site on Surveyor's Ridge since 1988 has noted a continued increase in the dominant cover of Watson's desert parsley at the site. Boulders were placed around the sites in 1996 and noxious weeds are pulled annually. Monitoring would be needed to determine the potential cumulative effects related to recreational use and noxious weed encroachment.

**Fungi Species**
The habitat requirements for the fungi listed above appear to be generally mixed conifer late-successional forest. Most of the suitable habitat is present in the Gibson Prairie pasture in the eastern portion "low use" area around North Fork Mill and in the Surveyor's Ridge Late-Successional Reserve. The absence of cows under the No Action Alternative would allow this habitat to respond to natural processes over the long term.

**Alternatives 2 and 3**
**Direct and Indirect Effects**

***Botrychium minganense* Victorin, Mingan moonwort**
*Surveyors Ridge Pasture*
One site (2 subpopulations) has been documented in a "high use" area in a floodplain near the headwaters of the western fork of the West Fork of Neal Creek in section 11 to the south of Long Prairie. The site directly borders the Gibson Prairie pasture. The cattle have a direct, short-term effect on Mingan moonwort as they wallow in its riparian habitat which has been observed to cause a loss of vegetative cover and diversity of riparian associated plants, a decrease in streambank stability, and increased soil erosion and compaction. The riparian corridor habitat downstream to the north has also been directly impacted by cows as they tend to congregate in the "high use" areas during July and August when Mingan moonwort is emerging. There is evidence that cows have been in the habitat area over the years although there is very little baseline data with which to compare population trends for tracking short and long term response of Mingan moonwort to the impact.

*Long Prairie Pasture*
Two *B. minganense* sites were found in the northeast ¼ of section 12 in a seep area approximately 200 meters sw of the spring at the headwaters of Mosier Creek. The area has been reported to have "low to no use" by cattle because of the forested terrain. At the time the sites were reported in 2001 there was no reported evidence of cattle in the habitat area. It can be expected that use of the area by the current permitted cattle would remain "low;" however, there is very little baseline data to compare future population trends for tracking short and long-term response of Mingan moonwort to the potential impacts of cattle. Monitoring is needed to assess short and long-term population trend. (The cumulative effects section addresses an on-going project to exclude potential habitat in Long Prairie from cattle impact.)

*Gibson Prairie Pasture*
Three *B. minganense* sites were found in riparian floodplains near the headwaters of North Fork Mill Creek in the south half of section 14. The area has been reported to have "low use" by cattle. In 2002 and 2003 when the sites were documented it was noted that there was "old" evidence of cows in the habitat area. Both alternative actions propose to place down wood near the headwaters of North Fork Mill Creek near Gibson Prairie if evidence of streambank trampling exists. If the placement of down wood occurs north of the *B. minganense* sites, and if it is effective in keeping the cows out of that particular area, it may have indirect effects on the *B. minganense* population if it caused the cows to move south along the riparian area. If the placement of down wood provides an effective barrier it could also have a beneficial direct effect of creating a microhabitat that may eventually become suitable for B. minganense. Under both action alternatives it can be assumed this *B. minganense* sites would continue to be visited at some point in time by cattle and would receive some degree of impact, however there is very little baseline data to compare population trends for tracking short and long term response of Mingan moonwort to the impact. Monitoring is needed to assess short and long term population trend.

***Arabis sparsiflora var. atrorubens* (Nutt. mss.), Sicklepod rockcress**
The known sites on Surveyor's Ridge are concentrated in a "low use" area of the allotment. Both alternative actions propose use of the pasture, either as part of the current "3 pasture rest rotation" or in the future under the proposed action. There has been no previous evidence to indicate that the occasional presence of cows in the area under the current management has had measurable short or long term effects on Sicklepod rockcress and its habitat. It is expected that there would not be a measurable change of potential short-term effects under actions proposed in Alternatives 2 or 3. Monitoring would be needed to track population trends in response to any potential long term effects.

***Lomatium Watsonii* Coult. & Rose, Watson's desert parsley**
The known sites on Surveyor's Ridge are concentrated in a "low use" area of the allotment. There has been no previous evidence to indicate that the occasional presence of cows in the area has had measurable short or long term effects on Sicklepod rockcress and its habitat. It is expected that there would not be a measurable change of potential short term effects under actions proposed in Alternatives 2 or 3. Monitoring would be needed to track population trends in response to any potential long term effects.

**Fungi Species**
The habitat requirements for the fungi listed above appear to be generally mixed conifer late-successional forest. Most of the suitable habitat is present in the Gibson Prairie pasture in the eastern portion "low use" area around North Fork Mill and in the Surveyor's Ridge Late-Successional Reserve. It has been reported by the range specialist that cattle do not typically use the areas because of steep terrain and lack of forage. The effects of cows migrating through forested habitats in the area could be considered similar to migrational use by native ungulates and would not likely have measurable short or long term effects on fungi.

**Cumulative Effects of Both Action Alternatives**
The cumulative effects analysis area is the allotment area and areas just off the allotment where cattle may drift. Cumulative effects include management of state and private lands surrounding the Mill Creek watershed, particularly to the north of the allotment. Cumulative activities included in this assessment include: past and anticipated logging projects; increased recreation use by mountain bikers and off-road vehicle riders; and, herbivory of species by wildlife.

***Arabis sparsiflora var. atrorubens* (Nutt. mss.), Sicklepod rockcress**
On the Mt. Hood National Forest this species is widely distributed along Surveyor's Ridge Trail from Shellrock to the top of Bald Butte, and along Mill Creek Ridge. There are also several reported sites on the Barlow Ranger District. At least 75% of the known sites are outside of the Long Prairie allotment. Previous informal observations of the Sicklepod rockcress populations indicate that they have remained stable.

The known sites on Surveyors Ridge are concentrated in a "low use" area of the allotment. There has been no evidence to indicate that the occasional presence of cows in the area has measurable cumulative effects on Sicklepod rockcress and its habitat.

Under all alternatives recreational use of the trail would still be allowed. Cumulative effects to the overall population would likely come from impacts related to recreational use of the

Surveyor's Ridge Trail and parking area at the top of Bald Butte. A cumulative loss of habitat could occur around rock outcrops and grassy openings along the trail and on Bald Butte as a result of soil compaction at viewpoints used by recreationists. A cumulative loss of habitat could also occur as noxious weeds spread out into grassy openings and compete with native plant communities for water and nutrients. Monitoring would be needed to determine the measurable cumulative effects of recreation and noxious weed encroachment on Sicklepod rockcress and its habitat.

***Botrychium minganense*** **Victorin, Mingan moonwort**
There are presently only 14 documented sites of Mingan moonwort on the Mt. Hood National Forest and potential suitable habitat is widely distributed across the Forest. Surveys for Mingan moonwort have not been conducted off Forest Service land in the allotment vicinity; the extent of the overall population in the area downstream north of the allotment is unknown at this time. It can be assumed however that Mingan moonwort is likely to be present in suitable habitat downstream from known sites in the allotment.

Under both action alternatives it could be expected that cattle would continue to drift off Forest Service land downstream on previously suitable habitat for Mingan moonwort that was reported on private land in sections 31 and 36. All 3 sites on private lands in sections 31 and 36 were exterpated by clear cut logging in 1998; potential habitat loss by grazing in those areas is not an issue at this time.

Timber harvest could also continue downstream from Mingan moonwort sites on Forest Service land. If riparian areas on lands adjacent to Forest Service are logged in the same manner as those on private land in section 31 and 36, it could have a cumulative effect on the amount of potential suitable habitat that might be available for the species to disperse in our area.

A separate Decision Memo was completed that would relocate the Long Prairie corral and exclude cattle from the headwaters of West Fork Neal Creek with the construction of an exclosure fence. This exclosure fence will be completed in September 2005. The new fence within Long Prairie Pasture will prevent cattle from accessing the stream within the pasture. There are presently no known sites of Mingan moonwort in the area that would be fenced but there is a known site upstream. The fenced area may eventually recover to the point that habitat would become suitable for Mingan moonwort.

The absence of cows under the No Action alternative would allow riparian ecosystems and Mingan moonwort habitat in the allotment to respond to natural processes. As trampled riparian ecosystems recover and begin to function properly, additional suitable habitat for Mingan moonwort may develop over time.

***Lomatium Watsonii*** **Coult. & Rose, Watson's desert parsley**
There is only one known site of Watson's desert parsley on the Mt. Hood National Forest, near Surveyor's Ridge trailhead. There is 1 known site within a ¼ mile of the Forest boundary on Bureau of Land Management land on Mill Creek Ridge. Surveys of potential suitable habitat for this species have not been conducted extensively on across the Mt. Hood National Forest or on adjacent lands.

The site on Surveyor's Ridge is within the "low use" area of Surveyor's Ridge pasture where cows do not typically go unless forage is lacking late in the season in the other portions of the allotment. In previous years there has been some evidence of cows, as well as native ungulates, near the habitat but not in the actual sensitive plant site. There has been no evidence to indicate that the occasional presence of cows in the area has measurable cumulative effects on Watson's desert parsley and its habitat.

Although there have been recreational impacts to the site in the past (compaction, trampling), and potential for noxious weed encroachment, the population appears to have expanded from 100 plants in 1984 to over 450 in 1988. Informal observation of the site on Surveyors Ridge since 1988 has noted a continued increase in the dominant cover of Watson's desert parsley at the site. Boulders were placed around the sites in 1996 and noxious weeds are pulled annually. Monitoring would be needed to determine the potential cumulative effects related to recreational use and noxious weed encroachment.

**Fungi Species**

Extensive surveys for fungi recently added to the R6 Sensitive Species list have not been conducted in the allotment area. Surveys conducted for fungi in other areas of the Mill Creek watershed have not located fungi that were previously listed under Survey and Manage (Northwest Forest Plan). The majority of known sites have been found on the westside of the Mt. Hood National Forest. In the allotment area most of the suitable habitat is present in the Gibson Prairie pasture in the eastern portion "low use" area around North Fork Mill Creek and in the Surveyors Ridge Late- Successional Reserve at the western edge of the allotment. It has been reported by the range specialist that cattle do not typically use the areas because of steep terrain and lack of forage. The effects of cows migrating through forested habitats in the area could be considered similar to migrational use by native ungulates and would not likely have measurable cumulative effects on fungi.

If timber is harvested from late-successional forests on county, state, or private lands that adjoin Forest Service, particularly to the north and west of Surveyor's Ridge Late-Successional Reserve, there could be a cumulative loss of potential suitable habitat for Sensitive fungi in our area.

**Risk Assessment**

***Arabis sparsiflora var. atrorubens* (Nutt. mss.), Sicklepod rockcress**

Sicklepod rockcress is endemic to the Pacific Northwest. According to the 2004 Oregon Natural Heritage Program list of Rare, Threatened, and Endangered Plants of Oregon, the species is currently stable in Oregon. On the Mt. Hood National Forest there are over 20 known sites all on the east side of the Cascade Crest. All of the known sites have been found in open areas that appear to receive some low level of disturbance (trails, roadsides, frostheave zones, etc.) where there is also minimal competing vegetation. In the Long Prairie Allotment the species grows along a trail that is used by hikers, bikers, horseback riders, wildlife, and cattle (although the area is considered to be in a "low use" area of the allotment).

Sicklepod rockcress is an annual/biennial that emerges in early april and goes to seed by late May, all before the cattle are near the area. Without extensive long term monitoring it would be difficult to isolate the exact cause(s) of potential impacts (if any) to Sicklepod rockcress along the ridge because it grows in a multiple use area. Although the species does appear to tolerate a low level of disturbance it can be

expected that there may be some degree of impact associated with Alternatives 2 and 3 and that individuals and habitat might be impacted but it would not likely lead to a loss of viability of the species throughout its range.

### *Botrychium minganense* Victorin, Mingan moonwort

Mingan Moonwort is endemic to northern North America. According to the 2004 Oregon Natural Heritage Program list of Rare, Threatened, and Endangered Plants of Oregon, the species is currently stable in Oregon and throughout its range. On the Mt. Hood National Forest there are 22 known sites most on the east side of the Cascade Crest. All of the sites are within riparian reserves. Some of the sites have been impacted by previous logging and cattle grazing. All of the sites in the Long Prairie Allotment have been impacted by cattle.

Under Alternatives 2 and 3 in the Surveyor's Ridge Pasture and Long Prairie Pasture there would continue to be impacts to known sites in the allootment but it would not likely lead to a loss of viability of the species throughout its range. However, continued impacts to the known sites in the allomen could lead to a loss of individuals and habitat which could eventually lead to a loss of viability of Mingan's moonwort on the Mt. Hood National Forest. Implementation of mitigation measures described on page 20 should reduce the risk of potential future impacts.

Under Alternatives 2 and 3 in the Gibson Prairie Pasture the intallation of a fence that effectively keeps the cattle out of headwaters in the southern half of section 14 would protect Mingan moonwort and its habitat therefor would have a beneficial impact.

### *Lomatium Watsonii* Coult. & Rose, Watson's desert parsley

Watson's desert parsley is endemic to Oregon and Washington. According to the 2004 Oregon Natural Heritage Program list of Rare, Threatened, and Endangered Plants of Oregon, the species is currently threatened in Oregon. The only known site on the Mt. Hood National Forest grows on a bald cobbly slope on Surveyor's Ridge. There is another known site adjacent to the Forest on Bureau of Land Management property on Mill Creek Ridge. Both sites have been impacted by off road vehicles and noxious weeds. The site on Surveyor's Ridge is currently protected behind an arc of large boulders, and the noxious weeds are handpulled annually. There has been no recent evidence of cattle in the habitat area, probably because of its location on the shoulder of a cobbly slope with no forage, water, or shade. The population appears to be stable at this time.

Watson's desert parsley grows from a perennial rootstock. The plant emerges in March and goes to seed by late April, all before the cattle are near the area. Although the site on Surveyors Ridge is considered to be in a "low use" area of the allotment it can be expected that it might receive some degree of impact under Alternatives 2 or 3, but it is not likely to lead to a loss of viability of the species throughout its range. Implementation of mitigation measures described on page 20 should reduce the risk of potential future impacts.

### Fungi

Cattle on the allotment could graze or trample any fungal species present. The risk assessment for 17 fungi species in Alternatives 2 is: *May Impact Individuals or Habitat but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.* One species has a risk assessment of *No Impact to individuals or habitat*. Details of the risk assessment can be found in the botanical biological evaluation in the project file. There are no mitigation measures identified to reduce the risk because potential impacts cannot be avoided and are not expected to be severe.

| Table 3-28. Summary of Botanical Species Risk Assessment | | | | |
|---|---|---|---|---|
| **Vascular Plants** | | | | |
| **Species Name** | **Common Name** | **Species Presence** | **Potential Impact: No Action** | **Potential Impact: Alternatives 2 and 3** |
| **Surveyor's Ridge Pasture** | | | | |
| *Arabis sparsiflora v. atrorubens* | Sicklepod rockcress | Yes | Beneficial Impact | MIIH* |
| *Botrychium minganense* | Moonwort | Yes | Beneficial Impact | MIIH |
| *Lomatium watsonii* | Watson's lomatium | Yes | Beneficial Impact | MIIH |
| **LONG PRAIRIE PASTURE** | | | | |
| *Botrychium minganense* | Moonwort | Yes | Beneficial Impact | MIIH |
| **GIBSON PASTURE** | | | | |
| *Botrychium minganense* | Moonwort | Yes | Beneficial Impact | Beneficial Impact |
| **Bryophytes** | | | | |
| *Rhizomnium nudum* | moss | No | No Impact | No Impact |
| *Schistostega pennata* | Green goblin moss | No | No Impact | No Impact |
| **Lichens** | | | | |
| *Chaenotheca subroscida* | pin lichen | No | No Impact | No Impact |
| *Dermatocarpon luridum* | lichen | No | No Impact | |
| *Leptogium burnetiae var. hirsutum* | jellyskin lichen | No | No Impact | No Impact |
| *Lobaria linita* | lungwort | No | No Impact | No Impact |
| *Nephroma occultum* | lichen | No | No Impact | No impact |
| *Peltigera neckeri* | black saddle lichen | No | No Impact | No Impact |
| **Fungi** | | | | |
| *Cordyceps capitata* | earthtongue | Unknown | No Impact | MIIH |
| *Cortinarius barlowensis* | mushroom | Unknown | No Impact | MIIH |
| *Gomphus kauffmanii* | mushroom | Unknown | No Impact | MIIH |
| *Gyromitra californica* | mushroom | Unknown | No Impact | MIIH |
| *Leucogaster citrinus* | truffle | Unknown | No Impact | MIIH |
| *Otidea smithii* | cup fungi | Unknown | No Impact | MIIH |
| *Phaeocollybia attenuata* | mushroom | Unknown | No Impact | MIIH |
| *Phaeocollybia californica* | mushroom | Unknown | No Impact | MIIH |

| | | | | |
|---|---|---|---|---|
| *Phaeocollybia olivacea* | mushroom | Unknown | No Impact | MIIH |
| *Phaeocollybia oregonensis* | mushroom | Unknown | No Impact | MIIH |
| *Phaeocollybia piceae* | mushroom | Unknown | No Impact | MIIH |
| *Phaeocollybia pseudofestiva* | mushroom | Unknown | No Impact | MIIH |
| *Ramaria amyloidea* | coral fungi | Unknown | No Impact | MIIH |
| *Ramaria gelatiniaurantia* | coral fungi | Unknown | No Impact | MIIH |
| *Sowerbyella rhenana* | cup fungi | Unknown | No Impact | MIIH |
| | | | | |

***MIIH** = May Impact Individuals or Habitat, but will not likely contribute to a trend towards Federal listing or cause loss of viability to the population or species.

# Recreation

## Existing Condition

The Long Prairie area has a diverse number of recreation opportunities. The open timber type and moderate slopes on most of the area provide for one of the few opportunities on the Hood River Ranger district to travel with ease off of maintained roads or trails.

Three trails including Oak Ridge, Surveyor's Ridge, and the North Section Line traverse the area from north to south and east to west. Surveyor's Ridge and Oak Ridge are open to horses, bikes and hikers and are heavily used. The North Section Line Trail is one of the few trails on the Forest where motorized use is permitted, as well as hikers, bikes and horses. Due to the fact that the North Section Line Tail skirts the boundary of The Dalles Municipal Watershed motorized use has been permitted, but not encouraged in recent years to reduce the likelihood of incursions into the watershed.

In the past two years numerous user-created unauthorized trails have been built in the flatter portions of the allotment and used by primarily motorcycle riders. Numerous efforts to close the illegal trails had been made, but the users have continued to open them. In the summer of 2005, a total closure on off-road motorized travel was put in place and the unauthorized trail system was closed and rehabilitated with the use of machinery and a large crew. The closure has been very effective and no more trails have been built to date.

Prior to the area closure to off road travel, the grazing permittee on the Long Prairie Allotment contacted the Hood River Ranger District concerning the illegal trails interfering with the management of his cattle, as the cattle tended to follow the trails. The permittee was also concerned that a motorbike might hit one of the authorized animals.

Also evident on Figure 3-15 is Gibson Prairie Horse Camp that was recently rebuilt by the volunteer efforts of the Backcountry Horsemen, and the Oregon Equestrian Trails Association. The area is increasing in popularity with equestrians and they have requested more trails to ride on.

The local horse, bike, and motorized groups are participating in a collaborative planning process for management of the North Fork Mill Creek watershed and have made recommendations for new system trails to be constructed in the area. The area is also under consideration as a possible

location for expanded motorized trails under the ongoing Mt Hood National Forest Off-Highway Vehicle (OHV) planning process. Both of these proposals are in the early stages of planning and a thorough environmental analysis of the impacts that these new trails would have in the area has not been completed.

Other forms of recreation popular in the area are berry and mushroom picking, firewood gathering, and hunting. The area is in close proximity to the upper Hood River Valley and is used extensively by local citizens.

It is likely that more trails and trailhead parking will be built in the area in the long term to accommodate the demands of the various users, including hiking, horse use, mountain biking, and motorized use although none are proposed at this time. No other campgrounds or other recreation developments are currently envisioned.

Recreation pressure will continue to increase as the population of Hood River and the Portland Metro area increases. In particular, there will most likely be continued pressure from motorized users coming from private timberlands just north of the grazing allotment. Nationally, OHV ownership increased from 2.9 million vehicles in 1993 to 8 million vehicles in 2003 and is continuing to rise (Cordell, Betz, Green Owens, June 2005). The report found that over 22% of people over 16 years of age participate in OHV recreation. A extensive system of user created trails have been built in the last decade on several square miles of lands owned by SDS Lumber and other private owners, as well as those managed by the County of Hood River adjacent to the north of the permit area. The illegal trails built on the National Forest were linked to these trails. SDS has closed its lands to off road motorized travel, but does not have the resources to patrol to control use.

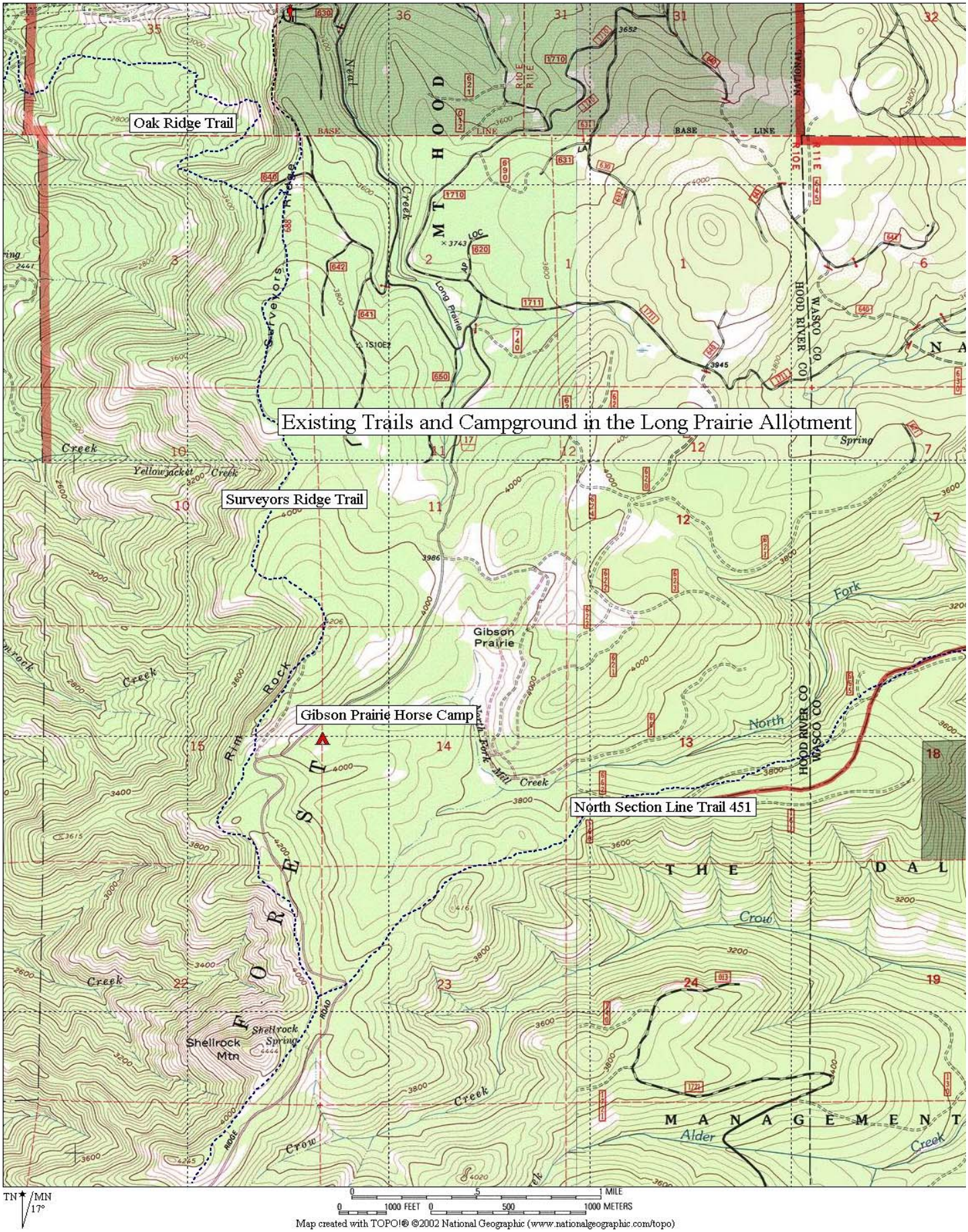


**Figure 3-15. Recreation in the Long Prairie Allotment**

## Effects Analysis

The items that will be analyzed are effects on current trail and dispersed recreation use (such as mushroom and berry picking and hunting), use of the Gibson Prairie Horse Camp and effects on future trail construction opportunities.

**Alternative 1 - No Grazing**

**Direct, Indirect, and Cumulative Effects**

The elimination of cattle grazing would eliminate disturbance to some riparian and meadow areas and may offer some additional opportunities for berry and mushroom hunters. There would be no conflict between current and future trail locations and range management (including cattle movement, fences and other range improvements). Conversely, the permittee would not be using the area and it would be one less knowledgeable person to report any illegal activities (such as unauthorized trail building).

Un-maintained or poorly visible fences pose a credible threat to dispersed cross-country horse and OHV riders. If the allotment were closed and all the fencing removed it would be safer for those users, as well as hikers and hunters. The absence of cattle would eliminate the danger of accidents between motor vehicles and animals on roads and trails. In the experience on this allotment however, no accidents involving fencing or cattle have been reported.

**Alternative 2 – Current Management with Modifications**

**Direct and Indirect Effects**

Under Alternative 2, there may be effects on users of existing trails or dispersed recreation from fences, or from cattle being present in areas that people wish to use for camping or dispersed recreation. Cattle are fenced out of Gibson Prairie Horse Camp, so have no effect on the users there. Some cattle are present on or near trails, but tend not to frequent these areas. Cattle wandering on roads and trails do pose a potential threat to motor vehicles, but no accidents have ever been reported on the allotment. In an extensive search of literature, only one case of documented aggressive behavior exhibited by cattle toward humans was found. In this case people had approached a calf and were head-butted by the cow in a park near San Francisco. There have been no reports of aggressive behavior exhibited by cows on this allotment. In addition, recreationists may encounter allotment fencing while riding a horse, traveling on foot, or on an off-road vehicle. If fencing is not maintained, it could affect the safety of horses if they become tangled in the fence line.

**Alternative 3 – Proposed Action**

**Direct and Indirect Effects**

The proposed action might make more riparian areas more desirable for dispersed uses by fencing cattle out and utilizing more effective rotation. The recreating public would be less likely to encounter cows or areas trampled by cows. Proposed fence lines and improvements may cross existing trail systems, but can be accommodated with gates and/or cattleguards. Cattle are fenced out of Gibson Prairie Horse Camp, so have no effect on the users there. Cow –human and vehicle interaction effects would be the same as in Alternative 2.

**Cumulative Effects of Action Alternatives**
The location of any trails constructed in the future would most likely cross some existing fence lines, which could be mitigated by using gates or cattle guards. As more people are drawn to the areas to recreate with the increase in population, additional dispersed recreation is likely to occur. The potential of motor vehicle accidents is likely to increase, which could be mitigated by signing to make people aware there is open range. Informing the public to not approach calves, or cows with calves in the forest could mitigate the remote possibility of a person being charged by a cow.

# Heritage Resources

A complete heritage resource inventory and assessment of effects report, used for the purpose of consultation with the Oregon State Historic Preservation Officer, is located in the project file at the Hood River Ranger District. The analysis and conclusions of the assessment are summarized below.

## Existing Condition

Reissuing an existing permit for cattle grazing falls within the description of activities determined to have little or no potential to affect cultural resources as determined within the 2004 agreement between the Pacific Northwest Forest Service, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP) (Appendix A.12.a & b). However, areas where cattle may congregate are likely to experience some degree of ground disturbance. Potentially impacted areas within the planning area include meadows, streams, springs, seeps, turnouts, salt mineral blocks, fence lines and corrals. Other areas of impact include proposed range improvements where ground disturbance is involved. A cultural resource survey was conducted for the proposed range improvements and for the areas most likely to be impacted by cattle within the allotment boundary and documented in Heritage Resource Report 2005-060606-0003. Survey methodology was conducted in accordance with the 2004 agreement between Region 6 of the Forest Service, the SHPO, and the ACHP.

There are no designated traditional use areas within the proposed project area. Huckleberries along Forest Road 17 and along Surveyor's Ridge are collected by all segments of the general public.

The Chucker Primary Flake (666NA0020) was initially documented in 1988 as an isolated flake of crypto-crystalline silicate with an indeterminate cultural affiliation. The isolate was later reclassified as a site due to its setting, although no additional cultural materials have been noted in subsequent visits to the site area. The isolated flake could not be relocated; however, the general location of the site was intensively inspected. Cattle do not presently congregate in the area of the site, and the area is in good condition exhibiting no ground disturbance.

The Chucker Obsidian Flake (666NA0021) was initially documented in 1988 as an isolated obsidian flake with an indeterminate cultural affiliation. The isolate was later reclassified as a site due to its setting, although no additional cultural materials have been noted in subsequent visits to the site. The isolated flake could not be relocated; however, the general location of the site was intensively inspected. While there is evidence of cattle and deer trampling within the

general area of the isolate location, cattle do not presently congregate in the general area of the site, and the area is in good condition.

The North Fork Mill Creek Cedars (666NA0045) consists of five to six peeled cedar trees within the Mill Creek drainage. The bark from the cedars was probably formed into baskets for gathering forest products, most likely from within the North Fork Mill Creek drainage. The site is situated within a steep ravine in an area that would not be frequented by cattle and an extremely low likelihood for impacts from cattle. The site was not revisited for this project.

The Surveyors Ridge Lithic Scatter (666NA0090) was documented in 1993 as two or three flakes of crypto-crystalline silicate and a projectile point fragment of petrified wood situated within a roadbed. The site was documented from the recollections of a district employee from observations in the 1980's. The 1993 documentation did not include a site sketch map or precise location for the site. The approximate location of the site was revisited for this project, with no additional cultural materials noted. Cattle do not presently congregate in the general area of the site, and the area is in good condition exhibiting no ground disturbance.

The Long Prairie Ranger Station (666MC0107) consists of the remains of one of the earliest guard stations on the forest, dating to 1902. The site also contains a prehistoric component consisting of a few obsidian flakes, chunks and a projectile point fragment. The site is currently used for corrals and a holding area for cattle. Corrals have been situated in this location for at least 70 years, with various configurations that have changed through time. The soils exhibit extensive and intensive disturbance from animal trampling to depths of up to 20 centimeters. The most intensive disturbance is located in the northwest corner of the corrals, but the entire site area exhibits disturbance from concentrated animal trampling. Shovel probes have revealed cultural materials to depths of 60 centimeters below the ground surface. Continued concentration of livestock in the area could potentially affect undisturbed cultural materials. The corrals are scheduled for relocation in late September 2005. As part of the relocation, a fence will be constructed that will exclude cattle from the site.

The Partial Point and Tertiary Flake (666IS0144) consists of an isolated find of an obsidian projectile point fragment and an obsidian flake with an indeterminate cultural affiliation. The isolated find could not be relocated; however, the general location of the isolate was intensively inspected. Cattle do not presently congregate in the general area of the isolate, and the area is in good condition exhibiting no ground disturbance. Isolates are considered insignificant finds that are ineligible for inclusion on the National Register of Historic Places by the Oregon State Historic Preservation Officer and do not warrant protective measures.

The Long Prairie Cedar (666NA0155) was initially documented in 1993 as a single peeled western red cedar. A revisit to the site for this project revealed three additional peeled cedar trees. The bark from the cedars was probably formed into baskets for gathering forest products probably found in the vicinity of upper Neal Creek. The cedar trees are in good condition and do not exhibit any signs of disturbance from cattle grazing.

The Eastside Phone Line (666IS0156) consists of three segments of telephone wire and two halves of a white porcelain insulator. The telephone line probably provided communication

between the Rimrock Lookout and the Long Prairie Guard Station. Only the telephone wire could be relocated. The phone line was documented as an isolated find. Isolates are considered insignificant finds that are ineligible for inclusion on the National Register of Historic Places by the Oregon State Historic Preservation Officer and do not warrant protective measures.

The Panda Peeled Cedars (666NA0164) consists of four peeled western red cedar trees. The bark from the cedars was probably formed into baskets for gathering forest products within the headwaters of the North Fork of Mill Creek. The site is in good condition and does not exhibit any signs of disturbance from cattle grazing.

The Orphaned Peeled Cedar (666NA0206) consists of a single peeled western red cedar tree. The bark from the cedars was probably formed into baskets for gathering forest products from the area. Attempts to relocate the site were unsuccessful despite intensive investigation on two separate occasions. However, from the inspection of the other peeled cedar tree sites, cattle grazing does not affect this type of site.

The Rimrock Lookout (666EA0230) consists of the remains of the Rimrock Lookout and downed telephone line with scattered insulators. The lookout dates from about 1934 to 1946, and was probably situated to overlook the upper Hood River Valley. The site is located on rocky bluffs and extends into dense forest cover where cattle do not congregate. The site does not exhibit any disturbance from cattle grazing. The heavily utilized Surveyor's Ridge Trail passes through the site area; however, it does not appear that cattle use the trail.

A stand of carved aspen trees (666EA0243) is situated on the edge of a fenced exclosure. Most of the carvings are rendered illegible from age, but are probably associated with 1940's cattle and sheep herding and grazing. Cattle appear to occasionally congregate within the site; however, the trees do not exhibit any signs of disturbance from cattle grazing or rubbing. Cattle trampling does not appear to affect the roots of the trees, as most of the aspen trees are approaching maturity.

**Summary**

Cattle grazing has been occurring within the allotment area since at least 1906. Prehistoric lithic sites 666NA0020, 666NA0021, 666NA0090 are in areas where cattle do not currently congregate and do not exhibit extensive disturbance from cattle grazing. Prehistoric isolate 666IS0144 and historic isolate 666IS0156 are considered insignificant sites not eligible for inclusion in the National Register of Historic Places by the Oregon State Historic Preservation Office and do not warrant protective measures. Peeled cedar tree site 666NA0045 is situated in a steep ravine not frequented by cattle and has an extremely low likelihood to be affected by cattle. Other similar peeled cedar tree sites 666NA0155 and 666NA0164 do not exhibit any disturbance from cattle grazing. While peeled cedar tree site 666NA0206 could not be relocated, it can be assumed that impacts would be similar to those found at other peeled cedar tree sites. The historic lookout site 666EA0230 is situated on rocky outcrops and extends into dense forest where cattle do not congregate, and does not exhibit any damage or disturbance from cattle grazing. Although the carved aspen tree site 666EA0243 is located in an area where cattle occasionally congregate, most of the trees are reaching full maturity and do not exhibit any damage or disturbance from cattle grazing.

Multi-component site 666MC0107 has been used in the past for corrals and as a holding area for cattle. The site exhibits extensive and intensive disturbance from animal trampling.

## Effects Analysis

**Direct and Indirect Effects**
**Alternative 1-No Grazing**
The elimination of grazing under this alternative would also include the removal of permanent structures and improvements related to grazing, such as fences, holding areas, and corrals. The removal of the corrals from the Long Prairie Ranger Station site (666MC0107) would eliminate potential effects to the site from continued ground disturbance from concentrated animal trampling. The eventual revegetation of the area would further protect the site. The Long Prairie Ranger Station site would benefit from Alternative 1.

The remaining sites are unaffected by current management. There would be **no effect** under Alternative 1 to these heritage resources other than the natural processes that are already occurring.

**Alternative 2-Current Management with Slight Modifications**
**Direct and Indirect Effects**
Expected impacts to cultural resources under this alternative would be consistent with impacts observed during the survey and assessment of the existing condition. Cattle grazing does not currently impact the Chucker Primary Flake (666NA0020) site, the Chucker Obsidian Flake (666NA0021) site, the Surveyors Ridge Lithic Scatter (666NA0090) site, the Partial Point and Tertiary Flake (666IS0144) isolate, the Long Prairie Cedar (666NA0155) site, the Panda Peeled Cedars (666NA0164) site, the Orphaned Peeled Cedar (666NA0206) site, the Rimrock Lookout (666EA0230) site, or the Long Prairie Carved Aspen Trees (666EA0243) site. Alternative 2 would have **no effect** on these sites.

The Eastside Phone Line (666IS0156) was documented as an isolated find. Isolates are considered insignificant finds that are ineligible for inclusion on the National Register of Historic Places by the Oregon State Historic Preservation Officer and do not require protective measures. Alternative 2 would have **no effect** on this site.

**Alternative 3-Proposed Action**
Expected impacts to cultural resources under this alternative would be consistent with impacts observed during the survey and assessment of the existing condition. Cattle grazing does not currently impact the Chucker Primary Flake (666NA0020) site, the Chucker Obsidian Flake (666NA0021) site, the Surveyors Ridge Lithic Scatter (666NA0090) site, the Partial Point and Tertiary Flake (666IS0144) isolate, the Long Prairie Cedar (666NA0155) site, the Panda Peeled Cedars (666NA0164) site, the Orphaned Peeled Cedar (666NA0206) site, the Rimrock Lookout (666EA0230) site, or the Long Prairie Carved Aspen Trees (666EA0243) site. Alternative 3 would have **no effect** on these sites.

The Eastside Phone Line (666IS0156) was documented as an isolated find. Isolates are considered insignificant finds that are ineligible for inclusion on the National Register of Historic Places by the Oregon State Historic Preservation Officer and do not require protective measures. Alternative 3 would have **no effect** on this site.

**Cumulative Effects for Action Alternatives**
Corrals and a holding area currently occupy a portion of the Long Prairie Ranger Station (666MC0107) site. The concentration of livestock and horses in the area has disturbed soils to a depth of at least 20 centimeters. Artifacts are known to exist to depths of 60 centimeters below the ground surface. Continued use of the area for concentrating livestock could potentially affect undisturbed cultural materials. The corrals are scheduled for relocation in late September 2005, as part of a separate NEPA decision. Also included in this decision is the construction of a fence that will exclude cattle from the site. Therefore, there are no cumulative effects to the Long Prairie Ranger Station site for either action alternative.

**Consultation with the Oregon State Historic Preservation Officer (SHPO)**
The National Historic Preservation Act requires consideration be given to the potential effect of federal undertakings on historic resources. This includes historic and prehistoric cultural resource sites. The guidelines for assessing effects and for consultation are provided in 36 CFR 800. To implement these guidelines, Region 6 of the Forest Service entered an agreement in 2004 with the Oregon State Historic Preservation Office and the Advisory Council on Historic Preservation. In accordance with the agreement, a survey of the Long Prairie Allotment has been conducted. Based on the results of this survey, a **No Effect** determination has been made for both action alternatives. The SHPO has been consulted as to the determination made and had no objections with this finding.

A cultural resource survey was conducted on a planning area scale and documented in Heritage Resource Report 2005-060606-0003. Survey methodology was conducted in accordance with the 2004 agreement between Region 6 of the Forest Service, SHPO, and the ACHP.

# Social Impact Analysis/Environmental Justice

On February 11, 1994, President Clinton issued the Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898). This order directs agencies to identify and address disproportionately high and adverse human health or environmental effects of projects on certain populations. In accordance with this order, the proposed activities have been reviewed to determine if they would result in disproportionately high and adverse human and environmental effects on minorities and low-income populations.

The communities of Hood River, Parkdale, and Odell are 5 to 20 miles to the west and northwest of the Long Prairie Allotment. Other communities that may have an interest in the allotment area would include Maupin, Madras, Redmond, and Bend to the south and Sandy, Gresham and Portland to the West. Census data confirm that the larger communities have minorities and low-income populations that may be affected by activities on the allotment. However, no specific concerns regarding minorities or low-income populations or communities were identified during the public information process.

The Long Prairie Allotment is located on usual and accustomed land for the Confederated Tribes of the Warm Springs Indian Reservation (as is all of the Mt. Hood National Forest). The Treaty of 1855 granted the Confederated Tribes of the Warm Springs Reservation the right of "usual and accustomed" gathering of traditional native plants and "special interest" use. According to the Ethnographic Study of the Mt. Hood National Forest (French et al, 1995), no traditional use areas have been identified in this planning area. No activities are proposed that would preclude any granted rights.

Although there is no formal tracking system, it is evident to Mt. Hood National Forest front desk staff and special-forest product personnel that many of the foliage/greenery permits on the Forest are sold to low-income individuals and minorities. In the Long Prairie Allotment area, no permits have been sold for any products on a commercial basis. There are only two identified areas on the Hood River Ranger District where commercial harvesters are allowed to harvest any foliage/greenery. The first area is near Wahtum Lake and the second is near Lost Lake. Therefore, the proposal to authorize grazing and implement range improvements would not have any affect on special forest product gatherers.