UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00610 (LAA)
2003/00612 (NLAA)

July 14, 2003

Roger Williams
Forest Supervisor, Malheur National Forest
P.O. Box 909
John Day, OR 97845

Re: Endangered Species Act Section 7 Formal and Informal Consultation and Magnuson-Stevens Fishery Conservation Management Act Essential Fish Habitat Consultation on the Effects of the Malheur National Forest Grazing Program for CY2003, Middle Fork and Upper John Day River Subbasins, Oregon

Dear Mr. Williams:

Enclosed is a document prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to the section 7 of the Endangered Species Act (ESA) on the effects of Malheur National Forest (MNF) Grazing Program for calendar year 2003. NOAA Fisheries concludes in the biological opinion (Opinion) included in this document that the proposed actions are not likely to jeopardize Middle Columbia River (MCR) steelhead (*Onchorynchus mykiss*). As required by section 7 of the ESA, NOAA Fisheries also included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are reasonable and appropriate to minimize the impact of incidental take associated with these actions.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600. The Middle Fork and Upper John Day River subbasins have been designated as EFH for chinook salmon (*O. tshawytscha*).

If you have any questions regarding this consultation please contact Eric Murray of my staff in the Oregon Habitat Branch, at 541.975.1835, ext 222.

Sincerely,

for D. Robert Lohn
Regional Administrator

cc: Marisa Meyer, USFWS
Larry Bright, MNF
Dorthy Mason, BLM
John Morris, BLM
Tim Unterwegner, ODFW

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Malheur National Forest Grazing Program for CY2003

Agency:	U.S. Forest Service
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	July 14, 2003
Issued by:	for D. Robert Lohn Regional Administrator
Refer to:	**2003/00610 (LAA), 2003/00612 (NLAA)**

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1. INTRODUCTION

1.1 Consultation History

On May 19, 2003, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a letter from the Malheur National Forest (MNF) requesting consultation regarding the potential effects of the proposed calendar year (CY) 2003 livestock grazing program on MNF-administered allotments in the Upper John Day River (UJDR) and Middle Fork John Day River (MFJDR) subbasins on Middle Columbia River (MCR) steelhead. The accompanying biological assessment (BA) described proposed livestock grazing actions for 2003 on the Blue Mountain Ranger District (BMRD), Emigrant Creek Ranger District (ECRD), and Prairie City Ranger District (PCRD), as well as the environmental baseline, and the potential effects of those actions on MCR steelhead in the UJDR and MFJDR subbasins within the MNF.

For the past two years, NOAA Fisheries has worked closely with the MNF in an effort to minimize adverse effects of livestock grazing on MNF-administered land on MCR steelhead and their habitat in the UJDR and MFJDR. Numerous meetings were held with the MNF Interagency Level 1 Streamlining Team (Level 1 Team), MNF range staff and biologists, permitees, Tribal and state agencies, and members of the Bureau of Land Management (BLM) National Riparian Service Team. A brief summary of these efforts and meetings is provided below.

During the 2001 grazing season, problems with the administration of the range program on the MNF occurred (U.S. Forest Service 2001). These problems included trespass of cattle and unauthorized use of various allotments or pastures. In addition, utilization standards were not met in several allotments, a situation exacerbated by the relatively dry year. NOAA Fisheries sent a letter dated December 4, 2001, to the MNF asking the Forest to provide an explanation of the unauthorized use or trespass incidents that occurred during the 2001 grazing season. The letter also requested a meeting between the MNF, NOAA Fisheries, and U.S. Fish and Wildlife Service (USFWS) to review the results of 2001 grazing actions.

On February 28 and March 1, 2002, the MNF, NOAA Fisheries, and USFWS met to review the 2001 grazing report, address problems that occurred during the 2001 grazing season, and to develop solutions to avoid these problems in the future. It was agreed during this meeting that NOAA Fisheries and USFWS would work together to develop a monitoring report format to ensure consistency and sufficiency in future MNF annual grazing reports. The MNF also agreed to include information in their 2002 BA indicating how changes in allotment management would address any problems that occurred during the 2001 grazing season. During subsequent meetings, the Level 1 Team worked with the MNF range staff to finalize the monitoring report format. At this time, these groups are working to integrate this monitoring report format with the Interagency Implementation Team (IIT) range monitoring and reporting scheme used throughout the interior Columbia Basin by the U.S. Forest Service and BLM.

During the 2002 grazing season, NOAA Fisheries staff members and MNF range staff members visited MNF grazing allotments to observe in-season grazing. On August 13, 2002, the Long Creek, Fox Cattle and Horse, and Murderers Creek allotments were visited. On August 20, 2002, the Blue Mountain, Lower Middle Fork, and Bear allotments were visited. Observations made during the visits indicated that some riparian areas, particularly those fenced to exclude livestock, were in excellent condition (*e.g.* Granite Boulder Creek) while others, such as areas around Murderers Creek, were in poor condition with excessive use of riparian vegetation apparent. Unauthorized use and trespass were evident in several areas of the UJDR and MFJDR.

On August 20, 2002, NOAA Fisheries received a copy of a letter dated August 12, 2002, sent to grazing permittees from Mike Montgomery (MNF, Blue Mountain District Ranger). The letter emphasized the need for permitees to meet utilization standards despite the abnormally dry conditions the area was experiencing. The letter also stressed the need for the MNF to demonstrate improving riparian conditions and pointed out that during 2000 and 2001, the MNF had the lowest success ratio for meeting utilization standards in the Pacific Northwest Region of the Forest Service.

The yearly MNF end-of-year grazing tour was held October 27-31, 2002. Participating agencies included NOAA Fisheries, the MNF, USFWS, Oregon Department of Fish and Wildlife (ODFW), and the Confederated Tribes of the Warm Springs Indian Reservation of Oregon (CTWS). Several permitees also attended portions of the tour. Mixed results similar to those observed during the mid-season visits were observed during the tour. Riparian areas in some allotments had met standards and were generally in good condition (*e.g.* Fields Peak allotment) while in many riparian areas, utilization standards were not met, bank damage exceeded 20%, and shrubs were heavily browsed (*e.g.* Murderers Creek and Long Creek allotments).

During the tour, several concerns were raised regarding the 2002 MNF range monitoring procedures and the accuracy of the results. Preliminary results presented during the tour did not seem to represent the actual on-the-ground conditions observed in several areas. Currently, the MNF does not have a monitoring protocol to measure bank damage and shrub utilization and there was inconsistency in the manner in which greenline stubble height measurements were taken. NOAA Fisheries and USFWS sent a joint letter to the MNF, dated December 6, 2002, expressing these concerns.

In January 2003, the MNF provided NOAA Fisheries with a December 22, 2002, letter from Prairie City District Ranger Richard Haines to Mike Montgomery and members of the MNF range staff. In the letter, Mr. Haines summarized his observations made during his end-of-year review of allotment conditions on the PCRD. This review was conducted independently by Mr. Haines and was not part of the multi-agency end-of-season tour. The letter stated that although riparian areas in some allotments met standards, many areas were overgrazed and failed to meet standards. Mr. Haines states, “My findings revealed that some of the heaviest utilization I have observed on the District occurred this year”. The letter recommends rest from grazing for resource protection for several pastures.

On June 25, 2003, NOAA Fisheries received an addition to the BA in the form of a proposed action description and effects analysis for two allotments, Deadhorse and Hanscombe, that were not included in the original BA.

On June 30, 2003, NOAA Fisheries received a letter from the MNF requesting review and incorporation of six changes to correct errors discovered in the description of the proposed action in the BA. Attached to the letter were several errata sheets describing the necessary changes to the proposed action. Consultation was initiated on June 30, 2003.

The MCR steelhead (*Oncorhynchus mykiss*) was listed as threatened under the Endangered Species Act (ESA) by NOAA Fisheries on March 25, 1999 (64 FR 14517). NOAA Fisheries applied protective regulations to MCR steelhead under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

The objective of this Opinion is to determine whether the proposed actions are likely to jeopardize the continued existence of MCR steelhead. The objective of EFH consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

1.1.1 2002 Monitoring Report

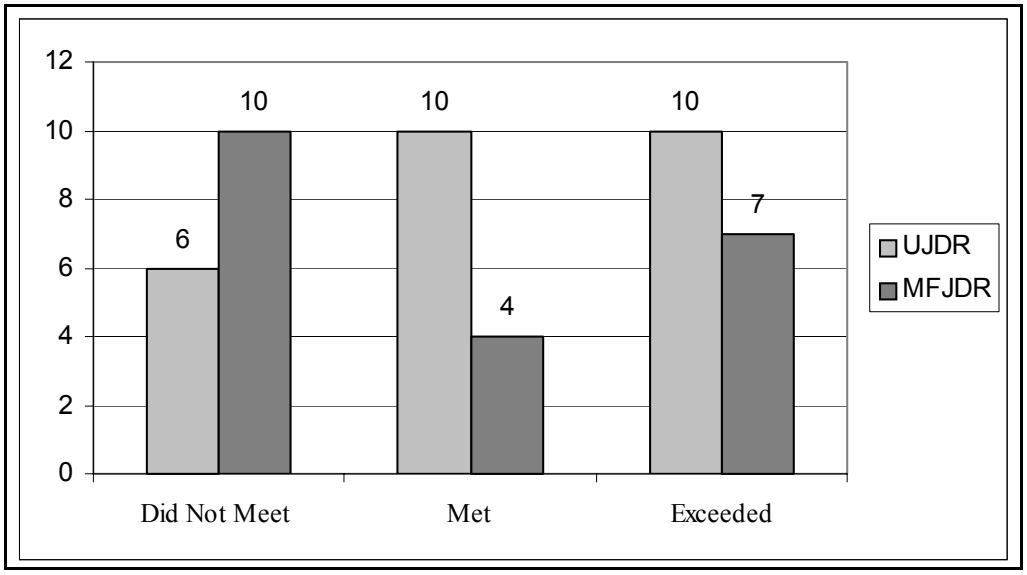
On May 19, 2003, the MNF transmitted the end-of-year monitoring report for grazing in 2002, as required by terms and conditions of the incidental take statement (ITS) found in NOAA Fisheries' biological opinion on the MNF grazing program for fiscal year (FY) 2002 (refer to: 2002/00510). The results found in the monitoring report are summarized in Figure 1. Term and condition 3(e) of the ITS in the FY2002 Opinion required the MNF to develop three habitat restoration plans for areas where livestock grazing was preventing the attainment of riparian management objectives (RMOs)[1]. The MNF developed and began implementing these riparian habitat restoration plans. A portion of Long Creek, located in the Flood Meadows of the Hiyu pasture (Long Creek allotment), is being fenced to protect sensitive streambanks from trampling by livestock.

NOAA Fisheries is concerned about the 16 pastures that did not meet utilization standards during 2002. The MCR steelhead spawning and rearing habitat located on MNF land in the MFJDR and UJDR is essential to the survival and recovery of this species. Damage to streams and riparian areas caused by improper livestock grazing could slow or prevent recovery of riparian resources in these areas.

[1] Riparian Management Objectives (RMOs) - Quantifiable measures of stream and stream-side conditions that define good anadromous fish habitat, and serve as indicators against which attainment, or progress toward attainment, of the (riparian) goals will be measured (USDA and USDI 1995).

NOAA Fisheries is also concerned with the presence of conflicting information in the MNF end-of-year monitoring report. In several places within this report, different monitoring results are presented for the same unit or pasture. For instance, bank damage measurements for the Bear unit of the Dixie allotment was reported as more than 10% by one group conducting monitoring, while another group of MNF staff reported the bank damage as less than 10%. The concern over the accuracy of the end-of-year report is further compounded by information contained in the December 22, 2002, letter from Richard Haines to the MNF range staff, and the observations made by NOAA Fisheries staff during field visits indicating that conditions on the ground may not be reflected by some of the information presented in this report. NOAA Fisheries believes that accurate and consistent monitoring and reporting are essential to ensure that take of MCR steelhead resulting from livestock grazing on the MNF is avoided or minimized.

Figure 1. Number of Pastures/Units Meeting[1], Not Meeting[2], or Exceeding[3] Utilization Standards for Livestock Grazing on the MNF During FY2002



[1]"Meeting standards" means residual stubble height was at utilization levels, bank damage was less than 10%, and shrub utilization was light to moderate.
[2]"Did Not meet standards" means residual stubble height was below the standard, and/or bank damage was greater than 10%, and/or shrub utilization was more than moderate.
[3]"Excceded standards" means residual stubble height standards were above standards bank damage was less than 10%, and shrub utilization was light to moderate.

1.2 Proposed Action

1.2.1 Livestock Grazing

The BA submitted to NOAA Fisheries on May 19, 2003, describes proposed livestock grazing activities for 2003 on 10 allotments in the MFJDR subbasin on the BMRD, 18 allotments in the

UJDR subbasin on the BMRD, three allotments in the UJDR on the ECRD, and five allotments in the UJDR on the PCRD. The BA provided proposed use dates, livestock numbers, and the location of each allotment. A summary of allotment information is found in Table 1.

Table 1. Location, Proposed Use Dates, Proposed Use Numbers, and Effects Determination for MNF Grazing Allotments, 2003

Allotment	Subbasin	Ranger District	Proposed Use Dates[1]	Proposed Use Numbers Cow/Calf Pairs[2]	MNF's Determination of Effect on MCR Steelhead[3]
Balance	MFJDR	BMRD	June 1-October 30	50	NLAA
Bear	MFJDR	BMRD	June 1-October 15	84	NLAA
Camp Creek	MFJDR	BMRD	June 1-October 30	50	NLAA
Keeney Meadows	MFJDR	BMRD	July 1-August 31	57	NLAA
Long Creek	MFJDR	BMRD	June 1-October 15	818	LAA
Lower Middle Fork	MFJDR	BMRD	June1-October 15	364	**LAA**
Slide Creek	MFJDR	BMRD	June 1-October 15	777	NLAA
Upper Middle Fork	MFJDR	BMRD	July 16-August 15	440	LAA
War Canyon	MFJDR	BMRD	June 5-August 5	32	NLAA
York	MFJDR	BMRD	June 1-October 31	62	NLAA
Aldrich	UJDR	BMRD	May 15-September 1	100	NLAA
Dead Horse	UJDR	BMRD	July 15-October 5	175	NLAA
Dixie	UJDR	BMRD	June 1-October 15	300	LAA
Fawn Springs	UJDR	BMRD	May 24-October 30	110	NLAA
Ferg	UJDR	BMRD	August 1-November 27	80	NLAA
Hanscombe	UJDR	BMRD	July 15-October 15	121	NLAA
Joaquin & Williams	UJDR	BMRD	May 15-November 15	3 + 20 horses	NLAA
Justice	UJDR	BMRD	June 12-July 12	80	NLAA
Lewis, Frenchy & Poison	UJDR	BMRD	May 1-November 15	63	NLAA

Allotment	Subbasin	Ranger District	Proposed Use Dates[1]	Proposed Use Numbers Cow/Calf Pairs[2]	MNF's Determination of Effect on MCR Steelhead[3]
McClellan	UJDR	BMRD	September 1-October 15	96	NLAA
Mt. Vernon/JD/Beech	UJDR	BMRD	May 15-November 30	531	LAA
Murderers Creek	UJDR	BMRD	July 12 -October 17	845	LAA
Rosebud	UJDR	BMRD	June 1-September 21	87	**LAA**
Roundtop	UJDR	BMRD	June 1-September 30	100	NLAA
Seneca	UJDR	BMRD	June 15-October 30	321	NLAA
Smoky	UJDR	BMRD	June 1-September 30	95	NLAA
Snowshoe	UJDR	BMRD	June 1-October 5	100	NLAA
Sugarloaf	UJDR	BMRD	June 15-October 15	355	**LAA**
Izee	UJDR	ECRD	June 1-September 9	345	NLAA
Lonesome	UJDR	ECRD	June 1-September 9	510	NLAA
Sawtooth	UJDR	ECRD	August 13-September 30	308	NLAA
Deardorf	UJDR	PCRD	July 6-October 20	100	NLAA
Hot Springs	UJDR	PCRD	May 20-October 15	110	NLAA
Rail Creek	UJDR	PCRD	August 1-September 30	50	NLAA
Reynolds Creek	UJDR	PCRD	July 5-September 18	166	NLAA
Indian Creek	UJDR	PCRD	August 1-September 30	75	NLAA

[1] Proposed use dates may vary by five days at either end of the proposed use period, depending on allotment conditions. The total number of days on the allotment will not vary. For instance, if the allotment is used five days early, the off date will also be five days earlier. Dates designed to protect spawning MCR steelhead are not subject to change.

[2] Proposed numbers represent the maximum number of livestock on the allotment during the year. The permittee or MNF may decide to reduce numbers at any time during the grazing season.

[3] Determinations in bold were changed from the determination made in 2002

1.2.2 NLAA Allotments

In the BA, the MNF determined that activities on 28 of the 36 livestock grazing allotments for the 2003 grazing season are "may affect, but not likely to adversely affect" (NLAA) actions regarding MCR steelhead. Rationale for these determinations made by the MNF are included in Table 2.

Table 2. Rationale for NLAA Determinations on MNF Grazing Allotments for 2003 Grazing Season

Allotment Name	Watershed (5th Field HUC)	Rationale for NLAA Determination
Blue Mountain Ranger District		
Balance	Balance Creek	No spawning habitat on MNF land. Utilization controlled by fencing, salting, and herding. Bank stability >89%. Habitat indicators will be maintained. The Grazing Implementation Monitoring Module (USDA Forest Service and USDI Bureau of Land Management, 2000) will be implemented; monitoring will focus on the riparian areas in Balance Creek.
Bear	MFJDR	On C-1 and C-2 pastures prior to July 15, increased monitoring used to keep livestock off streambanks. Level 1 monitoring will include weekly checks for use along streambanks during grazing periods. Electric fence will be constructed if redds present. On remaining pastures, no grazing adjacent to steelhead streams before July 15. The Grazing Implementation Monitoring Module will be implemented.
Camp Creek	Camp Creek	Move triggers monitored; herding, salt, season changes, fence maintenance, and water troughs to protect riparian zones. Bank stability >90%. Habitat indicators will be maintained. Prior to turnout of livestock, streams in the allotment will be surveyed for steelhead spawning activity. The Grazing Implementation Monitoring Module will be implemented; 40% on Category 1 pastures and 10% on Category 2 pastures.
Keeney Meadows	SF Long Creek	No known fish-bearing streams. Current conditions will be maintained or improved. The Grazing Implementation Monitoring Module will be implemented.
Slide Creek	Slide Creek	Bank stability at 82-98%. During steelhead spawning, Sale pasture will be fenced to avoid cattle interaction with spawning adult steelhead or redds which may be present. The Grazing Implementation Monitoring Module will be implemented; Jungle Creek, Bear Creek, Whiskey Creek, Slide Creek, and Rice Creek riparian areas will be monitored. Whiskey Creek will be surveyed to determine the level of steelhead spawning occuring.
War Canyon	SF Long Creek	No fish-bearing streams. Current conditions will be maintained. The Grazing Implementation Monitoring Module will be implemented; areas that best represent typical utilization within the allotment will also be monitored.

Allotment Name	Watershed (5th Field HUC)	Rationale for NLAA Determination
York On/Off	Slide Creek	No steelhead habitat in pastures to be used before July 15. Current conditions will be maintained. The Grazing Implementation Monitoring Module will be implemented; the focus of monitoring will be the York riparian areas.
Aldrich	Murderers Creek	No steelhead spawning habitat on MNF land; all habitat indicators maintained or improved.
Dead Horse	Mt. Vernon	No grazing prior to July 15; all habitat indicators maintained or improved.
Fawn Springs	Canyon Creek	No steelhead spawning habitat in East Fork Canyon or Wall Creeks on allotment (May 2, 2000, MNF survey)[2]; all habitat indicators maintained or improved.
Ferg On/Off	Beech Creek	No perennial streams on MNF in this allotment.
Hanscomb	Mt. Vernon	Water diversions on private land downstream from MNF prevent access to that portion of Laycock Creek on allotment; no grazing until after July 15; all habitat indicators maintained or improved.
Joaquin & Williams	Canyon Creek	No streams on MNF in this allotment. No steelhead spawning or rearing habitat in East Fork Canyon or Wall Creeks on allotment (May 2, 2000, MNF survey)[1]; all habitat indicators at least maintained.
Justice	Beech Creek	No steelhead spawning habitat on allotment; fence excludes livestock from upper Beech Creek; all habitat indicators maintained or improved.
Lewis Creek, Frenchy & Poison	Upper South Fork & Middle South Fork	Located upstream from Izee Falls (an anadromous fish barrier) on SFJDR; no streams on MNF portion of allotment.
McClellan	Mt. Vernon	Water diversions on private land downstream from MNF prevent access by MCR steelhead to that portion of McClellan Creek on allotment; all habitat indicators at least maintained.
Roundtop	Beech Creek/ Prairie City	Pastures containing steelhead spawning habitat will not be entered until after July 15; all habitat indicators at least maintained.
Seneca	Canyon Creek	All but 0.25 mile of Vance Creek is fenced to exclude cattle; surveys conducted on five occasions during 2000 found that cattle did not use that portion of Vance Creek because of dense brush and lack of palatable herbaceous vegetation.
Smokey	Upper South Fork	Located approximately 20 stream miles upstream from Izee Falls (an anadromous fish barrier) on the SFJDR; streams on allotment are small and contribute very little water to SFJDR; no measurable downstream impacts.

[2] MCR steelhead spawning habitat surveys conducted by Perry Edwards and Tom Mendenhall, fishery biologists.

Allotment Name	Watershed (5th Field HUC)	Rationale for NLAA Determination
Snowshoe	Upper South Fork	Located approximately 20 stream miles upstream from Izee Falls (an anadromous fish barrier) on the SFJDR; streams on allotment are small and contribute very little water to SFJDR; no measurable downstream impacts.
Emigrant Creek Ranger District		
Sawtooth	Upper South Fork	Located approximately 25 stream miles upstream from Izee Falls (an anadromous fish barrier) on the SFJDR; a portion of Sunflower Pasture is only part of allotment within SFJDR drainage; streams on allotment are small and contribute very little water to SFJDR; no measurable downstream impacts.
Lonesome	Upper South Fork	Located approximately 15 to 17 stream miles upstream from Izee Falls (an anadromous fish barrier) on the SFJDR; streams on allotment are small and contribute very little water to SFJDR; no measurable downstream impacts.
Izee	Upper South Fork	Located approximately 17 stream miles upstream from Izee Falls (an anadromous fish barrier) on the SFJDR; streams on allotment are small and contribute very little water to SFJDR; no measurable downstream impacts.
Prairie City Ranger District		
Deardorff	Upper John Day	Cattle would be turned out on July 6 but would be excluded from steelhead spawning habitat until after July 15; all habitat indicators maintained or improved.
Hot Springs	Upper John Day	Cattle will not be turned out in the Hot Springs Pasture, which is the only one that contains steelhead spawning habitat, until July 15; all habitat indicators maintained or improved.
Rail Creek	Upper John Day	Cattle will not be turned out in the allotment until August 1; all habitat indicators maintained or improved.
Reynolds Creek	Upper John Day	MNF will conduct unauthorized use monitoring, mid-season monitoring, and frequent meetings with the permitees to ensure proper allotment management occurs.
Indian Creek	Upper John Day	No MCR steelhead streams in this allotment.

NOAA Fisheries concurs with MNF's NLAA determination for the 28 allotments listed in Table 2, with concurrence based on the rationale summarized in the table. In addition, some of the MCR steelhead habitat indicators such as bank stability, sediment, and width-to-depth ratios are improving under the current grazing practices. Other habitat indicators, not affected by grazing directly, such as road density, will be maintained by the proposed grazing system. This Opinion serves as the NOAA Fisheries concurrence on the MNF-determined NLAA allotments, these NLAA allotments are not analyzed in any further detail. The LAA allotments will be analyzed in further detail in this document.

The Herberger, McCullough, Austin, Sullens, Fields Peak, and Blue Mountain allotments on the MNF will be rested in 2003, and were, therefore, determined by the MNF to have "no effect" on MCR steelhead, and are therefore not part of this consultation.

Eight range allotments (Long Creek, Upper Middle Fork, Murderers Creek, Lower Middle Fork, Dixie, Mt.Vernon/John Day/Beech Creek, Rosebud and Sugarloaf) on the BMRD were determined by the MNF to be LAA MCR steelhead. The grazing activities on these allotments will be analyzed in detail in this Opinion.

1.2.3 Monitoring and Establishing Utilization Standards

On April 14, 2000, a USFS/BLM memorandum transmitted the "Interagency Implementation Team (IIT) 2000 Grazing Implementation Monitoring Module" to the MNF and other National Forests and BLM districts in Oregon. The MNF conducted implementation monitoring in 2001, as directed in the module, on MNF-administered allotments in the UJDR and MFJDR subbasins. The IIT grazing module was altered in 2002. The altered module provided further clarification on where monitoring should occur and how many units should be sampled each year. Areas where monitoring will be focused are described for each allotment.

The MNF is within the area covered by PACFISH (USDA and USDI 1994). All agency activities in this area are required to be consistent with their Land and Resource Management Plan (LRMP) as modified by PACFISH. The broad scale consultation for MCR steelhead on the MNF's land and resource management plan is currently incomplete. As a result, the NOAA Fisheries' 2001 and 2002 biological opinions on MNF grazing allotments required in term and condition 2(a) that grazing activities must be consistent with the requirements of NOAA Fisheries' June 22, 1998, Opinion, "Section 7 Consultation on the Effects of Continued Implementation of Land and Resource Management Plans on Endangered Species Act Listed Salmon and Steelhead in the Upper Columbia and Snake River Basins" (NOAA Fisheries 1998).

Land management agencies such as the Forest Service and BLM establish utilization standards for livestock grazing in riparian areas. These standards provide "move triggers" for permitees as well as means to gauge the effects of grazing on RMOs. Typically, herbaceous residual stubble height is used as a standard to measure the utilization of riparian forage. In addition to residual stubble height, shrub utilization and bank damage estimates are also used as utilization standards. Permitees are instructed by land management agencies to move livestock when thresholds for utilization standards are approached or reached. Typically, stubble height utilization standards are set between four and six inches of residual stubble height. This means that as grazing in riparian areas begins to result in 4 to 6 inches of remaining herbaceous stubble height, livestock are moved to another unit or pasture. Sometimes stubble height measurements are taken on the most palatable species such as Kentucky bluegrass. Other times, hydric vegetation such as sedges and rushes growing along the streambank are measured.

The MNF uses the IIT protocol to measure stubble height of hydric vegetation present in the "greenline" adjacent to the stream's edge. Hall and Bryant (1995) state that as stubble height of

the most palatable species reaches three inches, it should be assumed that unacceptable grazing use in riparian areas will begin. It should be pointed out that Hall and Bryant's method relies on measuring stubble height of the most palatable species, while the "move trigger monitoring" and the IIT protocol used by the land management agencies relies on stubble height measurements of hydric vegetation such as sedges and rushes. These plants are typically less palatable to livestock. For this reason, directly applying Hall and Bryant's three-inch standard to monitoring stubble height of hydric vegetation is not appropriate. Normally, when hydric vegetation is measured, standards are set at between four and six inches.

When land management agencies formulate residual stubble height standards for units or pastures within a grazing allotment, two primary factors are considered. The first factor is the hydrologic function of the vegetation. Herbaceous vegetation plays an important role in maintaining and building streambanks. Stems of herbaceous vegetation slow stream current velocity during high flow events and facilitate sediment deposition, a process essential to the building of streambanks. Roots of herbaceous vegetation stabilize the soil and prevent erosion during high flow events. A study by Clary *et al.* (1996) found that in a simulated channel, residual stubble heights of 0.5 to 6 inches of flexible vegetation supported streambank rebuilding process within a single sediment loading and flushing. They also found that under multiple loading and flushing events, 8 to 12 inches of residual stubble height also entrapped and stabilized significant amounts of sediment.

The second factor considered when determining stubble height standards is the contribution the residual vegetation makes to healthy riparian habitat. Herbaceous vegetation provides many important functions in a healthy riparian ecosystem. Overhanging grasses, sedges, and rushes provide shade to the stream and hiding cover for fish. In meadow systems, herbaceous vegetation may be the only shade providing plants. Overhanging herbaceous vegetation can also provide valuable overwintering habitat for juvenile salmonids. The presence of a healthy community of hydric vegetation in headwater wetland areas of watersheds also plays an important role in maintaining streamflow. The roots of this vegetation wick moisture into the soil during wet periods in the spring, maintaining a high water table. This water is then released gradually throughout the summer and fall, maintaining adequate streamflow during critical periods for juvenile salmonid growth and survival.

In grazed riparian systems, the presence of herbaceous vegetation prevents livestock from browsing hardwood shrubs. Clary and Leininger (2000) provide guidelines for establishing stubble height standards to avoid livestock browsing on hardwood shrubs but point out that residual stubble heights necessary to avoid browsing on shrubs depend on many factors, and can vary between 10 and 20 cm (approximately 4 to 8 inches).

Considering these two factors, land management agencies establish residual stubble height utilization standards for each unit or pasture. As previously mentioned, the standard is typically 4 to 6 inches of residual stubble height. Clary and Leininger (2000) suggest starting with a 10 cm (approximately 4 inches) stubble height standard and then monitoring the area to determine if a change needs to be made to improve riparian conditions. They also state that in certain areas,

15 to 20 cm (approximately 6 to 8 inches) of residual stubble height may be needed to protect streambanks sensitive to trampling or protect riparian shrubs from browsing. For the allotments addressed in this Opinion, residual stubble height standards have been set by the MNF to between 4 and 6 inches.

1.3 Proposed Action Descriptions on LAA Allotments

1.3.1 Long Creek Allotment

The proposed action for the Long Creek Allotment is to graze 818 cow/calf pairs from June 1 to approximately July 15. Forage utilization in the pastures will not exceed a 4-inch stubble height or 45% utilization standard. Allowable utilization on the riparian greenline will be 4 inches unless otherwise stated. The streambanks will not exhibit greater than 10% damage, and riparian shrubs will not exhibit more than light to moderate browsing as a result of cattle grazing. Livestock will be moved when any of these standards is approached. Table 3 describes the proposed rotation of cattle.

Table 3. Proposed Grazing Schedule, Utilization Standards, and MCR Steelhead Streams for Pastures in the Long Creek Allotment for the 2003 Grazing Season.

Unit	# of livestock	Grazing dates*	End-of-season utilization standard	MCR steelhead streams
Flat Camp	818 pairs & riders' horses	June 1-July 15	4-inch stubble,	Long Creek, Cottonwood Creek, Camp Creek,
Lick Creek	818 pairs	July 16-August 21	4-inch stubble, <10% bank damage	Trail Creek, Cougar Creek, W. Fk. Lick Creek, Lick Creek, Camp Creek
Hiyu	818 pairs	August 22- October 15	4-inch stubble, <10% bank damage, light to moderate shrub utilization	Long Creek, Coxie Creek, Big Rock Creek, Deep Creek, Sulphur Creek, Jugow Creek,
Ladd	818 pairs	gather after July 15	4-inch stubble, <10% bank damage	Camp Creek,
Camp Riparian	818 pairs	gather after July 15	4-inch stubble, <10% bank damage	Camp Creek
Keeney Meadows	818 pairs	concurrent w/ Hiyu	4-inch stubble, light to moderate hedging on shrub	none
Lick Riparian	818 pairs	gather after July 15	4-inch stubble, <10% bank damage	Lick Creek

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

Protective measures will include:

- PACFISH/INFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the allotment. Additionally, the allotment will be managed to meet RMOs.

- Herding, salt placement, and fence, trough, and stock pond maintenance will aid in keeping livestock away from critical riparian areas.

- Pasture rotation and utilization standards are designed to minimize the impacts of grazing on listed MCR steelhead. They also aid in minimizing impacts to riparian habitats which are essential to maintaining instream habitat quality for salmonids.

- Existing riparian fencing along Camp Creek keeps cattle away from spawning areas for MCR steelhead.

- The portion of Long Creek that flows through Flood Meadows will be fenced to protect streambanks.

IIT monitoring will take place in selected pastures to ensure compliance with PACFISH requirements. Emphasis will be placed in the designated monitoring areas (DMA) identified by MNF personnel in the following riparian areas that are critical to steelhead rearing and survival: (1) Cottonwood Creek, (2) Whiskey Creek, (3) Lick Creek, (4) West Fork Lick Creek, (5) Cougar Creek, (6) Sulphur Creek, (7) Deep Creek, (8) Big Rock Creek, (9) Long Creek, (10) South Fork Long Creek, and (11) Camp Creek.

1.3.2 Lower Middle Fork Allotment

The Lower Middle Fork Allotment will be grazed by three separate permittees with various numbers of cow/calf pairs. Table 4 describes the rotation of cattle on this allotment. The Balance pasture will be run separately from the other, smaller herd. The cattle will be turned onto the Balance pasture first. As the utilization standard is approached the gate between the Sunshine and Balance pastures will be opened and the livestock will be allowed to "drift" into the Sunshine pasture. After one week, the remaining cattle will be driven into the Sunshine Pasture.

The smaller herd will enter Pizer pasture first. There are steelhead in Big Creek on this pasture and the turn-on date is during spawning and emergence. The reduction in livestock numbers, operator "vigilance," and the MNF personnel's attention will keep livestock out of Big Creek. A 6-inch stubble height will be the utilization standard in this pasture.

Table 4. Proposed Pasture Rotation, Utilization Standards, and MCR Steelhead Streams in the Lower Middle Fork Allotment on the MNF for the 2003 Grazing Season

Unit	# of livestock	Grazing dates*	End-of-season utilization standard	MCR steelhead streams
Balance	105 pairs	June 1-July 31	4-inch stubble height	Coyote Creek
Sunshine	105 pairs	August 1-October 30	4-inch stubble height	E. Fk. Big Creek, Lost Creek,
Pizer	50 pairs	June 1- August 1	6-inch stubble height on Big Creek	E. Fk. Big Creek, Lost Creek,
Chicken House	50 pairs	August 2-October 15	4-inch stubble height	E. Fk. Big Creek, Lost Creek,
Hunters Meadow	gathering		4-inch stubble height	
Granite Boulder & Susanville	209 pairs	June 1- October 15	4-inch stubble height	Granite Boulder Creek, Beaver Creek, Dry Creek, Wray Creek, Badger Creek, Myrtle Creek, Deep Creek, Elk Creek, Coyote Creek,

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

Protective measures will include:

- PACFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the allotment. Additionally the allotment will be managed to meet Riparian Management Objectives.

- Herding, salt placement, and fence, trough, and stock pond maintenance will aid in keeping livestock away from critical riparian areas.

- Pasture rotation and utilization standards are designed to minimize the impacts of grazing on listed MCR steelhead. They also aid in minimizing impacts to riparian habitats which are essential to maintaining instream habitat quality for salmonids.

- A grazing system that will meet the limitations of the Summit Grazing EIS (citation) and 1998 MNF protocol for the proposed and listed species will be implemented.

- Temporary fence will be used to restrict areas of grazing.

Monitoring will include:

1. Permittees will be responsible for monitoring indicators and meeting end of season utilization standards.

2. IIT monitoring in selected pastures to ensure compliance with PACFISH requirements.

3. A concerted effort will be made by the MNF to monitor areas that were part of the Summit Fire. Concerns and changes will be documented to refine the grazing strategy to protect RHCA's meet RMOs and assure compliance with PACFISH standards and guidelines.

1.3.3 Murderers Creek Allotment

The Murderers Creek Allotment will be grazed under two separate permits with three separate herds. The North Herd is grazed under one permit with 275 cow/calf pairs from July 16 to October 15. The Middle Herd and South Herd are grazed under one permit. The Middle Herd and South Herd will graze 220 cow/calf pairs and 350 cow/calf pairs, respectively. The Middle Herd will graze from July 16 to September 30. The South Herd will graze from July 12 to October 17. End-of-season utilization standards for the allotment will be 4 inches of residual stubble, light to moderate browsing of shrubs, and less than 10% bank damage. The pasture rotations and management are described in Table 5.

Protective measures will include:

- PACFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the allotment. Additionally, the allotment will be managed to meet Riparian Management Objectives.

- Herding, salt placement, and fence, trough, and stock pond maintenance will aid in keeping livestock away from critical riparian areas.

- Pasture rotation and utilization standards are designed to minimize the impacts of grazing on listed MCR steelhead. They also aid in minimizing impacts to riparian habitats which are essential to maintaining instream habitat quality for salmonids.

Table 5. Proposed Grazing Schedule, Utilization Standards, and MCR Steelhead Streams for Pastures in the Murderers Creek Allotment for the 2003 Grazing Season.

Unit	Grazing dates*	End-of-season utilization standards	MCR steelhead streams
North Herd (275 pair)			
Oregon Mine	July 16- August 20	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Murderers Creek
Dan's Creek	August 21-September 10	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Murderers Creek
Martin Corrals	September 11-October 15	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Duncan Creek, Thorn Creek, Murderers Creek,
Red Rocks	September 11-October 15	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Duncan Creek
Middle Herd (220 pair)			
Timber Mountain	July 16-August 4	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Crazy Creek, S. Fk. Murderers Creek
Horse Mountain	August 25-September 23	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	S. Fk. Murderers Creek
John Young Meadow	August 24-September 4	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	S. Fk. Murderers Creek
Lucera	September 5-19	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	none
Blue Ridge	September 20-30	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	S. Fk. Murderers Creek
Maggot Springs	Gathering October 1-5	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	none
South Herd (350 pair)			
Frenchy Butte	July 12-August 23	4-inch stubble ht., light-moderate shrub utilization, <10%bank damage	Deer Creek, Buck Creek, Vester Creek
Deer Creek	August 24-October 10	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Deer Creek, Buck Creek, Corral Creek, S. Fk. Deer Creek, N. Fk. Deer Creek, Dead Injun Creek, Vester Creek
John Young Meadow	October 11-17	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	S. Fk. Murderers Creek

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

North Herd

- Cattle will be herded onto the MNF from the Murderers Creek Ranch onto the Aldrich Allotment for six weeks prior to entering the Oregon Mine Unit of the Murderers Creek Allotment. Cattle will be held in the uplands by frequent riding (minimum of three days/week) and salting.

- An electric fence will be placed around the riparian meadow and Thorn Creek along the MNF 2170 road as a precaution for stragglers.

- Cattle will not be allowed to concentrate upstream of the Oregon Mine Campground.

- Cattle will be moved when any utilization standard has been met.

Middle Herd

- Cattle will be turned out in the northwest corner of the Timber Mountain Unit and not allowed to trail down Crazy Creek to the South Fork Murderers Creek. Riders will check South Fork Murderers Creek (minimum 3 times/week). The permittee has the option of installing fence to prevent cattle from accessing Crazy Creek and South Fork Murderers Creek.

- The South Fork of Murderers Creek will not be grazed prior to July 15.

- The permittee will have 72 hours to remove cattle from the area if they are found within the area before July 15.

- Frequent attempts will be made to drive cattle to the uplands of the Horse Mountain and Lucera Units.

South Herd

- Cattle will not be allowed in Deer Creek Unit until July 8 and on Deer Creek until July 15.

- Cattle will be pushed to Soft Water Spring when entering the Deer Creek Unit.

- Cattle will not be held in the South Fork Deer Creek enclosure for more than 24 hours without MNF approval.

- John Young Meadow will be monitored closely during the second entry and daily checks are recommended after cattle have been in the unit for four days.

- MNF personnel will monitor steelhead spawning reaches prior to July15 to ensure no cattle are entering spawning areas.

Monitoring will include:

- IIT monitoring in selected pastures to ensure compliance with PACFISH requirements.

- Monitoring will be focused on the riparian areas of the following streams: (1) Deer Creek from forest boundary to Dead Injun Creek; (2) Lower Vester, Buck, Dead Injun, and North Fork Deer Creeks; (3) Confluence of Corral Creek to Alder Creek; (4) South Fork Deer Creek to above exclosures; (5) South Fork Murderers Creek from forest boundary to Bark Cabin Creek; (6) South Fork Murderers Creek from Bark Cabin Creek to Beaverdam Creek; (7) Thorn and Duncan Creeks; (8) Crazy Creek from confluence to one mile upstream; (9) Murderers Creek from forest boundary to Stewart Cabin; and (10) Murderers Creek from Steward Cabin to Guard Station.

- Thorn and Duncan creeks will be surveyed to confirm salmonid use. Todd and Cabin Creeks in the Aldrich Unit will be monitored to confirm fish-bearing status on MNF lands. Timber Mountain Unit will be surveyed for steelhead redds and spawning activity prior to turnout.

- MNF personnel will monitor for utilization standards on Deer Creek in the Frenchy Unit.

1.3.4 Upper Middle Fork Allotment

The Upper Middle Fork allotment will be grazed primarily to validate the grazing permit which requires the permittee to put 90% of the permitted cattle on the allotment for a minimum period of time. Four hundred and forty cattle will be turned onto the Lower Vinegar Pasture. Within the next two days, 200 cattle will be removed and the remaining 240 will be moved into the Austin pasture. They will remain in the Austin pasture for 15 days and then move back into the Lower Vinegar Pasture for an additional 15 days until August 15. The rotation is summarized in Table 6. The standard for riparian greenline stubble height is 4 inches, the shrub utilization standard is light to moderate, and the bank damage standard is less than 10%.

Protective measures will include:

- PACFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the allotment. Additionally the allotment will be managed to meet Riparian Management Objectives.

- Herding, salt placement, and fence, trough, and stock pond maintenance will aid in keeping livestock away from critical riparian areas.

- Pasture rotation and utilization standards are designed to minimize the impacts of grazing on listed MCR steelhead. They also aid in minimizing impacts to riparian habitats which are essential to maintaining instream habitat quality for salmonids.

Table 6. Proposed Grazing Schedule, Utilization Standards, and MCR Steelhead Streams for Pastures in the Upper Middle Fork Allotment for the 2003 Grazing Season

Unit	# of livestock	Grazing dates*	End-of-season utilization standard	MCR steelhead streams
Caribou	0	n/a	none	Little Boulder Creek, Windlass Creek, Caribou Creek, Granite Boulder Creek
Butte	0	n/a	none	Butte Creek, Little Butte Creek, Ragged Creek, Ruby Creek
Deerhorn	0	n/a	none	Placer Gulch, Davis Creek, Deerhorn Creek
Austin/Lower Vinegar	440 240	July 15-July 17 July 17-August 15	4-inch stubble height	Mill Creek
Upper Vinegar	0	n/a	none	Vincent Creek, Vinegar Creek
River	Short-term gathering pasture	Will only be used to gather at end of season (after July 15) if needed.	4-inch stubble height	M. Fk. John Day
Shop	Short-term gathering pasture	August 13-August 15	4-inch stubble height	M. Fk. John Day

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

Monitoring will include:

- Permittees will be responsible for monitoring indicators and meeting end of season utilization standards.
- IIT monitoring will take place in selected pastures to ensure compliance with PACFISH requirements.
- The stubble height end of season utilization standard will be 6 inches until a PFC survey data are available to support a 4-inch move trigger.

1.3.5 Mount Vernon/John Day/Beech Creek Allotments

The Mount Vernon/John Day/Beech Creek allotments are used by the same permittee in conjunction with other one another throughout the grazing season. End-of-season utilization standards for the allotment will be 4 inches of residual stubble, light to moderate browsing of shrubs, and less than 10% bank damage. The pasture rotations and management are described in Table 6.

Table 7. Proposed Grazing Schedule, Utilization Standards, and MCR Steelhead Streams for Pastures in the Mount Vernon/John Day/Beech Creek Allotments for the 2003 Grazing Season.

Unit	# of livestock	Grazing dates*	End of season utilization standard	MCR steelhead streams
John Day Allotment				
Ennis	150	June 11-September 19	4-inch stubble height	East Fork Beech Creek, Clear Creek
McClellan	150	September 19-October 10	4-inch stubble height	McClellan Creek
Mount Vernon Allotment				
Belshaw	346	September 6-October 20	4-inch stubble height	Belshaw Creek, Birch Creek
Bear Creek	346	June 11-August 1	4-inch stubble height	Bear Creek
Cohoe	346	August 2-September 5	4-inch stubble height	none
Beech on/off Allotment				
Beech	35	May 15-November 30	4-inch stubble height	Bear Creek, East Fork Beech Creek, McClellan Creek, Beech Creek

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

Protective measures will include:

- PACFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the allotment. Additionally the allotment will be managed to meet Riparian Management Objectives.

- Herding, salt placement, and fence, trough, and stock pond maintenance will aid in keeping livestock away from critical riparian areas.

- Management techniques such as salting and herding will be used to keep cattle away form Belshaw Creek during the spawning period.

Monitoring will include:

- Permittees will be responsible for monitoring indicators and meeting end of season utilization standards.

- IIT monitoring will take place in selected pastures to ensure compliance with PACFISH requirements.

1.3.6 Dixie Allotment

The Dixie Allotment will grazed by 300 cow/calf pairs from June 1 to October 15. The on/off allotment is divided into two pastures, Bear and Standard Creek. End-of-season utilization standards for the allotment will be 4 inches of residual stubble, light to moderate browsing of shrubs, and less than 10% bank damage. The pasture rotations and management are described in Table 7.

Table 8. Proposed Grazing Schedule, Utilization Standards, and MCR Steelhead Streams for Pastures in the Dixie Allotment for the 2003 Grazing Season

Unit	# of livestock	Grazing dates*	End-of-season utilization standard	MCR steelhead streams
Bear Creek	300	August 2 -October 15	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Bear Creek, Hall Creek, Dixie Creek
Standard Creek	300	June 1- August 1	4-inch stubble ht., light-moderate shrub utilization, <10% bank damage	Dixie Creek, Standard Creek

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

Protective measures will include:

- PACFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the allotment. Additionally the allotment will be managed to meet Riparian Management Objectives.

- Herding, salt placement, and fence, trough, and stock pond maintenance will aid in keeping livestock away from critical riparian areas.

Monitoring will include:

- Permittees will be responsible for monitoring indicators and meeting end of season utilization standards.

- IIT monitoring will take place in selected pastures to ensure compliance with PACFISH requirements.

1.3.7 Rosebud Allotment

The Rosebud Allotment will grazed by 87 cow/calf pairs from June 1 to October 21. This allotment is divided into 4 pastures. End-of-season utilization standards for the allotment will be 4 or 6 inches of residual stubble and light browsing of shrubs. The pasture rotations and management are described in Table 8.

Table 9. Proposed Grazing Schedule, Utilization Standards, and MCR Steelhead Streams for Pastures in the Rosebud Allotment for the 2003 Grazing Season

Unit	# of livestock	Grazing dates*	End-of-season utilization standard	MCR steelhead streams
Rosebud	87	June 1- July 5	4-inch stubble ht., light shrub utilization	various tributaries above Izee Falls, a fish passage barrier on the SFJDR
Capps Creek	87	July 6 - August 10	6-inch stubble ht., light shrub utilization	various tributaries above Izee Falls, a fish passage barrier on the SFJDR
Morgan Creek	87	August 11- August 21	4-inch stubble ht., light shrub utilization	various tributaries above Izee Falls, a fish passage barrier on the SFJDR
Camp Faraway	87	August 22-September 5	4-inch stubble ht., light shrub utilization	various tributaries above Izee Falls, a fish passage barrier on the SFJDR

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

Protective measures will include:

- PACFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the allotment. Additionally the allotment will be managed to meet Riparian Management Objectives.

- Herding, salt placement, and fence, trough, and stock pond maintenance will aid in keeping livestock away from critical riparian areas.

Monitoring will include:

- Permittees will be responsible for monitoring indicators and meeting end of season utilization standards.

- IIT monitoring will take place in selected pastures to ensure compliance with PACFISH requirements.

- Close monitoring of Morgan Creek in the Morgan Creek Unit

1.3.8 Sugarloaf Allotment

The Sugarloaf Allotment will be grazed by two herds which collectively total 355 cow/calf pairs. The allotment is divided into seven pastures, and is grazed from June 15 to October 30. End-of-season utilization standards will be 4 inches of residual stubble height and light browsing of shrubs. The pasture rotations and management are described in Table 9.

Table 10. Proposed Grazing Schedule, Utilization Standards, and MCR Steelhead Streams for Pastures in the Sugarloaf Allotment for the 2003 Grazing Season

Unit	# of livestock	Grazing dates*	End-of-season utilization standard	MCR steelhead streams
Rock Springs	225	June 15-July 15	4-inch stubble height, light shrub utilization	None
Dark Bear	225	July 16-Aug. 15	4-inch stubble height, light shrub utilization	None
Canyon Creek	225	Aug. 16-Oct. 1	4-inch stubble height, light shrub utilization	Wall Creek, East Fork Canyon Creek, Middle Fork Canyon Creek
Wickiup	225	Oct. 1-Oct. 15	4-inch stubble height, light shrub utilization	Canyon Creek
Sloan	130	June 15-July 20	4-inch stubble height, light shrub utilization	None
Pearson	130	July 21-Sept. 13	4-inch stubble height, light shrub utilization	None
Pearson Meadows	130	Sept. 13-Oct. 15	4-inch stubble height, light shrub utilization	None

*Dates may be changed to avoid or minimize take and meet end of season utilization standards.

Protective measures will include:

- PACFISH standards and guidelines for grazing (GM-1 thru GM-4) will be incorporated into the Annual Operating Instructions for the grazing allotment. Additionally, the allotment will be managed to meet Riparian Management Objectives.

- Herding, salt placement, fence, water development maintenance, and spring developments will aid in keeping cattle away from critical riparian areas.

- No cattle will be allowed on Canyon Creek prior to July 15.

Monitoring will include:

- Permittees will be responsible for monitoring indicators and meeting end of season utilization standards.

- IIT monitoring will take place in selected pastures to ensure compliance with PACFISH requirements.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The MCR steelhead evolutionarily significant unit (ESU) was listed as threatened under the ESA by NOAA Fisheries on March 25, 1999 (64 FR 14517). Protective regulations for MCR steelhead were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). Biological information concerning the MCR steelhead is found in Busby *et al.* (1996).

The major drainages in the MCR steelhead ESU are the Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima river systems. NOAA Fisheries (2003) has indicated that the 5-year average (geometric mean) abundance of natural MCR steelhead was up from previous years basin estimates in the ESU. The Klickitat, Yakima, Touchet, and Umatilla systems are all well below their interim abundance targets (Table 10). The John Day and Deschutes are at or above their interim targets for abundance, however there is significant concern regarding the straying of fish into the Deschutes system from other ESUs (Table 10). The productivity estimate (λ) of the MCR ESU is approximately 0.98, indicating that the productivity of MCR steelhead is slightly below its target of 1.0. The NOAA Fisheries biological review team (BRT) has determined that the MCR ESU is likely to become endangered because of stock abundance and long-term productivity being depressed within the ESU.

Table 11. Interim Abundance Targets for the MCR Steelhead ESU (adapted from NOAA Fisheries 2003).

ESU/Spawning Aggregations*	Interim Abundance Targets	Interim Productivity Objective
Walla-Walla	2,600	Middle Columbia ESU populations are currently well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0
Umatilla	2,300	
Deschutes (Below Pelton Dam Complex)	6,300	
John Day		
North Fork	2,700	
Middle Fork	**1,300**	
South Fork	**600**	
Lower John Day	3,200	
Upper John Day	**2,000**	

*Populations in bold are addressed in this Opinion

The John Day River (JDR) is the largest river system in the range of MCR steelhead that is free of dams. There is currently no artificial propagation of steelhead in the system, and runs are driven almost exclusively by native stocks, making the JDR system unique within the ESU. However, there is some straying of hatchery fish into the JDR system from the Columbia River (Unterwegner and Gray 1997). The ODFW estimates yearly returns of adult steelhead to the JDR basin from 3,900 to 36,400, with estimated escapement averaging 13,988 adults since 1987. NOAA Fisheries (2003) states that while the JDR system has met or exceeded interim abundance targets for the last 5 years, the long term trend for abundance is still downward.

The JDR and its tributaries, to include the South Fork John Day River (SFJDR), MFJDR, and UJDR subbasin streams, provide spawning, rearing, and migratory habitat for both adult and juvenile life stages of MCR steelhead. In 2002, redd abundance in these three subbasins was at its highest levels since listing. Adult MCR steelhead enter the Columbia River beginning in the spring and migrate upriver through the summer, fall, and winter, seeking their tributary of origin. By early the following spring, the adults have reached their natal streams and spawn in gravel redds/nests from March to early June. Deposited eggs usually hatch by the July of the same year. The resulting juveniles will spend from one to four years rearing to smolt size, at which time they will begin their migration to the ocean.

Essential features of the adult spawning, juvenile rearing, and adult and migratory habitat for this species are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. (Bjornn and Reiser, 1991; NOAA Fisheries, 1996b; Spence *et al.*, 1996). The essential features

that the proposed project may affect are: Substrate, water quality, water temperature, water velocity, cover/shelter, food, and riparian vegetation.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps: (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the continued existence of the ESA-listed species. If NOAA Fisheries finds that the action is likely to jeopardize the ESA-listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

NOAA Fisheries has developed guidelines for basin-level, multispecies recovery planning on which individual, species-specific recovery plans can be founded. "Basin-level" encompasses habitat, harvest, hatcheries, and hydro. The recovery planning analysis is contained in the document entitled "Conservation of Columbia Basin Fish: Final Basinwide Salmon Recovery Strategy" (hereafter, the Basinwide Recovery Strategy [Federal Caucus 2000]). The Basinwide Recovery Strategy will be used to guide recovery planing for MCR steelhead. The recovery plan will provide the particular statutorily required elements of recovery goals, criteria, management actions, and time estimates that are not developed in the Basinwide Recovery Strategy.

Among other things, the Basinwide Recovery Strategy calls for restoration of degraded habitats on a priority basis to produce significant measurable benefits for listed anadromous and resident fish. Immediate and long-term priorities for restoration measures relevant to this consultation include the following general habitat improvements for tributary reaches:

- Restoring tributary flows.
- Addressing passage obstructions.
- Protecting the currently productive habitat.
- Increasing the amount of habitat.
- Improve water quality.

The Basinwide Recovery Strategy also established these specific habitat improvement action priorities for the JDR basin:

- Fix flow, screening and passage problems in priority subbasins...in the...JDR basin.

Until the species-specific recovery plans are developed, the Basinwide Recovery Strategy provides the best guidance for judging the significance of an individual action relative to the

species-level biological requirements. In the absence of completed recovery planning, NOAA Fisheries strives to ascribe the appropriate significance to actions to the extent available information allows. Where information is not available on the recovery needs of the species, either through recovery planning or otherwise, NOAA Fisheries applies a conservative substitute that is likely to exceed what would be expected of an action if information were available.

2.1.3 Biological Requirements

The first step the NOAA Fisheries uses when applying the ESA section 7(a)(2) to listed steelhead is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list MCR steelhead for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for MCR steelhead to survive and recover to naturally reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, spawning and rearing. MCR steelhead survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse impacts of current practices. In conducting analyses of habitat-altering actions and essential habitat elements, NOAA Fisheries defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and uses a "habitat approach" in its analysis (NOAA Fisheries 1999). The current status of the MCR steelhead, based upon their risk of extinction, has not significantly improved since the species was listed.

2.1.4 Environmental Baseline

The environmental baseline is an analysis of the effects of past, present, human-related and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR 402.02).

The action area for this consultation, includes: (1) Dixie Creek, Bear Creek, and their tributaries within or adjacent to the MNF-administered portions of the Dixie Allotment; (2) Rosebud Creek, Caps Creek, Poison Creek, Mogan Creek, and their tributaries within or adjacent to the MNF-administered portions of the Rosebud Allotment; (3) Canyon Creek, Middle Fork Canyon Creek, East Fork Canyn Creek, Crazy Creek, Wickiup Creek, West Fork Wickiup Creek, Wall Creek,

and their tributaries within or adjacent to the MNF-administered portions of the Sugarloaf Allotment; (4) Beech Creek, East Fork Beech Creek, Belshaw Creek, and their tributaries within or adjacent to the MNF-administered portions of the Mt. Vernon-John Day-Beech Creek Allotment; (5) Murderers Creek, Deer Creek, and their tributaries within or adjacent to the MNF-administered portions of the Murderers Creek Allotment; (6) Camp Creek, Cottonwood Creek, Cougar Creek, Coxie Creek, Lick Creek, Long Creek, West Fork Lick Creek, Jonas Creek, and their tributaries within or adjacent to the MNF-administered portions of the Long Creek Allotment; (7) Vincent Creek, Vinegar Creek, Little Boulder Creek, Windless Creek, Caribou Creek, Granite Boulder Creek, MFJDR (downstream to the forest boundary), Ruby Creek, Butte Creek, Little Butte Creek, Ragged Creek, Placer Gulch Creek, and their tributaries within or adjacent to the MNF-administered portions of the Upper Middle Fork Allotment; and (8) Granite Boulder Creek, Beaver Creek, Dry Creek, Big Boulder Creek, Wray Creek, Badger Creek, Myrtle Creek, Porky Creek, Big Creek, Deadwood Creek, Onion Gulch, Swamp Gulch, Coyote Creek, Elk Creek, Deep Creek, Sunshine Creek, Balance Creek, and their tributaries within or adjacent to the MNF-administered portions of the Lower Middle Fork Allotment These streams contain spawning, rearing, or migratory habitat for MCR steelhead.

The UJDR subbasin encompasses 1,008,414 acres from the headwaters of the JDR in the Blue and Strawberry Mountains downstream to the NFJD River confluence at RM 185 near Kimberly, Oregon. The MNF administers 427,298 acres (42.4%) in the UJDR subbasin. Another 41.8% is private, 8.2% is administered by the BLM, 5.4% is on the Ochoco National Forest, and 2.2% is owned by the state of Oregon. Major tributaries within the subbasin include Rock Creek, the SFJDR, Beech Creek, Canyon Creek, Dixie Creek, and Strawberry Creek. The MNF-administered portions of the three livestock grazing allotments addressed in this Opinion comprise a total of approximately 120,350 acres (12%) of the land in the UJDR subbasin. Izee Falls is a natural waterfall located on the SFJDR at RM 28.5, and is a complete barrier to upstream migration by anadromous salmonids.

The MFJDR subbasin encompasses 506,853 acres from its headwaters to its confluence with the NFJDR at RM 32.2. The MNF manages 270,473 acres (53%) of the subbasin. Major tributaries to the MFJDR include Clear Creek, Big Creek, and Granite Boulder Creek. The MNF-administered portions of the three livestock allotments addressed in this Opinion comprise a total of approximately 126,600 acres (25%) of the land in the MFJDR subbasin.

Environmental baseline conditions within the action area were evaluated for the subject actions at the project level and watershed scales. The results of this evaluation, based on the "matrix of pathways and indicators" (MPI) described in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NOAA Fisheries 1996), follow. This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

In the UJDR subbasin, 12 of the 18 habitat indicators in the MPI were rated as "functioning at risk." These are: Chemical contaminants/nutrients, large woody debris, large pools, off-channel habitat, refugia, width/depth ratio, streambank condition, floodplain connectivity, change in

peak/base flow, drainage network increase, disturbance history, and RHCA. Six of the 18 were rated as "not properly functioning." These are: Temperature, sediment, physical barriers, substrate embeddedness, pool frequency and quality, and road density and location. None of the habitat indicators were rated by the MNF as properly functioning. The environmental baseline conditions for each habitat indicator in the MPI are described in the BA, and incorporated into this Opinion by reference. This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species. An assessment of the essential features of MCR steelhead habitat are obtained by using the MPI process to evaluate whether aquatic habitat is properly functioning.

In the MFJDR subbasin, 12 of the 18 habitat indicators in the MPI were rated as "functioning at risk." These are: Sediment, chemical contaminants/nutrients, large woody debris, off-channel habitat, refugia, width/depth ratio, streambank condition, floodplain connectivity, change in peak/base flow, drainage network increase, disturbance history, and RHCA. Six of the 18 were rated as "not properly functioning." These are: Temperature, physical barriers, substrate embeddedness, pool frequency and quality, large pools, and road density and location. None of the habitat indicators were rated by the MNF as properly functioning. The environmental baseline conditions for each habitat indicator in the MPI are described in the BA, and incorporated into this Opinion by reference. These habitat indicators provide the template for assessing the important elements of MCR steelhead habitat. This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species. An assessment of the essential features of MCR steelhead habitat is obtained by using the MPI process to evaluate whether aquatic habitat is properly functioning. Habitat conditions for the MFJDR and UJDR are summarized in Table 11.

Many of the pastures or units of allotments on the MNF contain areas where the current grazing practices are hindering the attainment of RMOs (USDA, USDI, 1994). In some areas livestock browsing of shrubs may be preventing the establishment of the healthy riparian plant community necessary to provide shade and woody debris. In other meadow areas, streambank condition is being adversely affected by trampling from livestock. Although many of these areas are located in the LAA allotments analyzed in detail in this Opinion, other areas of allotments the MNF determined to be NLAA may have similar problems. Monitoring data from the MNF and observations made by NOAA Fisheries representatives during site visits and the annual grazing tour indicate that this problem is more widespread than was considered during previous consultations. It is reasonably certain that this situation was exacerbated by the relatively dry and hot conditions during the grazing season from the period of 1999 to 2002.

The MNF has located or identified some these problem areas, but due to several factors, including lack of staffing, budget constraints, and large wildfires on the MNF during the summer of 2002, management plans to aid in the avoidance of these adverse effects in the future are not fully developed. Another factor compounding this problem is widespread unauthorized use and trespass of cattle on MNF-administered land. Some areas that the MNF has proposed for rest for

resource protection have been grazed, and in some cases over-grazed, to the point where riparian resources are impacted.

Table 12. Summary of Subbasin Conditions in the Action Area

MPI Pathways	MPI Indicators[1]	Subbasins	
		UJDR	MFJDR
Water Quality	Temperature	N	N
	Sediment	N	R
	Chemical Contaminants/ Nutrients	R	R
Access	Physical barriers	N	N
Habitat Elements	Substrate Embeddedness	N	N
	Large Woody Debris	R	R
	Pool Freq./Quality	N	N
	Large Pools	R	N
	Off Channel Habitat	R	R
	Refugia	R	R
Channel Conditions & Dynamics	Width/depth ratios	R	R
	Streambank Condition	R	R
	Floodplain connectivity	R	R
Flow/ Hydrology	Change in Peak Base Flow	R	R
	Drainage Network Increase	R	R
Watershed Condition	Road Density and Location	N	N
	Disturbance History	R	R
	RHCAs	R	R

[1] The condition of each MPI parameter is indicated in the following manner: A= properly functioning, R= functioning at risk, N= not properly functioning, U=data unavailable

2.1.4.1 Allotment-Specific Conditions

Long Creek Allotment.
Stream survey data on habitat parameters in Camp Creek, Cottonwood Creek, and Long Creek in the Flat Camp, Flat Cow Camp, and Ladd pastures indicates that stream stability is high with values ranging from 92 to 98%. In the Lick Creek pasture, Camp Creek, Cougar Creek, Trail Creek, and the West Fork of Lick Creek also exhibited high streambank stability with values ranging from 89 to 100%. In the Hiyu and Keeney Meadows pastures, Coxie and Deep Creeks had bank stability of 99 and 97%, respectively. Potential MCR steelhead spawning habitat exists in Camp Creek, Cottonwood Creek, Long Creek, Cougar Creek, Trail Creek, West Fork Lick Creek, Coxie Creek, and Deep Creek. Camp and Long Creek, and are on the CWA section 303(d) list for exceeding water temperature standards. The section of Long Creek that flows through Flood Meadows is experiencing heavy bank damage due to the frequent crossing of cattle in this area.

During the 2001 grazing season, excessive utilization occurred in the Lick Creek Unit of the Long Creek allotment. A lack of water sources in this allotment, compounded by the very dry conditions during the summer, caused cows to congregate in riparian areas and cause bank damage. Spawning surveys conducted in 2001 did not indicate any MCR steelhead spawning activity in Lick, Cougar, Camp or Trail creeks. In 2002, utilization standards were not met in the Lick Creek unit, with shrub browsing being a particular concern.

Lower Middle Fork Allotment.
Stream survey data on habitat parameters in Granite Boulder Creek, Beaver Creek, Dry Creek, Big Boulder Creek, Wray Creek, Badger Creek, and Myrtle Creek of the Granite Bouder Pasture indicate high streambank stability with values ranging from 91 to 99%. Dry Creek within the Granite Boulder Pasture has not been surveyed. Most stream reaches in the Granite Boulder Allotment exhibited high cobble embeddedness, and shade varied from 23 to 76%. On the Susanville, Pizer, and Chickenhouse Pastures (Big Creek, Deadwood Creek, Coyote Creek, Elk Creek, and Deep Creek), streambank stability ranged from 83 to 100%. Most reaches in the Susanville, Pizer, and Chickenhouse units exhibited high cobble embeddedness, and shade varied from 21 to 71%. The Balance Lake and Sunshine units contain Sunshine Creek. Sunshine Creek's bank stability is approximately 87%, shade varied from 35 to 61%, and cobble embeddedness was in excess of 30%. The Lower Middle Fork Allotment contains pastures which were burned in the 1996 Summit Fire. Those pastures which were burned have been rested since the fire through 2002. NOAA Fisheries visited a portion of Beaver Creek within the burn area in May of 2003. During the field visit, it was apparent that although some grasses had returned to the area, grass did not completely cover the ground. Very little woody vegetation had returned to the burn area, and much of the streambank appeared unstable as well. The allotment contains 42 miles of fish-bearing streams which contain habitat suitable for MCR steelhead. The MNF has indicated that this allotment has not consistently met utilization standards over the past five years.

Murderers Creek Allotment.
Stream survey information on this allotment indicates streambank stabilities of 91 to 100% for Murderers Creek, 97% for Crazy Creek, 85% for South Fork Murderers Creek, and 99% for Deer Creek. Stream substrates for all streams were found to be embedded. Sensitive areas along the South Fork of Murderers Creek are fenced to exclude cattle, and other sections of the stream are too steep and entrenched to allow cattle access. No information was available on streambank cover or stream shading. As mentioned above, Murderers Creek is on the CWA 303(d) list for exceeding water temperature standards.

Wild horses are present in all pasture units within the Murderers Creek Allotment. Over-utilization of riparian vegetation and streambank trampling by these horses may occur in some stream reaches where these animals tend to concentrate.

Surveys conducted by MNF Fisheries and Range personnel during July of 2000 found potential MCR steelhead spawning habitat in South Fork Murderers Creek and Crazy Creek in the Timber Mountain Pasture of this allotment. The lower 250 yards of Crazy Creek were found to contain some fair-to-poor quality spawning gravels in a Rosgen "B" channel type. The South Fork of Murderers Creek contains fair-to-good quality MCR steelhead spawning habitat in a mostly "B" with short sections of "C" channel types in the Timber Mountain Pasture.

Several units in this allotment did not meet utilization standards in 2001. In 2002, all units of the Murderers Creek allotment were reported as meeting utilization standards. However, site visits conducted by NOAA Fisheries indicated that many riparian areas were grazed beyond the 4-inch greenline stubble height standard. This allotment was visited during the end-of-year grazing tour. Excess utilization was observed in several areas during this tour.

Upper Middle Fork Allotment.
Mill Creek, within the Austin pasture, had 91% stable banks, and stream shading was 40%. In the Upper Vinegar and Lower Vinegar pastures, Vincent Creek exhibited greater than 90% bank stability. In the Caribou pasture, bank stability was high on Little Boulder Creek, Windless Creek, Caribou Creek, and Granite Boulder Creek with values ranging from 82 to 99%. Shade on Little Boulder Creek ranged from 23 to 28% while shade ranged from 43 to 50% on Windlass Creek. Caribou Creek had shade ranging from 18 to 38%, and on Granite Boulder Creek shade ranged from 34 to 40%. The MFJDR has 90% stable banks in the Shop and River pastures, while Ruby Creek's bank stability ranges between 91 to 96%. Shade on Ruby Creek ranged from 23 to 64%. In the Butte Creek pasture, Butte Creek, Little Butte Creek, and Ragged Creek all exhibited greater than 86% stable banks, and shade ranged from 31 to 66%. The only stream data available for the Deerhorn pasture is for Placer Gulch Creek and it indicates that average shade was 34%. Potential MCR steelhead spawning habitat has been found on Vincent Creek, Vinegar Creek, Little Boulder Creek, Windless Creek, Caribou Creek, Granite Boulder Creek, MFJDR, Ruby Creek, Butte Creek, Little Butte Creek, Ragged Creek, and Placer Gulch Creek. Caribou, Granite Boulder, Little Boulder, Little Butte, Ragged, and Vinegar Creek, and they are on the CWA section 303(d) list for exceeding water temperature standards.

Excess utilization occurred during the 2001 grazing season in the Deerhorn unit of the Upper Middle Fork allotment. The median height of stubble for 30 monitoring points was three inches. Recreational use in the riparian area of Davis Creek causes additional disturbance to riparian vegetation and streambanks in this area. The Lower Vinegar and Austin units met stubble height standards, had little or no shrub utilization, and very little bank damage.

In 2002, the Caribou, Lower Vinegar, Upper Vinegar units did not meet utilization standards. These units were reported as having greater than 10% bank damage and moderate to heavy shrub utilization. Unauthorized use is also a concerns in this allotment.

Mount Vernon/John Day/Beech Creek Allotments.
Stream survey data on streams in this allotment found streambank stabilities of 87% on Belshaw Creek, 92 to 96% on Bear Creek, 87% on Beech Creek, 73 to 84% on Clear Creek, 80% on the East Fork Beech Creek, and 86% on McClellan Creek. Substrates of all streams on this allotment were found to be embedded. No information was available on streambank cover or stream shading. Belshaw Creek is on the CWA 303(d) list for exceeding temperature standards. Beech Creek and its tributaries are not on the CWA 303(d) list.

Surveys conducted by MNF Fisheries and Range personnel during July of 2000 found potential MCR steelhead spawning habitat in McClellan, Birch, and Belshaw creeks. There are numerous beaver dams in McClellan Creek downstream from the Forest boundary on private land, some of which may be partial barriers to upstream migration by adult MCR steelhead at certain streamflows. Small patches of poor quality spawning substrate were found in Rosgen "C" and "B" channel types just upstream from private land in the McClellan Pasture. Further upstream in McClellan Creek (T12S, R31E, Section 11, NE1/4 of NE1/4) good quality MCR steelhead spawning gravel was found in Rosgen "C" channel type. Upstream from that reach, the valley becomes narrower creating a Rosgen "B" channel type and substrate is too large to be used by MCR steelhead for spawning. Birch Creek in the Belshaw Pasture is mostly steep "A" channel type with no spawning gravels, with one short reach of "B" channel containing a few small patches of poor quality (highly embedded) gravel. The lower 0.5 mile of Belshaw Creek (just upstream from private property) contains good quality MCR steelhead spawning gravel. No steelhead redds were found during the 2000 survey.

In the Ennis pasture, much of Clear Creek is inaccessible to livestock because of steep topography. In the Belshaw pasture, a fence along Belshaw Creek excludes cattle from most of that stream. Steep topography and dense vegetation limit access by livestock to Birch Creek in the Belshaw pasture.

According to the end-of-year Range Report for 2001 provided by the MNF, the McClellan unit of this allotment did not meet stubble height standards. The standards were not met in the McClellan Creek riparian area because cattle tend to concentrate in this area due to the availability of forage and water. Efforts planned to keep cattle out of riparian areas include herding, salt placement, and spring development. This allotment was not monitored in 2002.

Dixie Allotment.
Stream survey data on habitat parameters in Dixie, Standard, and Wickiup Creeks in the Standard Creek pasture of the Dixie Allotment indicate that streambank stability is high on all streams, ranging from 99 to 100%. Stream substrates are embedded in Dixie Creek, but not on other streams. Shrub cover along streambanks ranged from 23 to 87%, and stream shade from 50 to 63%. In the Bear Creek pasture, Bear Creek and Hall Creek also have stable streambanks (98 to 99%) and non-embedded substrates, with shrub cover ranging from 25 to 60%, and stream shade from 25 to 68%. Bear Creek is on the CWA section 303(d) list for exceeding water temperature standards, no other streams on this allotment are on the list.

Surveys conducted by MNF Fisheries and Range personnel during July of 2000 found potential MCR steelhead spawning habitat in Bear Creek and Dixie Creek on this allotment. No suitable MCR steelhead spawning habitat was found in Hall Creek (a Bear Creek tributary), as substrate was large and embedded. The reach of Bear Creek surveyed was classified as Rosgen "B" channel type, while Dixie Creek (0.2 mile downstream from Forest Road 2050) was classified as Rosgen "C" channel type (Rosgen 1996). No MCR steelhead habitat is present in the East Fork of Dixie Creek (Dixie Meadows). In the headwaters of main Dixie Creek (Rosgen "B" channel type), some poor-quality MCR steelhead spawning gravel is present, but it is heavily embedded. The segment of Standard Creek which was surveyed consisted of Rosgen "A" and "B" channel types, and most of the substrate was too large for MCR steelhead spawning. No steelhead redds were found during the 2001 survey.

Monitoring data from the MNF for 2002 is conflicting for this allotment. One report indicated that all utilization standards were met and another report indicated that bank damage exceeded 10% in the Bear Creek unit.

Rosebud Allotment.
The Rosebud Allotment consists of four units (Camp Faraway, Morgan, Capps, and Rosebud) Stream survey data was not provided for the Rosebud Allotment, however the BA indicates that this allotment has a lack of upland water sources and provides easy access for cattle into riparian areas. Because of past grazing, logging, and road activities, riparian areas in this allotment have experienced accelerated erosion. During six of the past twelve years, the allotment was not used to protect eroding slopes. Four streams originate in the Rosebud Allotment (Rosebud, Caps, Poison, and Morgan Creeks). These streams flow into the SFJDR and are approximately nine river miles above Izee Falls which is a natural anadromous fish barrier. The streams provide water to downstream habitat which is utilized by MCR steelhead. The MNF has indicated that this allotment has not consistently met utilization standards over the past five years.

Sugarloaf Allotment.
The Sugarloaf Allotment consists of ten units (Wickiup, Rock Springs, Sugarloaf, CH, Dark Bear, Canyon Creek, Triangle, Pearson, Sloan, and Pearson Meadows). Stream survey data was not provided for this allotment. The Dark Canyon Unit and Pearson unit only contain streams which flow into the Silvies River which does not support anadromous fish. The Sloan Unit and Pearson Meadows Unit are upland pastures which do not contain fish-bearing streams, and the Rock Springs Unit has only intermittent streams which do not contain fish. The Canyon Unit

and Wickiup unit support MCR steelhead. No description was provided for the Sugarloaf, CH, Dark Bear, and Triangle units. The MNF has indicated that this allotment has not consistently met utilization standards for the past five years.

2.1.5 Analysis of Effects

The effects determination in this Opinion was made using a method for evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them. The effects of actions are expressed in terms of the expected effect (restore, maintain, or degrade) on aquatic habitat elements and indicators in the action area.

2.1.5.1 NLAA Allotments

In the BA, the MNF determined that activities on 28 of the 36 livestock grazing allotments for the 2002 grazing season are NLAA actions for MCR steelhead. NOAA Fisheries concurs with the MNF's determinations that livestock grazing for the 2002 grazing season on these allotments are NLAA MCR steelhead. The rationale for reaching these determinations for each allotment can be found in Table 2 of this Opinion. NOAA Fisheries' concurrence is based on the following findings: (1) Timing of grazing rotations are such that cattle are not in pastures or are excluded from streams until July 15 in those pastures which contain or are adjacent to streams in which MCR steelhead may spawn; (2) exclusion measures include fencing or existing topographical and other natural features (*e.g.* thick brush, downed trees) that prevent livestock access to streams where MCR steelhead may spawn; (3) current grazing management strategies and monitoring requirements implemented by the MNF minimize impacts of livestock grazing on riparian vegetation and streambank stability on these MNF-administered livestock grazing allotments;
(4) MCR steelhead habitat indicators and elements such as bank stability, sediment, and width to depth ratios are improving under the current grazing practices. NOAA Fisheries believes there is less than a negligible likelihood of adverse affects or incidental take of MCR steelhead. The remaining allotments, addressed in detail in this Opinion, are LAA MCR steelhead.

2.1.5.2 LAA Allotments

Impacts of livestock grazing to stream habitat and fish populations can be separated into direct and indirect effects. Direct effects are those which contribute to the immediate loss or harm to individual fish or embryos (*e.g.*, stepping on a fish, trampling a redd that results in the actual destruction of embryos, dislodging the embryos from the protective nest and ultimately destroying eggs). Indirect effects are those impacts which occur at a later time, causing loss of specific habitat features (*e.g.*, undercut banks, sedimentation of spawning beds), localized reductions in habitat quality (*e.g.*, sedimentation, loss of riparian vegetation, changes in channel stability and structure), and, ultimately, cause loss or reductions of entire populations of fish, or widespread reductions in habitat quantity and/or quality.

Direct Effects to MCR Steelhead

Direct effects of livestock grazing may occur when livestock enter the streams occupied by MCR steelhead to loaf, drink, or cross the stream. During the early phases of their life cycle, MCR steelhead have little or no capacity for mobility, and large numbers of embryos or young are concentrated in small areas. Livestock entering fish-spawning areas can trample redds, and destroy or dislodge embryos and alevins. Belsky *et al.* (1997) provide a review of these direct influences on stream and riparian areas. Wading in streams by livestock can be assumed to induce mortality on eggs and pre-emergent fry at least equal to that demonstrated for human wading (Roberts and White 1992). In this investigation, a single wading incident upon a simulated spawning bed induced 43% mortality of pre-hatching embryos. In a recent (July 12, 2000) occurrence of unauthorized livestock grazing in the Sullens Allotment on the MNF, five out of five documented MCR steelhead redds in a meadow area of a Rosgen C-type stream channel in Squaw Creek (MFJDR subbasin) were trampled by cattle (U.S. Forest Service memorandum, August 17, 2000).

Avoidance of direct impacts to MCR steelhead spawning areas can be achieved by scheduling grazing in pastures containing spawning habitat to occur after July 15, or by excluding known spawning areas from livestock access. As mentioned above, the ODFW guidelines for the timing of in-water work in the JDR basin, which are designed to protect salmonid species, do not allow in-water work in any stream in the basin prior to July 15. The period during which spawning MCR steelhead adults may be susceptible to harassment, or eggs and pre-emergent fry susceptible to trampling by livestock, is from March 15 to July 15 in the JDR basin streams. In some allotments or pastures, there are pre-existing natural topographic, geologic, and vegetative features, or high spring water flows that naturally exclude or minimize livestock use from spawning areas. Other forms of direct take (*i.e.*, harassment of MCR steelhead by livestock when livestock enter or are adjacent to occupied habitat, resulting in MCR steelhead behavioral modifications) are more difficult to address in the context of an economically viable grazing program. Direct take in the form of harassment can be reduced in the long term by rangeland management that results in better riparian and in-channel habitat conditions, and create more cover and other important habitat features conducive to MCR steelhead survival and recovery.

Cattle wading into a stream to loaf, drink, or cross the stream have the potential to frighten juvenile MCR steelhead from streamside cover. Once these juveniles are frightened from cover and swim into open water, they become more susceptible to predation. However, NOAA Fisheries believes that the risk of mortality of juvenile salmonids due to flushing from cover by watering cattle is minimal.

Direct and Indirect Effects to MCR Steelhead Habitat

Numerous symposia and publications have documented the detrimental effects of livestock grazing on stream and riparian habitats (Johnson *et al.* 1985; Menke 1977; Meehan and Platts 1978; Cope 1979; American Fisheries Society 1980; Platts 1981; Peek and Dalke 1982; Ohmart and Anderson 1982; Kauffman and Krueger 1984; Clary and Webster 1989; Gresswell *et al.* 1989; Kinch 1989; Chaney *et al.* 1990, Belsky *et al.* 1997). These publications describe a series of synergistic effects that can occur when cattle over-graze or impact riparian areas: (1) Woody and hydric herbaceous vegetation along a stream can be reduced or eliminated; (2) streambanks

can collapse due to livestock trampling; (3) without vegetation to slow water velocities, hold the soil, and retain moisture, flooding can cause erosion of streambanks; (4) the stream can become wider and shallower, and in some cases downcut; (5) the water table can drop; and (6) hydric, deeply rooted herbaceous vegetation can die out and be replaced by upland species with shallower roots and less ability to bind the soil. The resulting instability in water volume, increased summer water temperature, loss of pools and habitat adjacent and connected to streambanks, and increased substrate fine sediment and cobble-embeddedness adversely affect MCR steelhead and their habitat. Specific effects to MCR steelhead habitat elements are described below.

Riparian Vegetation and Shade

In areas under historic season-long grazing, major vegetation changes can and have taken place with changes in livestock use. Routinely grazing an area too late in the growing season can cause adverse changes in the plant community. Individual plants are eliminated by re-grazing them during the growing season and not allowing adequate recovery after grazing. Regardless of seral stage, at least six inches of residual stubble or regrowth is recommended to meet the requirements of plant vigor maintenance, bank protection, and sediment entrapment (Clary and Webster 1989). More than six inches of stubble height may be required for protection of critical fisheries or easily eroded streambanks and riparian ecosystem functions (Clary and Webster 1989). In the Blue Mountains of eastern Oregon, regrowth of herbaceous vegetation does not normally occur after July (Gillen *et al.* 1985). Consequently, livestock use of riparian vegetation in the summer and fall needs to be tightly controlled to ensure adequate stubble height to protect streambanks during high streamflows in winter and spring.

Over time, entire plant communities can change as a result of heavy or prolonged grazing pressure. In mountain riparian systems of the Pacific Northwest, the replacement of native bunch grass with Kentucky bluegrass has occurred in many areas. Kentucky bluegrass has established itself as a dominant species in native bunch grass meadows as a result of overgrazing and subsequent habitat deterioration. Plants in the early seral stage community do not provide as much protection for the watershed and streambanks. Many forbs and annual plants that frequently dominate early seral plant communities do not have the strong deep root systems of the later seral perennials such as bunch grasses, sedges, rushes, shrubs, and willows. Kauffman *et al.* (1982) found that when grazing in moist meadows was halted, succession towards a more mesic/hydric plant community occurred.

The riparian areas in the JDR are particularly sensitive to overgrazing by exotic ungulates because the native vegetation of the grasslands west of the Rocky Mountains evolved in the absence of large herbivores for the past 2,500 years (Mack and Thompson 1982 *cited in* Li *et al.* 1994). In contrast, grasses east of the Rocky Mountains evolved with the bison and the impact of exotic ungulates (cattle and sheep) on the grass communities was not as severe (Li. *et al.* 1994).

Removal of riparian vegetation reduces habitat quality, resulting in negative impacts to fish production (Platts and Nelson 1989). Reductions in streambank cover related to overhanging vegetation, root vegetation, and undercut banks nas been correlated to reduced fish production

(EPA 1993). These effects are particularly evident in meadow systems, where herbaceous vegetation may provide the only shade to stream channels. Stream cover in hardwood dominated riparian systems can also be damaged, in some situations, by livestock grazing. Shrubby vegetation, such as willows, may be an important source of shade along smaller streams and in mountainous areas (Henjum *et al*. 1994). Cattle often begin to browse woody species when herbaceous stubble heights fall below 10 cm, or approximately 4 inches (Hall and Bryant 1995). Others suggest that 10-20 cm, or approximately 6-8 inches, of herbaceous residual stubble height may be needed to protect hardwoods, especially during late season grazing (Clary and Leininger 2000).

In a study of late season grazing in the Blue Mountains of eastern Oregon, Kauffmann *et al.* (1983) found that shrub use was generally light except on willow-dominated gravel bars. They conclude that on gravel bars, succession was retarded by livestock grazing. In a later study in the same area, Green and Kauffman (1995) found livestock disturbance and ecosystem response to be highly variable among plant communities. In areas rested from grazing in this study, abundance of undesirable non-native species decreased. They also found that in grazed areas, height, establishment, and reproduction of woody species on gravel bars was less than in ungrazed areas. These studies suggest that although livestock grazing may not have adverse effects to mature individuals of wood species such as willows, recolonization of disturbed areas, such as gravel bars, may be impeded by livestock grazing. Another study with similar results found that regeneration of some woody vegetation, such as willow, cottonwood, and aspen is inhibited by browsing on seedlings (Fleischner 1994).

In a study of watersheds in the JDR basin, Maloney *et al.* (1999) found that watersheds with less than 75% surface shade can exceed stream temperature standards for rainbow trout and chinook salmon. Stream temperatures in all heavily grazed watersheds in this study exceeded standards for salmonids. The authors concluded that revegetation of the streamside area with shrubs or small trees would likely result in reduced stream temperatures and an improved environment for rainbow trout and chinook salmon. They further suggest that maintaining the integrity of the riparian zone could be achieved by using buffer strips and more stringent control of animal usage in riparian areas.

Li (1994) noted that solar radiation reaching the channel of an unshaded stream in the JDR basin was six times greater than that reaching an adjacent, well-shaded stream, and that summer temperatures were 4.5 ºC warmer in the unshaded tributary. Below the confluence of these two streams, reaches that were unshaded were significantly warmer than shaded reaches both upstream and downstream. A separate comparison of water temperatures at two sites of similar elevation in watersheds of comparable size found temperature differences of 11ºC between shaded and unshaded streams (Li 1994). Warming of streams from loss of riparian vegetation is likely widespread in eastern Oregon, and may be particularly acute because of low summer flows and many cloudless days

Livestock indirectly affect plant species composition in riparian areas by aiding the dispersal and establishment of nonnative species, *i.e.* seeds may be carried on the fur or in the dung of livestock (Fleischner 1994). The presence of nonnative species, especially invasive and highly

competitive weed species such as knapweeds and thistles, can disrupt the natural functions of riparian areas.

Streambank Stability and Channel Morphology

Removal of the streambank/riparian vegetation as well as mechanical bank damage reduces the structural stability of the stream channel with several negative impacts to fish productivity resulting (EPA 1993, Platts 1990). Several studies have shown that heavy livestock grazing pressure causes significant streambank damage (Kaufman *et al.* 1983, Clary and Kinney 2002, Hackey 1989). Studies in eastern Oregon and northern California implicate livestock as a major cause of channel downcutting (Dietrich *et al*. 1993; Peacock 1994). Other studies indicate that light or moderate grazing pressure did not result in significant streambank damage (Buckhouse *et al.* 1981).

Riparian areas over-grazed by cattle often have reduced salmonid living space caused by increased stream channel widening and increased width/depth ratios (Platts and Nelson 1989, EPA 1993). When riparian areas are over-grazed, a synergistic adverse effect on streambank stability occurs. As stubble height of herbaceous vegetation along streambanks decreases, livestock eating this vegetation must move more frequently to achieve intake needs. Increased movement leads to trailing in riparian areas causing more compaction and bank damage (Clary and Lenninger 2000).

Riparian Soils

Livestock grazing also influences vegetation by modifying soil characteristics. Hooves compact soils that are damp or porous, which inhibits the germination of seeds and reduces root growth (Heady and Child 1994). The degree of soil compaction depends on soil characteristics, including texture, structure, porosity, and moisture content (Platts 1991; Heady and Child 1994), and the movement of animals as directed by the permitee or rider. Generally, soils that are high in organic matter, porous, and composed of a wide range of particle sizes are more easily compacted than other soils. Similarly, moist soils are usually more susceptible to compaction than dry soils, although extremely wet soils may give way and then recover following compression by livestock (Clayton and Kennedy 1985).

Changes in soil infiltration capacity associated with soil compression due to livestock may lead to more rapid surface runoff, lowering moisture content of soil and the ability of plants to germinate or persist (Heady and Child 1994). However, sometimes livestock may break up impervious surface soils, allowing for greater infiltration of water and helping to cover seeds (Savory 1988 *cited in* Heady and Child 1994). Soils in arid and semi-arid lands have a unique microbiotic surface layer or crust of symbiotic mosses, algae, and lichens that covers soil between and among plants. This "cryptogamic crust" plays an important role in hydrology and nutrient cycling and is believed to provide favorable conditions for the germination of vascular plants (Fleischner 1994). The hooves of livestock break up these fragile crusts, and reformation may take decades. Anderson *et al*. (1982) found recovery of cryptogamic crusts took up to 18 years in ungrazed enclosures in Utah. In arid and semi-arid climates, the cryptogamic crust has been shown to increase soil stability and water infiltration (Loope and Gifford 1972; Kleiner and

Harper 1977; Rychert *et al*. 1978). Disruption of the cryptogamic crust may thus have long-lasting effects on erosional processes.

If improper management leads to overgrazing, livestock also indirectly alter surface soils by removing ground cover and mulch, and soil compaction which in turn affects the response of soils to rainfall. Kinetic energy from falling raindrops erodes soil particles (splash erosion), which may then settle in the soil interstices resulting in a less-pervious surface. Livestock grazing can increase the percentage of exposed soil and break down organic litter, reducing its effectiveness in dissipating the energy of falling rain. However, livestock in open range conditions are not normally observed in concentrations sufficient to cause this type of effect.

Water Quality

Removal of riparian vegetation from grazing results in increased insolation reaching streams, leading to cumulative increases in downstream temperatures (Barton *et al.* 1985). This is especially true for high desert watersheds of the intermountain West, such as the JDR basin (Platts and Nelson 1989). Alteration of stream temperature processes may also result from changes in channel morphology. As mentioned above, the streams in areas that are improperly grazed are wider and shallower than in ungrazed systems, thus exposing a larger surface area to incoming solar radiation (Bottom *et al*. 1985; Platts 1991). Wide, shallow streams heat more rapidly than narrow, deep streams (Brown 1980). Similarly, wide, shallow streams may cool more rapidly, increasing the likelihood of anchor ice formation. Reducing stream depth may expose the stream bottom to direct solar radiation, which may allow for greater heating of the substrate and subsequent conductive transfer to the water.

Bell (1986) reported the upper lethal temperature for steelhead to be 75.02° F with a preferred temperature range of 50-55° F. The ability of rearing MCR steelhead to tolerate temperature extremes to a certain degree depends on the fish's recent thermal history, however, research indicates that most salmonid species are at risk when temperatures exceed 73-77° F (Spence *et al.* 1996). In addition to the lethal effects of high temperatures, ectothermic salmonids rearing at temperatures near the upper lethal limit experience decreased growth because nearly all consumed food is used for metabolic maintenance (Bjornn and Reiser 1991). Temperatures exceeding the upper lethal limits may be tolerated for brief periods or fish may seek thermal refugia. Li *et al.* (1991) reported that resident rainbow trout in an eastern Oregon stream selected natural and artificially created coldwater areas when temperatures in the main stream channel exceeded 75.2° F, but showed no preference for these areas when temperatures in the main stream channel were less than 68° F. Coldwater refugia, such as springs and groundwater seeps, allow some MCR steelhead to persist in areas where temperatures in main stream channels exceed their upper lethal limit. However, total MCR steelhead production in stream reaches will decrease if the amount of habitat suitable for the species use decreases as temperatures increase and fish are restricted to coldwater refugia areas.

Increases in stream temperature due to removal of streamside vegetation will also have a negative effect on dissolved oxygen (DO) concentrations. As temperatures increase, oxygen solubility in water decreases and DO levels decrease. Salmonids require an approximate DO level of 6 mg/L to survive, and suffer no metabolic impairment when DO levels remain at 8

mg/L (Davis 1975). Phillips and Campbell (1961) determined that DO levels must average greater that 8mg/L for embryos and alevins to have good survival rates. Silver *et al*. (1963) and Shumway *et al*. (1964) observed that salmonids reared in water with low or intermediate oxygen levels were smaller in size and had a longer incubation period than those raised in high DO levels. Low DO levels increased the incubation periods for anadromous species, and decreased the size of alevins (Garside 1966; Doudoroff and Warren 1965; Alderdice *et al*. 1958). Some studies have shown that salmonids may be able to withstand periods of DO levels as low as 5 mg/L, but growth, food conversion efficiency, and swimming performance will be adversely affected (Bjornn and Reiser 1995).

Because riparian areas are favored by cattle and sheep, nutrients eaten elsewhere on the range are often deposited in riparian zones or near other attractors, such as salt blocks (Heady and Child 1994). The deposition of nutrients in riparian areas increases the likelihood that elements such as nitrogen and phosphorous will enter the stream. Nutrients derived from livestock wastes may be more bioavailable than those bound in organic litter.

Prey Base

The coldwater communities which rearing juvenile salmonids rely on require minimum DO levels of between 6 and 8 mg/L (ODEQ 1995). The aquatic invertebrates and other coldwater fish that rearing juvenile steelhead rely on for food require DO levels in this range. As temperatures increase and DO levels drop, these communities shift from salmonids and less tolerant aquatic invertebrates, such as mayflies and stoneflies, to a more coolwater structure dominated by sculpins and tolerant aquatic invertebrates such as chironomids.

Reduction in the riparian canopy increases solar radiation and temperature, and thus stimulates production of periphyton (Lyford and Gregory 1975). In a study of high desert streams, Tait *et al.* (1994) found that less-palatable trout prey dominated the food base in warmwater stream reaches exposed to sunlight. In this study, Tait *et al*. (1994) reported that thick growths of filamentous algae encrusted with epiphytic diatoms were found in reaches with high instances of solar radiation, whereas low amounts of epilithic diatoms and blue-green algae dominated in shaded reaches. Periphyton biomass was significantly correlated with incident solar radiation. While densities of macroinvertebrates in forested streams typically increase in response to increased periphyton production, the effect of stimulated algal growth in rangeland streams is less clear. Tait *et al*. (1994) found that biomass, but not density, of macroinvertebrates was greater in reaches with greater periphyton biomass. The higher biomass was a consequence of many *Dicosmoecus* larvae, a large-cased caddisfly, that can exploit filamentous algae. Consequently, any potential benefits of increased invertebrate biomass to organisms at higher trophic levels, including salmonids, may be small, because these larvae are well protected from fish predation by their cases. Tait *et al*. (1994) suggest that these organisms may act as a trophic shunt that prevents energy from being transferred to higher trophic levels.

A study by Li *et al.* (1994) in the JDR basin, found that colder streams supported the highest standing crops of trout and had the most favorable trout: invertebrate standing crop ratios, suggesting that colder streams in this basin have a greater trophic efficiency leading to salmonid production. Inputs of fine sediment resulting from livestock trampling banks could also reduce

benthic invertebrate abundance. Studies have shown that sediment inputs resulting in substrate embeddedness of greater than one third can result in a decrease in benthic invertebrate abundance and thus a decrease in food available for juvenile salmonids (Waters 1995).

Reducing riparian vegetation can also reduce habitat for terrestrial insects, an important food for juvenile salmonids (Platts 1991). Riparian vegetation also provides organic material directly to the stream, which makes up about 50% of the stream's nutrient energy supply for the food chain (Cummins 1974 *cited in* Platts 1991). This allochthonous material provides an important food source for aquatic insects, that in turn, become prey for salmonids. Consequently, removal of riparian vegetation can affect the diet of fish by reducing production of both terrestrial and aquatic insects (Chapman and Demory 1963).

Substrate and Sediment

Damage to streams in the western United States from livestock grazing is largely due to the generation of excess sediment caused by livestock overuse of riparian areas (Waters 1995). Cattle or sheep trampling streambanks and the subsequent erosion adds fine sediments to stream substrates. Mass wasting of sediment occurs along streambanks where livestock walk on overhanging cut banks (Behnke and Zarn 1976; Platts and Raleigh 1984; Fleischner 1994). At great risk are salmonid spawning reaches used by anadromous Pacific salmonids and inland trout (Waters 1995). Increases in fine sediment lead to greater substrate embeddedness and a decrease in the interstial spaces between gravel substrate important for MCR steelhead spawning. Increases in substrate embeddedness impair food production as described above, and block refugia for young salmonids (Rinne 1990). A general reduction of the quality of spawning and rearing habitat available occurs in these circumstances. Salmonid survival at early life stages has been directly linked to the amount of surface fines in stream substrates (Rich *et al.* 1992, EPA 1993). Juvenile salmonids are dependent on clean substrate for cover, especially for over-winter survival (EPA 1993). Successful salmonid spawning requires clean gravels with low fine sediment content (Spence *et al.* 1996).

Peak/ Base Streamflow

Channel downcutting caused by riparian degradation can lower local water tables and reduce the volume of base flow available in dry seasons and periods of drought (EPA 1993). Riparian vegetation has been linked to the water-holding capacity of streamside aquifers (Platts 1990). As riparian vegetation is removed by livestock grazing and streamside soils are compacted by livestock hooves, the ability of areas to retain water is decreased. Johnson (1992) reviewed studies related to grazing and hydrologic processes and concluded that heavy grazing nearly always decreases infiltration, reduces vegetative biomass, and increases bare soil. Decreased evapotranspiration and infiltration increases and hastens surface runoff, resulting in a more rapid hydrologic response of streams to rainfall. When this occurs, high flows in the spring tend to increase in volume, leading to bank damage and erosion. Summer and fall base flows are decreased, often resulting in flows that are insufficient to provide suitable rearing habitat for juvenile salmonids. If aquifers lose their capacity to hold water and slowly deliver water to the stream, differences between peak and base discharge rates increases dramatically (EPA 1993). Some streams that typically flowed perennially may experience periods of no flow in the summer or fall. Li *et al*. (1994) found that streamflow in a heavily grazed eastern Oregon stream

became intermittent during the summer, while a nearby, well-vegetated reference stream in a similar-sized watershed had permanent flows. They suggested that the difference in flow regimes was a consequence of diminished interaction between the stream and floodplain with resultant lowering of the water table

Most riparian areas of the allotments addressed in this Opinion are not subject to densities of livestock sufficient to cause this degree of reduction in infiltration rates or change in streamflow regime. Experiments in northeastern Colorado showed reductions in infiltration in heavily grazed plots, but no differences between moderately and lightly grazed plots (Rauzi and Smith 1973). There are however, large meadow systems where livestock tend to congregate such as Flood Meadows in the Long Creek allotment and stringer meadow systems in the Murderers Creek allotment that could experience these types of effects if grazing is not tightly controlled.

Pool Quality/Quantity

Instream pools are important habitat for both juvenile and adult salmonids. Fish abundance is related to the diversity of habitats and number and quality of instream pools (EPA 1993). Rearing juvenile salmonids use slow water habitat found in pools, while adult salmonids make use of the cover and deep water found in pools during spawning migrations. Pools with undercut banks are important rearing areas for juvenile salmonids (Bjornn and Reiser 1991). These areas provide overhead cover and water velocities ideal for both juvenile and migrating adult salmonids. Bank trampling by livestock can destroy undercut banks, thereby reducing hiding cover for fish. Introduction of fine sediments to streams can fill in pools, reducing depth and covering coarse substrates. Reduction in the growth of woody species such as aspen and cottonwood along the stream's edge can lead to reductions in instream wood, thus diminishing the retention of spawning gravels and decreasing the frequency of pool habitats

2.1.5.3 Minimizing Effects from LAA Livestock Grazing

With the implementation of PACFISH in 1995, many riparian areas in the JDR basin have management programs in place to protect and enhance their condition. In an effort to avoid the abovementioned adverse effects that can result from improper livestock grazing, the MNF has made many adjustments to their range program. Many riparian areas are now fenced to exclude cattle. This is one, if not the most, effective technique to speed recovery and protect riparian areas from damage from livestock grazing. According to the BA, fishery biologists, hydrologists, and range conservationists indicate that the majority of the perennial streams located on the MNF-administered livestock grazing allotments are showing improving trends in grass, shrub growth, vigor, and streambank stability. These trends are noted through general observation and documented by photographs and riparian survey data.

Permitees rely on salting, herding, and upland water sources to keep cattle away from unfenced riparian areas. Some information is available on the effectiveness of these techniques, but for the most part, results are conflicting. Erhart and Hansen (1997) cited three studies done in Oregon on the effectiveness of upland water sources and mineral supplements on reducing use of stream areas by cattle. In two studies, cattle use of stream areas was reduced by the use of these techniques while another study demonstrated that these techniques did not significantly alter

cattle distribution in riparian areas. Riding and herding livestock away from riparian areas is a commonly used technique on Forest Service allotments. Observations made during site visits and the end-of-year range tour suggest that this technique works well on some allotments but not as well on others. However, no specific information or data has been collected to support these observations.

Placing salt or mineral supplements in upland areas is often used to decrease the amount of time livestock spend in riparian areas. McInnis and McIver (2001) found that off-stream water and salt attracted cows to the uplands enough to significantly reduce the development of uncovered and unstable streambanks from 9% in non-supplemented pastures, to 3% in supplemented pastures. Ehrhart and Hansen (1997) provide anecdotal evidence that salt, when used in conjunction with alternate water sources, can help distribute livestock over open range, however, they stress that the mineral supplements must be placed far from streams (greater than 1/4 mile). In contrast, Bryant (1982) and Martin and Ward (1973) found that salt placement away from riparian areas did not significantly alter the amount of time livestock spent in riparian zones. Both studies conclude that use of mineral supplements alone, will not influence livestock distribution appreciably.

Total rest from grazing can be one of the best alternatives for realizing rapid recovery of riparian areas (Leonard *et al*. 1997). The MNF is proposing rest for several allotments as well as several units of other allotments for rest in 2003.

Fencing of sensitive riparian areas is an effective way of protecting riparian resources, fish habitat and fish populations. Platts (1991) found that in 20 of 21 studies identified, stream and riparian habitats were degraded by livestock grazing, and habitats improved when grazing was prohibited in the riparian zone. Storch (1979) reported that in Oregon, in a reach of Camp Creek passing through grazed areas, game fish (trout) made up 77% of the population in a fenced exclosure, but only 24% of the population outside the exclosure. The existing fencing on the MNF allotments as well as the newly proposed fencing will protect some sensitive riparian from damage due to livestock grazing during the calendar 2003 grazing season.

Establishing utilization standards for residual stubble height, shrub use, and bank damage and moving livestock when these standards are approached or reached will help to avoid many of the adverse effects that improper livestock grazing can have on fish and their habitat. Permittees are expected to meet these standards each grazing season and the MNF rely on a monitoring plan to ensure compliance with these standards. Leaving 4 to 6 inches of residual stubble height will help protect streambanks from erosion during subsequent high flow events. It should also minimize livestock use of riparian shrubs that provide shade to streams. Limiting bank damage to less than 10% should prevent adverse changes to stream channel morphology and width/depth ratios. Pasture or unit rotations have been altered to minimize or eliminate the potential for livestock interference with MCR steelhead spawning. Damage to streambanks and riparian soils is minimized by delaying livestock turn-out until soils are relatively dry.

It should be pointed out that the best information available does not allow NOAA Fisheries to determine if the current MNF utilization standards are adequate to allow for attainment of RMOs

identified in PACFISH (USDA, USDI 1995). Setting proper utilization guidelines requires trial and error through focused monitoring, analysis, and evaluation of the results after adjusting management (Leonard *et al.* 1997). Current research on livestock grazing in riparian areas indicates that these utilization standards are a good place to start, however, monitoring is necessary to validate that riparian objectives are being met under current standards. The MNF is gathering this information, but it will be several more years until effectiveness monitoring results will indicate whether the current standards are sufficient to meet RMOs.

Compliance or implementation monitoring is essential to the success of any grazing program (Leonard *et al.* 1997). According to the BA, the MNF will adaptively manage allotments, changing livestock numbers, season-of-use, or rotation patterns if riparian utilization standards are not met. The MNF will rely largely on the IIT implementation monitoring program (USDA and USDI 2002) to direct monitoring efforts in the UJDR and MFJDR subbasins. Monitoring for and responding to instances of unauthorized use of livestock is also important. Leonard *et al.* (1997) point out that it only takes a few weeks of unauthorized use or overgrazing to set back years of progress in improving riparian systems.

Many authors have concluded that efforts of operators (permittees) and managers (in this case the MNF) are more important than any particular system or approach to meeting objectives for livestock grazing in riparian areas (Ehrhart and Hansen 1997). NOAA Fisheries believes that consistent and accurate monitoring of the MNF range program activities is essential to minimizing and avoiding take of MCR steelhead and meeting the requirements of PACFISH (USDA and USDI 1995).

2.1.5.4 LAA Allotment-Specific Effects

Long Creek Allotment.
Turnout of livestock will occur on this allotment on June 1 on the Flat Camp unit. MCR steelhead spawning occurs in Long Creek and Camp Creek within this unit. There is a potential for interference with MCR steelhead spawning and/or redd trampling in this unit. There are also several areas, such as stringer meadows along Camp Creek and the Flood Meadows area of Long Creek, in this allotment where livestock tend to congregate. Livestock will be controlled in these areas by riding and herding, and the new fence in the Flood Meadows area will decrease the livestock impacts to Long Creek in this area. Livestock numbers have also been reduced by 149 cow/calf pairs for the 2003 season to reduce the potential for adverse effects to MCR steelhead and riparian areas.

Lower Middle Fork Allotment.
Turnout of livestock on this allotment will occur in three units, Balance, Pizer, and Granite Boulder & Susanville on June 1. Interference with MCR steelhead spawning an/or redd trampling has the potential to occur in following streams located in these units: Sunshine Creek, Big Creek, Lost Creek, Granite Boulder Creek, Beaver Creek, Dry Creek, Wray Creek, Badger Creek, Myrtle Creek, Deep Creek, Elk Creek, and Coyote Creek. The MNF proposed monitoring efforts for grazing in the areas of this allotment burned by the Summit Fire in 1996. This is the first year grazing will resume on these areas.

Murderers Creek Allotment.
Turnout dates in all units of this allotment have been moved back several weeks from the 2002 turnout dates to avoid potential effects to MCR steelhead spawning activities in the Murderers Creek watershed. Turnout of livestock in 2003 will occur after July 15 in all units except the Frenchy Butte unit Turnout in this unit will occur on July 12, but cattle will be kept away from Deer Creek until July 15. Although the potential for interference with MCR steelhead spawning is low in this allotment, the MNF still determined that grazing on this allotment may result in incidental take of MCR steelhead through harm resulting from potential impairment of MCR steelhead habitat and stream channel conditions. Although the season-of-use has been shortened and additional protective measures and monitoring have been proposed for this allotment, the MNF concluded that the potential for some localized degradation of MCR steelhead habitat indicators is more than discountable.

Upper Middle Fork Allotment.
Livestock turnout in this allotment will occur after July 15, so interference with MCR steelhead spawning and the potential for redd trampling will be avoided. To address problems with over-utilization on this allotment during 2002, the Caribou, Butte, Deerhorn, and Upper Vinegar units will be rested this year. Also, the Austin and Lower Vinegar units will only be used for a short period (two weeks). The MNF concluded, however, that due to the heavy use this area received during the 2002 grazing season, activities associated with grazing during 2003 on this allotment have the potential to result in some localized degradation of MCR steelhead habitat indicators. The short season-of-use should keep any potential adverse effects to a minimum.

Mount Vernon/John Day/Beech Creek Allotments.
Turnout dates for three pastures, Beech On/Off, Ennis, and Bear Creek are prior to July 15. The potential for interference with MCR steelhead spawning and/ or redd trampling could occur in the following streams: East Fork Beech Creek, Clear Creek, Bear Creek, McClellan Creek, and Beech Creek. The MNF also concluded that, due in part to the long season-of-use, the chance of some localized degradation of MCR steelhead habitat indicators occurring on this allotment is more than discountable.

Dixie Allotment.
Turnout of livestock will occur on June 1 in the Standard Creek Unit of this allotment. The potential for interference with MCR steelhead spawning and/or redd trampling could occur in Standard Creek or its tributaries. The MNF concluded that some localized degradation of MCR steelhead habitat indicators on this allotment is more than discountable.

Rosebud Allotment.
Streams located on this allotment are tributaries of the SFJDR and are located above a natural fish passage barrier at Izee Falls. The MNF determined that, although no MCR steelhead are present in this allotment, the potential for adverse downstream effects to areas where MCR steelhead occur is not discountable. These adverse effects include increases in stream temperature and increases in fine sediment inputs. This determination was based on the fact that this allotment has consistently failed to meet utilization standards during the past five years. The MNF feels that these potential adverse effects can be avoided if the conservation measures are

followed and utilization standards are met. More restrictive conservation measures will be added if desired results are observed on this allotment during 2003. The MNF also committed to monitor this allotment more closely during the calendar year 2003 grazing season.

Sugarloaf Allotment.
Turnout of livestock will not occur in any units that contain streams with MCR steelhead spawning habitat prior to July 15 in this allotment. The MNF determined that, although MCR steelhead distribution is limited in this allotment, the potential for adverse downstream effects to areas where more MCR steelhead occur is not discountable. These adverse effects include increases in stream temperature and increases in fine sediment inputs. This determination was based on the fact that this allotment has consistently failed to meet utilization standards during the past five years. The MNF feels that these potential adverse effects can be avoided if the conservation measures are followed and utilization standards are met. More restrictive conservation measures will be added if desired results are observed on this allotment during 2003. The MNF committed to monitor this allotment more closely during the calendar year 2003 grazing season.

2.1.5.5 Summary of Effects

Improper or uncontrolled livestock grazing in riparian areas can have numerous and in some cases, severe adverse effects to fish and their habitat. Techniques such as salting, herding, riding, fencing, and development of off-site water that are incorporated into the proposed grazing plans by the MNF will help to minimize these potential adverse effects. In addition, allotment-specific measures such as reducing stocking rates, constructing new fences, and shortening season-of-use will lessen the impacts of grazing on riparian areas in the MFJDR and UJDR. Total rest of several allotments, as well as several units in other allotments will also help facilitate recovery of riparian areas within these allotments. It is reasonably certain that some localized degradation of MCR steelhead habitat indicators will occur on the LAA allotments. NOAA Fisheries believes that the proposed conservation measures for the 2003 grazing season are sufficient to keep this degradation to a minimum, and when assessed at a watershed scale, improvement of habitat indicators is expected. The MNF will continue to identify areas where riparian habitat is being impacted and adjust grazing practices accordingly.

2.1.6 Cumulative Effects

"Cumulative effects" are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation." The "action area" for this consultation is identified in section 1.6.2 of this Opinion.

The MNF identified no specific private or state actions that are reasonably certain to occur in the future that would affect MCR steelhead or their habitat within the action area. Significant improvement in MCR steelhead reproductive success outside of federally-administered land is unlikely without changes in grazing, agricultural, and other practices occurring within these non-federal riparian areas in the JDR basin. Given that the MCR steelhead is listed as threatened,

NOAA Fisheries assumes that non-federal land owners will take steps to curtail or avoid land management practices that would result in the take of MCR steelhead. NOAA Fisheries is not aware of any specific future actions which are reasonably certain to occur on non-federal lands. Until improvements in non-federal land management practices are actually implemented, NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years.

2.1.7 Conclusion

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the: (1) Definition of the biological requirements and current status of the listed species; and (2) evaluation of the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

NOAA Fisheries has determined that, when the effects of the subject actions addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of MCR steelhead. These conclusions were reached primarily because: (1) Most relevant aquatic habitat indicators on the MNF-administered livestock grazing allotments along the mainstem JDR and tributaries, the SFJDR and tributaries, and the MFJDR and tributaries, addressed in this Opinion are expected to be maintained under current grazing regimes and monitoring strategies, and relevant aquatic habitat indicators are improving in some pastures or units; (2) available MNF monitoring data indicate that implementation of current grazing season restrictions have resulted in improvement in riparian vegetation conditions on many allotments; (3) in those areas of allotments where the attainment of RMOs has been prevented by the recent grazing practices, the MNF has adjusted grazing practices or developed plans to prevent this in the future, including reducing season-of-use, reducing livestock numbers and fencing more riparian areas;
(4) although available data shows that some trampling of MCR steelhead redds may occur, and the percentage of redds potentially trampled can be high in certain channel types (meadow areas, C-type stream channels), improvements in the management of livestock on MNF-administered livestock grazing allotments containing or adjacent to MCR steelhead spawning areas are expected to minimize the number of redds trampled by livestock; (5) the Blue Mountain and Sullens allotments, which have had problems in the past will be rested in 2003; and
(6) improvements in riparian vegetation, stream shading, and streambank stability in many areas, and additional conservation measures developed for the 2003 grazing season, aquatic habitat

indicators such as water temperature, sediment, substrate embeddedness, width/depth ratio, and streambank condition are expected to be improved and be restored over the long term on JDR tributary streams. In reaching these conclusions, NOAA Fisheries has used the best scientific and commercial data available as documented herein and by the BA describing the federal actions.

2.1.8 Conservation Recommendations

Section 7 (a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species or to develop additional information. NOAA Fisheries believes that the following conservation recommendation regarding livestock grazing should be implemented:

1. Review the range improvement budget annually, and give top priority to restoring riparian areas along streams containing MCR steelhead habitat, by development of off-channel water sources and cattle-exclusion devices.

2. Review all allotments for opportunities to allow for rest, additional rest, or additional rest of high-priority pastures. Use the results of that review to reduce grazing impacts by making allotment management changes, such as more efficient grazing systems, restructuring pasture boundaries, and increasing the number of pastures within an allotment.

3. Manage the wild horse herd in the Murderers Creek area to meet levels established by the MNF Forest Plan. PACFISH (USDA and USDI 1994) set forth standards and guidelines for grazing management (GM). GM-4 states:

   > Adjust wild horse and burro management to avoid impacts that prevent attainment of RMOs or adversely affect listed anadromous fish.

   Information from the MNF range staff indicates that the herd is currently twice the size established by the MNF Forest Plan (Susan Burton, David Favre, MNF, pers. comm.). Observations made during site visits conducted 2001 and 2002 by the MNF and NOAA Fisheries indicate that wild horses, at the current population levels, are having adverse effects to RMOs in the Murderers Creek watershed.

4. The MNF should develop grazing plans for riparian pastures that place a focus on meeting RMOs. PACFISH GM-1 states:

   > Modify grazing practices (*e.g.* accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing) that retard or prevent the attainment of RMOs or are likely to adversely

affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting RMOs and avoiding adverse effects on listed anadromous fish.

There are many narrow riparian corridor pastures on the MNF that could benefit from more modern grazing management techniques such as rest rotation. The focus of management in these areas needs to shift to meeting RMOs rather than obtaining forage for livestock on a yearly basis.

5. Continue to review the location, relative impact, and current justification/need for existing, grazing program-related, federal water diversions on streams that provide spawning or rearing habitat for MCR steelhead. The MNF shall ensure proper operation of diversions to avoid impact to MCR steelhead. If necessary, reinitiate consultation for effects from grazing-related diversions for these allotments.

2.1.9 Reinitiation of Consultation

Reinitiation of consultation is required if: (1) The action is modified in a way that causes an effect on the listed species that was not previously considered in the BA or this Opinion; (2) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; (3) a new species is listed or critical habitat is designated that may be affected by the action; or (4) the amount or extent of take specified in the Incidental Take Statement is exceeded (50 CFR. 402.16). The MNF may also be required to reinitiate consultation if the proposed actions are not consistent with conservation measures developed through the pending consultation on land and resource management plans for federal land management units in the Mid- and Upper Columbia River basins. To reinitiate consultation, FS must contact the NOAA Fisheries Habitat Conservation Division, Oregon Habitat Branch and refer to **2003/00610** and/or **2003/00612**.

2.2 Incidental Take Statement

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. "Harass" is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement. An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to

minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of Take

NOAA Fisheries anticipates that the subject grazing actions covered by this Opinion are reasonably certain to result in incidental take of MCR steelhead. Some level of incidental take is expected to result from livestock grazing due to the potential for cattle to actually trample MCR steelhead redds, disturbance of spawning adult steelhead, or frightening of juvenile MCR steelhead from cover by livestock wading in streams. Some localized riparian disturbance is also reasonably certain to occur in the allotments addressed in this Opinion. Take of MCR steelhead could occur a result of increased stream temperatures, decreased dissolved oxygen levels, or smothering of eggs by fine sediments as a result of riparian disturbance caused by livestock grazing. Because of the inherent biological characteristics of aquatic species such as MCR steelhead, however, the likelihood of discovering take attributable to these actions is very small. Effects of actions such as those addressed in this Opinion are largely unquantifiable in the short term, and may not be measurable as long-term effects on the species' habitat or population levels. Therefore, even though NOAA Fisheries expects some incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take of listed fish at any life stage.

2.2.2 Effect of the Take

In this Opinion, NOAA Fisheries has determined that the level of anticipated take is not likely to result in jeopardy to MCR steelhead.

2.2.3 Reasonable and Prudent Measures

NOAA Fisheries believes the following reasonable and prudent measures are necessary and appropriate to minimize the likelihood of take of MCR steelhead resulting from the actions covered in this Opinion. The MNF shall:

1. Minimize the likelihood of incidental take resulting from livestock grazing and associated activities by managing livestock grazing allotments such that direct effects of livestock on spawning adult MCR steelhead, steelhead eggs, and pre-emergent fry in streams on or adjacent to those allotments are avoided or minimized.

2. Minimize the likelihood of incidental take resulting from livestock grazing and associated activities by managing livestock grazing allotments such that direct and indirect effects of livestock on important components of MCR steelhead habitat are avoided or minimized.

3. Complete a comprehensive monitoring and reporting program to ensure implementation of conservation measures found in this Opinion.

2.2.4 Terms and Conditions

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

1. To implement reasonable and prudent measure #1 (direct effects of livestock on spawning adult MCR steelhead, steelhead eggs, and pre-emergent fry), the MNF shall:

    a. Coordinate with the Level 1 team to develop written criteria to designate suitable steelhead spawning habitat and develop a written protocol for conducting steelhead spawning surveys. Implementation of the criteria and protocol should begin during 2003.
    b. Notify NOAA Fisheries within 24 hours of any instances of unauthorized use on allotments covered by this Opinion.
    c. When unauthorized livestock use[3] or excess use[4] occurs within stream reaches identified as MCR steelhead spawning habitat prior to July 15, the permittee will be notified to remove the livestock immediately. NOAA Fisheries Habitat Division, Oregon Habitat Branch, shall be notified within 24 hours. Livestock shall be removed promptly after NOAA Fisheries is notified.
    d. Conduct spawning surveys in all areas identified to be surveyed in the BA. Continue surveying those areas on allotments where steelhead spawning may occur but has not been verified.
    e. Maintain and ensure proper operation of all exclosure structures, such as fences, designed to protect MCR steelhead spawning and rearing.

2. To implement reasonable and prudent measure #2 (direct and indirect effects of livestock on important components of MCR steelhead habitat), the MNF shall:

    a. Consistently implement grazing-related standards and guidelines listed in PACFISH to achieve RMOs regarding bank stability, water temperature, large woody material, lower bank angle, width/depth ratio and other aquatic habitat parameters which may be affected by livestock grazing.
    b. If a utilization standard of four inches of residual stubble height is not sufficient to prevent unwanted browse of shrubs, increase the utilization standard for that unit to six inches or more of residual stubble height.

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[3] Unauthorized use is any incident whereby livestock owned by a non-permittee enter onto the National Forest System lands.

[4] Excess use is any incident whereby livestock owned by a permittee holding a grazing permit are found in areas or at times other than shown on the grazing permit or otherwise authorized under a bill for collection.

c. Meet all requirements and fully implement the 2000 Grazing Implementation Monitoring Module, 2002 amendments to the module, and the piloted Effectiveness Monitoring Module.
d. Meet implementation and effectiveness monitoring requirements developed by the Level 1 Team for specific pasture units.
e. Conduct move trigger monitoring on the Deer Creek unit of the Murderers Creek allotment at least once between August 1 and August 14, and then again as necessary until livestock are moved out of the allotment, to ensure utilization standards proposed in the BA are met.
f. Conduct monitoring in the portion of the Lower Middle Fork allotment that was burned in the Summit Fire. Suspend grazing if impacts and effects are beyond those analyzed in the BA.
g. Provide the necessary training for all permittees and range riders to monitor livestock use and pasture move "triggers" (stubble height, woody utilization, and bank damage), and to clearly understand objectives stated in the BA.

3. To implement reasonable and prudent measure #3 (monitoring and reporting), the MNF shall:

a. Provide an end-of-year report to NOAA Fisheries by January 6 of each year. The MNF shall follow the End-of-Year report template agreed upon by the MNF Level 1 Team. The following shall be included in the report for each allotment:
   i. Overview of proposed action and actual management (livestock numbers, on-off dates for each pasture, and strategy);
   ii. specific MNF implementation monitoring data, date, and location collected (stubble height, woody use, bank damage, unauthorized use, and fence maintenance);
   iii. specific permittee monitoring data;
   iv. review of management and compliance successes and failures and any transmittals/letters/actions addressed to/from permittees;
   v. new habitat trend or MCR steelhead population data;
   vi. compliance with each pertinent term and condition contained in this Opinion; and
   vii. management recommendations for subsequent years.
b. Use a Forest-wide interdisciplinary team, consisting of a fish biologist, hydrologist, and range conservationist, to develop specific, consistent protocols for measuring residual stubble height, bank damage, and shrub use. Provide the members of this team with any necessary training prior to start of the grazing season.
   i. Identify one or more DMA for each unit and conduct verification monitoring on a randomly selected 10% sample of those allotments monitored during 2003 grazing season. The purpose of this monitoring will be to assess consistency and accuracy of monitoring conducted during 2003. This monitoring will need to occur after the initial utilization standard or IIT monitoring is completed.

c. Prepare and submit checklist to the Level 1 Team summarizing all the monitoring and survey efforts proposed in the BA and required by this Opinion. This will allow the interdisciplinary monitoring team (as described by term and condition 3(b)) and the Level 1 Team to track monitoring efforts throughout the grazing season and ensure all required and proposed monitoring is completed.

d. Conduct a mid-year grazing tour in July with the NOAA Fisheries, USFWS, and ODFW. The tour's purpose is to review ongoing grazing activities and assess compliance with the requirements of this Opinion and the conservation measures identified in the BA. A summary of the grazing tour will be develop by the Level 1 Team and provided in the end-of-year grazing monitoring report.

e. Provide an end-of-year grazing tour in the fall with the NOAA Fisheries, USFWS, and ODFW. The tour's purpose is to review successes and failures of the current year's grazing activities, and develop recommendations for future activities. A summary of the grazing tour will be provided in the end-of-year report.

f. Provide information, including allotment maps and spawning survey data, to be used by NOAA Fisheries Oregon Habitat Branch personnel during site visits to assess impacts of the 2003 grazing activities on MCR steelhead. Site visits may occur at any time during the 2003 grazing season.

g. Identify all pastures used for livestock gathering and holding that contain streams that provide rearing or spawning habitat for MCR steelhead. The MNF shall visit each of these units and conduct a review of current habitat conditions that affect MCR steelhead (upslope, riparian, and instream) as influenced by past and current grazing practices. Provide specific results and management recommendations in the end-of-year report to the NOAA Fisheries and update specific allotments' baseline conditions with any new information.

h. Send the completed report to:

National Marine Fisheries Service
Oregon Habitat Branch
ref. 2003/00610, 2003/00612
Attn: Eric Murray
3502 Highway 30
La Grande, OR 97850

i. NOTICE. If a dead, injured, or sick endangered or threatened species specimen is found, initial notification must be made to the National Marine Fisheries Service Law Enforcement Office, at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360.418.4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. Besides the care of sick or injured endangered and threatened species, or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by

Law Enforcement to ensure that evidence with the specimen is not unnecessarily disturbed.

3. MAGNUSON-STEVENS ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in federal fishery management plans. In addition, the MSA requires federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA section 3). For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem, and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;

- NOAA Fisheries shall provide conservation recommendations for any federal or state activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and up slope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The PFMC has designated EFH for three species of Pacific salmon: Chinook salmon (*O. tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). In estuaries and marine areas, designated salmon EFH extends from the near shore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border. Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Actions

The proposed action is detailed above in section 1.2 of this document. The action area is identified in section 2.1.4 of the ESA portion of this document. These areas within the UJDR and MFJDR subbasins have been designated as EFH for various life stages of chinook salmon.

3.4 Effects of Proposed Action

As described in detail in the ESA portion of this consultation**,** the proposed activities may result in detrimental short-term adverse effects to a variety of habitat parameters.

3.5 Conclusion

NOAA Fisheries believes that the proposed action will adversely affect the EFH for chinook salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the FS, all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.3 and 2.2.4 are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

The MNF must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries= EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion in addition to the BA and additional information requested by NOAA Fisheries and provided by the UNF, WWNF, and MNF.

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