United States Department of Agriculture

Forest Service

Pacific Northwest Region

Steelhead Biological Assessment November 2022

Beech Creek On/Off Allotment

Blue Mountain Ranger District,
Malheur National Forest
Grant County, Oregon

for the greatest good

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Cover Photo: E.F. Beech Creek in the Beech Creek On/Off Allotment.

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Grant County, Oregon

Prepared for:
United States Department of Agriculture
Forest Service
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November 15, 2022

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EXECUTIVE SUMMARY

This Biological Assessment (BA) covers the Beech On/Off Allotment in response to re-initiation of grazing consultation for Mid-Columbia River (MCR) steelhead (Oncoryhnchus mykiss) listed as threatened under the Endangered Species Act. The action area for this consultation includes all areas to be affected directly or indirectly by the federal grazing actions and includes the lower portion of East Fork Beech Creek sub-watershed (12 digit Hydrologic Unit Code (HUC) 170702010801), and portions of the Upper (170702010801) and Lower Beech Creek sub-watersheds (HUC 170702010803). The larger 8 digit HUC which encompasses the action area is the Upper John Day sub-basin (HUC 17070201), with a small portion of the allotment including the Timber Pasture (no Critical Habitat) in the North Fork John Day sub-basin (HUC 17070202). The 10 digit HUC watershed is Beech Creek (1707020108) for all pastures except Timber, which is in the Cottonwood Creek (1707020209) watershed of the North Fork John Day Basin. The consultation is proposed to cover the next five years (2023-2027) of livestock grazing.

The proposed actions on the Beech On/Off allotment are inter-related to the Mt Vernon and John Day allotments, which are used together to create an overall rotational grazing system, along with the private lands of the permittee. There is a total of 15.2 miles of designated Critical Habitat (CH) for Mid-Columbia River summer steelhead in these allotments (Mt. Vernon 4.8 miles, John Day 9.2 miles, and Beech On/Off 1.3 miles). The CH and Most Sensitive Area (MSRA) in the Beech On/Off allotment total 1.46 miles and 1.35 miles, respectively.

The Malheur National Forest received a Biological Opinion (BO) on June 1, 2018 (Reference: WCR 2018/9125) for grazing consultation on the allotment for years 2018-2022. The ESA consultation call for this period was “May Affect, Likely to Adversely Affect” (LAA). A The Malheur National Forest is submitting this updated BA for the 2023-2027 period.

The environmental baseline for the Upper John Day Basin (8 digit HUC) as defined by the Matrix of Pathway Indicators has zero indicators Properly Functioning, four indicators Functioning at Risk (nutrients as identified by a stream segment listed under Clean Water Act 303d standards; amount of off-channel habitat, stream bank condition, and disturbance history), and 13 indicators Functioning at Unacceptable Risk (temperature, physical barriers, substrate, large woody debris, pool frequency, pool quality, refugia, percent fines, floodplain connectivity, changes in peak/base flows, increases in drainage network, road density and locations, and riparian management areas).

The environmental baseline for the Beech Creek watershed (10 digit HUC) as defined by the Matrix of Pathway Indicators has zero indicators Properly Functioning, six indicators Functioning at Risk (nutrients as identified by stream segments listed under Clean Water Act 303d standards, amount of off-channel habitat, stream bank condition, change in peak/base flows, road density and location, and disturbance history), and 11 indicators Functioning at Unacceptable Risk (temperature, physical barriers, substrate, large woody debris, pool frequency, pool quality, refugia, percent fines, floodplain connectivity, increases in drainage network, and riparian management areas).

The status of steelhead in the Upper Mainstem John Day Basin is documented as of intermediate population size and is not rated as fully viable, which is required for contribution to recovery of the species. Spawning and rearing habitat in the action area includes Beech Creek, East Fork Beech Creek and McClellan Creek.

Previous BAs for these inter-related allotments (MNF 2011) determined that the effects for the proposed grazing actions were Likely to Adversely Affect (LAA) based on potential negative and measurable effects to the indicators of temperature, sediment, substrate embeddedness, refugia, and large woody debris, which correspond to the Primary Constituent Elements (PCEs) (now termed Physical or Biological Features or PBFs) of critical habitat related to freshwater spawning and rearing of steelhead. This Biological Assessment determines that the effects from the proposed actions are Likely to Adversely Affect based on effects to the indicators of temperature, sediment, substrate embeddedness, and refugia. The potential presence of cattle in Critical Habitat during the steelhead spawning season, also factors into the LAA determination in Beech On/Off Allotment.

The previous five years of monitoring identified no end point indicators that were not met or were exceeded on the MIM DMA in the Beef Pasture on Beech On/Off Allotment.

The consultation is proposed to cover the next five years 2023-2027.

The proposed action for Beech On/Off Allotment for the next five years is to use each of the four pastures for two to three weeks as described in Section 6.2 of this BA.

Three BAs are being submitted for these interrelated allotments. Based on analysis of the proposed project actions in the three allotments, with a local environmental baseline with streams that does not meet steelhead rearing and migration temperatures of <68F on East Fork Beech Creek, McClellan Creek, Clear Creek, and Thompson Creek; high percent fines on the majority of reaches of Clear Creek and McClellan Creek, exposure of Critical Habitat to grazing in these allotments during the months of June, July, August, and September, the effect determinations for the listed species and critical habitat are as follows:

Beech On/Off Allotment	**LAA Steelhead**	**LAA Critical habitat**
Mt Vernon Allotment	**LAA Steelhead**	**LAA Critical Habitat**
John Day Allotment	**LAA Steelhead**	**LAA Critical Habitat**

1 INTRODUCTION

The Blue Mountain Ranger District (BMRD) of the Malheur National Forest (MNF) proposes to re-authorize livestock grazing for the next five seasons, 2023-2027, on the Beech Creek On/Off Allotment. Consistent with the Endangered Species Act (ESA) and its implementing regulations, this Biological Assessment (BA) documents the analysis and conclusions of the Forest Service (FS) regarding the effects of implementing the livestock grazing it intends to authorize during that period. The analysis in the BA evaluates the effects on: (1) the Middle Columbia River Steelhead Distinct Population Segment (DPS) listed by the National Marine Fisheries Service (NMFS) as Threatened; and (2) designated critical habitat (CH) for the DPS (Table 1). This BA is prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2672.4, and ESA section 7 regulations.

Table 1. Federally-Listed Species that occur in or near the action area and ESA effect determinations for the species and designated CH (LAA = May Affect, Likely to Adversely Affect).

Common Name	Scientific Name	Jurisdiction Agency	Federal Status	Critical Habitat	ESA Effect Determination Species/CH
Middle Coulumbia River Steelhead	Oncorhynchus mykiss	NMFS	Threatened	Designated	LAA/LAA

1.1 ESA ACTION AREA SUBWATERSHEDS AND STREAMS

The ESA Action Area includes all areas to be affected directly or indirectly by the federal grazing actions and as such includes the hydrological watersheds bounding the allotment, and within the watersheds includes designated critical habitat (CH), as well as non-critical habitat streams and wetland or riparian areas tributary to the critical habitat.

The Beech Creek On/Off Allotment includes approximately 1,633 acres of National Forest System (NFS) land and approximately 3,000 acres of private land run congruent with the NFS land. The allotment is located within the North Fork John Day and Upper John Day sub-basins (8-digit Hydrologic Unit Code (HUCs)). Only the Timber Pasture is within the North Fork John Day sub-basin, and it is approximately 1 mile above Critical Habitat designated on McHaley Creek. Most of the allotment is in the Beech Creek ten-digit HUC watershed, with the Timber Pasture in the Cottonwood Creek ten digit HUC watershed. The Upper Beech Creek, Lower Beech Creek, East Fork Beech Creek sub-watersheds comprise most of the drainage from the pastures, with the Timber Pasture located in the McHaley Creek sub-watershed (12-digit HUC) of the North Fork John Day sub-basin. The twelve-digit HUCs are provided in Table 2, and are the smaller sub-watersheds that make up the action area. Most Sensitive Riparian Areas (MSRA) are miles identified in the previous consultation as part of the response to grazing litigation, and are used to identify stream sections that are most vulnerable to livestock impacts as well as steelhead and livestock interaction.

The John Day and Mt Vernon allotments also occur in the Upper John Day and North John Day sub-basins, and the Beech Creek (1707020108), Laycock-Creek John Day River (1707020109), Fields Creek - John Day River

(1707020110), and Cottonwood Creek (1707020209) ten digit HUC watersheds. The 12 digit HUCs are presented in each respective BA.

Table 2. Beech Creek Allotment 6th Field HUCs, Streams, River Miles, Critical Habitat, and MSRA Miles.

Subwatershed (6th Field)	6th Field HUC	Stream	Action Area (River Mile)	Steelhead Critical Habitat Miles	MSRA Miles
Upper Beech Creek	170702010801	Little Bear Creek	0.58	0	0
		Unnamed Tributary to Bear Creek	0.15	0	0
		Unnamed Tributary to Beech Creek	0.20	0	0
East Fork Beech Creek	170702010802	East Fork Beech Creek	1.59	1.34	1.34
		Thompson Creek	0.44	0	0
Lower Beech Creek	170702010803	Laycock Creek	0.66	0	0
McHaley Creek	170702020903	Unnamed Tributary to McHaley Creek	0.25	0	0
		Unnamed Tributary to McHaley Creek	0.14	0	0
Total miles			**4.01**	**1.34**	**1.34**

1.2 CONSULTATION HISTORY

Past and ongoing informal and formal consultations that overlap the ESA action area and the 6th field HUC sub-watersheds of the Beech Creek allotment are described in this section.

1.2.1 Recent and Ongoing Associated ESA Consultations

Blue Mountains Expedited Section 7 Consultation Process

The three Blue Mountain National Forests (Umatilla, Wallowa-Whitman, and the Malheur) and the Vale and Prineville BLM Districts consulted with NMFS and FWS on the effects of a subset of forest management projects with a set of project design criteria (PDC) as a Programmatic Informal Consultation on listed animal and plant species in the action area called Blue Mountain Expedited Section 7 Consultation Process (BM-PDC).

Informal consultation has been concluded by both NMFS and USFWS (collectively "the Services") on the categories of MNF actions addressed by the programmatic to listed fish species and designated critical habitat. On May 31, 2007, the MNF received a concurrence letter from NMFS (2007/02970) regarding effects to both listed MCR steelhead and their designated critical habitat. Additionally, informal consultation with USFWS was concluded regarding effects to Columbia River (CR) bull trout and their designated critical habitat on June 04, 2007 (TS Number 07-1661; TAILS: 13420-2007-I-0154) and on July 30, 2010 (TS Number 10-1262; TAILS: 13420-2010-IC-0150), respectively.

Informal consultation was reinitiated in 2013 on the BM-PDC and was concluded by both NMFS and USFWS on the categories of MNF actions addressed by the programmatic process. On November 1, 2013, the MNF received a concurrence letter from NMFS (NWR-2013-10339) regarding effects to both listed MCR steelhead

and their designated critical habitat. Additionally, informal consultation with USFWS was concluded regarding effects to CR bull trout and their designated critical habitat on November 1, 2013 (TAILS Number 01EOFW00-2013-I-0173). The BA was amended to fix several small errors and omit the Gray wolf, and submitted to the Services on January 29, 2015.

Malheur National Forest Road Maintenance

Currently, the MNF consults on road maintenance specific to actions that are included in vegetation management projects.

Livestock Grazing Consultations

The Malheur National Forest (MNF) received a Biological Opinions on April 2, 2012 (reference number 2011/05362) for grazing on the allotment from 2012-2016 and June 1, 2018 (Reference: WCR 20118/9125) for grazing consultation on the allotment for 2018-2022. The ESA consultation call for 2018-2022 was "*May Affect, Likely to Adversely Affect"* (LAA) due to measurable and negative effects to the indicators of temperature, sediment, embeddedness, large woody debris, and refugia.

Litigation over previous compliance has occurred on this allotment in the past. The MNF was challenged by Oregon Natural Desert Association (ONDA), the Center for Biological Diversity, and Western Watersheds Projects in 2007 on the adequacy of the 2007-2011 MCR steelhead Biological Opinions, and the MNF's compliance with the Biological Opinion and Forest Plan Standards (PACFISH) for 13 allotments with ESA listed MCR steelhead. The court ruled in 2010 that the MNF failed to comply with the PACFISH standards, violated the ESA, and failed to reinitiate consultation following violation of the Take Statement. The Biological Opinion, which had also been challenged was upheld. Ten allotments were banned (permanently enjoined) from grazing in December 2010, until the permanent injunction was modified to only apply to two allotments and five pastures in three additional allotments.

The various legal challenges (including one filed in 2008 by permittees over the Biological Opinion) were consolidated as ONDA III, also commonly referred to as the "Tidwell case". Much of the case was lost over the MNF's failure to conduct adequate monitoring in 2007 and 2008, and over the failure to adequately evaluate the standards to determine whether steelhead habitat is recovering at a "near natural rate". The court noted that violation of the Incidental Take Statement was likely due to inadequate monitoring by the MNF. The court also pointed out that the MNF's grazing strategy "passed muster as it sets up an enforcement process that is triggered by certain criteria (i.e. by the exceedance of the bank alteration standard)." The grazing strategy included the allotment specific standards such as stubble height, woody browse use, and streambank alteration, and required the use of monitoring and conservation measures as well as the use of fencing and active herd management. The court understood that the MNF implemented grazing strategies by incorporation into grazing authorizations and the strategy's measures are binding on the permittees, requiring them to move livestock when move triggers are reached prior to exceeding endpoint indicators. This updated BA for grazing consultation (2023-2027) is part of the requirements for the MNF to meet the intent of the ESA section 7 with respect to conservation and recovery of listed species and preventing violation of section 9 of the ESA (the "take" provision).

Aquatic Restoration Biological Opinion

The FS and BLM concluded a region-wide formal consultation with the NMFS (April 25, 2013, NMFS reference no. NWP-2013-9664) on aquatic restoration activities for administrative units in Oregon and Washington including the MNF. The NMFS aquatic restoration biological opinion II (ARBO II) updates a prior formal consultation on similar activities that expired in 2012. The USFWS also issued an ARBO II opinion to the FS

and BLM for the same activities on July 1, 2013 (USFWS reference no. 01EOFW00-2013-F-0090). ARBO II provides coverage for 20 aquatic restoration program activity types.

The ARBO II has been used to cover consultation on a variety of aquatic restoration activities across the MNF since consultation conclusion. The categories of aquatic restoration from the ARBO consultation that may be implemented in this action area according to specific project design criteria include: off-channel livestock water facilities, livestock fencing, and instream large wood placement. A search of the database indicated that one project is planned for the area that includes this allotment.

Magone Project Aquatic Species Biological Assessment

Two of the pastures in the Beech On/Off Allotment occur on the edge of the Magone planning area, Patterson and Beef pastures. The Magone project is a much larger area entirely within the Upper John Day sub-basin. The primary proposed activities of the Magone project are silviculture treatments on 13,378 acres, including: 7,184 acres of commercial timber harvest; 5,918 acres of commercial and non-commercial thinning to create strategic fuel breaks; re-designation of stands on 223 acres for replacement Old-Growth, and post and pole removal in 292 acres. There will be no timber felling or silviculture treatments within Riparian Habitat Conservation Areas (RHCAs) for Magone project. Fuel treatments within 8 burn blocks will take place over the next 20 years. The primary activities for fuel treatments are underburning to create mosaic burn patterns, and pile burning. There are no planned ignitions within RHCAs, however fuel treatments prescriptions allow fire to back down into RHCAs.

The temporary opening of 47 miles of closed roads in 68 road segments for the entire project area is necessary to remove and treat the vegetation (1.16 miles within the RHCA of category 1 Tinker Creek, 1.57 miles Category 2 RHCA and 0.26 miles within the RHCA of category 4 streams). The new temporary construction of 13 miles of road in the total project area to access several timber units is part of the proposed action. Those roads will be rehabilitated and removed after project use (within 5-10 years).

The primary activities that may affect ESA listed steelhead that are analyzed in the Magone BA are: road maintenance needed on 78 miles of temporary roads as part of the haul routes; the opening and use of closed roads (mentioned in the paragraph above); the construction of new temporary roads (mentioned in the paragraph above); and associated crossings and timber haul. Any activities that have no effect on listed fish were not further analyzed, with the exception of one new trail crossing on EF Beech Creek 1 mile above MCR Steelhead CH.

The Final BA was submitted 12/6/16 to NMFS as a separate consultation. The Letter of Concurrence was received on April 5, 2017 with NMFS reference number WCR-2017-6599.

1.3 DESCRIPTION OF THE PROJECT AREA

The Beech Creek Allotment is north of Mt. Vernon, Oregon with small pastures on both sides of State Highway 395. Portions of it border the John Day Allotment, and as discussed previously it falls into two 8 digit HUC subbasins (North Fork John Day and Upper John Day). The pastures occur in two 10 digit watersheds, Beech Creek (Upper John Day sub-basin) and Cottonwood Creek (North Fork John Day sub-basin); and in four 12 digit (6th Field) sub-watersheds, Upper Beech Creek, Lower Beech Creek, East Fork Beech Creek (all in the Upper John Day sub-basin) and McHaley Creek (North Fork John Day sub-basin).

Elevations within the allotment range from approximately 4,500 feet in the Timber pasture feet to 3,700 feet in the Grouse Creek pasture. Vegetation types vary from ponderosa pine to mixed conifer. Portions of the allotment

are considered shrub/grass communities. The dominant grass species are bluebunch wheatgrass/Idaho fescue on the open hill slopes and elk sedge/pinegrass in forested areas.

The watersheds encompassing the Beech Creek Allotment support a mix of National Forest System and private lands. To the north of the Patterson and Beef allotment pastures is the Magone planning area, which encompasses a larger portion of East Fork Beech Creek (and adjacent creeks), and is being analyzed for restoration activities as part of the Magone Project NEPA decisions.

Several thousand acres of private land (mostly south of the pastures) are congruent with lands managed by the MNF, making this an On/Off allotment. On/Off permits are issued when a minor portion, usually less than 1/3, of a logical grazing area is composed of NFS lands. The intent is to promote efficient use of intermingled ownership, while at the same time achieving desired conditions of NFS lands. Under an On/Off permit the management of private lands is not waived to the Forest Service.

The allotment has four pastures: Beef, Patterson, Timber, and Grouse Creek (see Appendix A map). Each pasture contains both private and NFS lands. The Beef and Patterson pastures are the only pastures of this allotment that contain CH. The Beef pasture contains approximately 1.34 miles of CH and MSRA. The Patterson pasture contains approximately 0.018 miles (90ft) of CH and MSRA which is used as a water gap for the pasture. In 2017, this water gap was reduced to about 15 feet. In general, MSRAs are areas the MNF has identified as the most accessible and sensitive to livestock impacts within streams containing steelhead CH. MSRA is not a land-use designation, but instead is referenced in the Biological Assessment to facilitate the Forest Service's analysis of impacts and provide a useful basis for focusing attention on areas the agency has already determined may be the most susceptible to causing adverse impacts to the listed fish from grazing.

Important aquatic species within the action area, in addition to MCR Steelhead include: spring Chinook salmon (*Oncoryhnchus tshawytscha*), redband (*Oncoryhnchus mykiss gairdneri*), Pacific lamprey (*Entosphenus tridentatus*), sculpin (*Cottus* sp.), and potentially three species of freshwater mussel; California floater (*Anodonta californiensis*), western ridged mussel (*Gonidea angulate*), and the shortface lanx (*Fisherola nuttali*).

Other Activities in The Project Area: Activities that have occurred or continue to occur within these watersheds include timber harvest, grazing, road and trail use, water diversions, prescribed and natural fire, noxious weed treatment, and recreation (hiking, hunting, off-road-vehicle use, driving for pleasure, camping, cross-country skiing, and horseback riding). Aquatic restoration occurred over the past five years and is summarized in Table 3 below.

Table 3. Beech Creek Watershed Aquatic Restoration Accomplishments from 2017-2022.

Year	Stream	Restoration Treatment	Road	Stream Miles/Accessible
2018	East Fork Beech Creek	AOP Improvement	3600 935	3.4
2017	East Fork Beech Creek	Large Wood Placement		1.6

Specific restoration projects in the allotment occurred on East Fork Big Creek from 2017-2018 including an AOP culvert replacement improving passage and access to 3.4 miles of stream and 1.6 miles of large-wood additions (Reach 3 and Reach 5) located within the Beef and Patterson pastures of the Beech Creek allotment.

1.4 FOREST PLAN DIRECTION AND POLICIES GUIDING THE ACTION

Forest plan direction and policies provide a management framework that directs and guides development and implementation of grazing actions on the Malheur National Forest. This section (1.4) of the BA is included to help inform the reader on the various Forest Plan Directions and Policies that have helped guide the development of the proposed actions outlined below (Section 6). This section is not the proposed action.

The original Malheur National Forest Land and Resource Management Plan (LRMP) of 1990 contained Forest Goals, Desired Conditions, and Forest-wide Standards, along with 22 Management Areas (each with different management goals, resource potentials, and limitations, see below). The 1990 plan established General Forest (MA 1) as a common area, along with Rangeland (MA 2) and Anadromous Riparian Areas (MA 3B). Included in those MA 3B areas are Class IV streams (intermittent streams that are not perennial), upland riparian areas, such as seeps, springs, meadows, and bogs, which have high water table conditions during some parts of the growing season. Class IV channels (intermittent streams that are not perennial) are to be recognized as important links between the uplands and downslope perennial streams. Per the LRMP they will be managed to ensure bank and channel stability.

Since 1990 the Forest Plan has been amended many times, most significantly by PACFISH (USDA FS and USDI BLM 1995) and INFISH (USDA 1995a) and Amendment 29 (MNF 1994), which used updated information to establish direction to restore and protect habitat for listed fishes.

1.4.1 Malheur National Forest Land Resource Management Plan (LRMP)

The MNF LRMP (MNF 1990) contains Forest-wide goals, objectives and specific Forest Management Area standards that provide direction with respect to fish and wildlife, range management, anadromous riparian areas and other resources.

Goals 15, 16, 17, 18, and 19 on page IV-2 apply to the Fish and Wildlife management:

- 15. Assist in the identification, protection and recovery of threatened, endangered, and sensitive species.
- 16. Coordinate fish and wildlife management activities with other agencies and organizations to achieve mutual resource goals and utilize project cost share opportunities.
- 17. Provide for maintenance and enhancement of big-game habitat so as to sustain elk and deer populations at the state management objective level.
- 18. Provide for improved fish habitat conditions to support increased populations of anadromous and resident fish.
- 19. Provide a diversity of habitat sufficient to maintain viable populations of all species.

Goals 20, 21, and 22 on page IV-2 apply to the Range management:

- 20. Provide a sustained production of palatable forage for grazing by livestock and dependent wildlife species.
- 21. Manage rangelands to meet the needs of other resources and uses at a level which is responsive to site-specific objectives.
- 22. Permit livestock use on suitable range when the permittee managing livestock is using prescribed practices.

The Goal for the MNF LRMP Anadromous Riparian Areas (MA3B) states:

"Manage riparian areas to protect and enhance their value for wildlife, anadromous fish habitat, and water quality. Manage timber, grazing, and recreation to give preferential consideration to anadromous fish on that portion of the management area "suitable" for timber management, grazing, or recreation. Design and conduct management in all riparian areas to maintain or improve water quality and beneficial uses".

Important Fish and Wildlife Standards of MA3B are standards 5, 8, and 10 on page IV-63:

- Standard 5 - Provide the necessary habitat to maintain or increase populations of management indicator species with special emphasis on steelhead.
- Standard 8 - Manage the composition and productivity of key riparian vegetation to protect or enhance riparian dependent resources. Emphasis will be on reestablishment of remnant hardwood shrub and tree communities.
- Standard 10 - Improve the rate of recovery in riparian areas that are not in a condition to meet management objectives by eliminating or reducing the impacts of management activities that may slow riparian recovery.

Important Range Standards of MA3B are standards 15-22 on pages IV-64-65:

15. Grazing allotments with riparian areas in less than desirable condition will be identified and updated according to the schedule shown in Activity Schedule A-10. Activity Schedule A-10 is an outdated list in the 1900 Forest Plan and has been replaced with an updated range National Environmental Policy Act (NEPA) schedule in Appendix E.

16. Include in allotment management plans (AMPs) a strategy for managing riparian areas for a mix of resource uses. Establish a measurable desired future riparian condition based on existing and potential vegetative conditions. When the current riparian condition is less than that desired, objectives will include a schedule for improvement. AMPs will identify management actions needed to meet riparian objectives within specific timeframes. Measurable objectives will be set for key parameters, such as amount of stream surface shaded, streambank stability, sedimentation, cover provided by trees, shrubs, forbs, and grass/grasslike vegetation. This process is described in "Managing Riparian Ecosystems (Zones) for Fish and Wildlife in Eastern Oregon and Washington" (Oregon/Washington Interagency Wildlife Committee 1979). The AMP will specify the monitoring needed to determine if the desired rate of improvement is occurring. AMPs currently not consistent with this direction will be developed or revised on a priority bases as shown in Activity Schedule A-10 of the 1990 LRMP (now out dated). Page IV-64.

17. Using Activity Schedule A-10 and available funding, prepare Allotment Management Plans for every grazing allotment on the Malheur National Forest as soon as possible. This process will use information gathered through the range allotment analysis activity, including the analysis of the management situation. Prepare an allotment management plan for each allotment that provides the techniques to reach an agreed upon interdisciplinary desired future condition. Establish resource value ratings and the range resource management level needed to reach the desired future condition. Use Table IV-5 to establish utilization levels for grass/grasslikes and shrubs by range resource management level. Inventory existing conditions to determine of the riparian area is satisfactory or unsatisfactory. Page IV-64.

18. Establish annual forage utilization requirements for each grazing allotment as a tool to achieve or maintain the desired condition. Use the forage utilization standards as shown in Table IV-4, except where site-specific monitoring information shows that a higher level of utilization will achieve the desired future condition without delaying the rate of improvement. As a minimum, the desired condition must be "satisfactory". Employ all available methods to achieve the desired levels of utilization by permitted livestock and big game. In cooperation

with Oregon Department of Fish and Wildlife establish riparian area carrying capacity of big-game. Limit game populations to the level necessary to achieve riparian objectives for all riparian resources. Special emphasis needs to be placed on big game riparian winter range management. Design the methods selected for controlled livestock use to fit the site-specific requirements for improving the riparian area to desirable condition. Any one or a combination of methods may be used to treat less than desirable areas, such as corridor fencing, herding, additional water developments, salting, nonuse for resource protection, early and late season use, short-term grazing rather than season long, reduced livestock numbers, control of degree of use, and/or creating additional pastures through fencing. Pages IV-64-65.

19. Manage allotments to protect or enhance riparian-dependent resources. Page IV-65.

20. Manage livestock grazing so that water quality meets Oregon State standards and fish populations are maintained at an acceptable condition or in an upward trend. Page IV-65.

21. Maintain sufficient streamside vegetation to maintain streambank stability and fish habitat capability. Page IV-65.

22. Restrict season long grazing, unless specifically evaluated and approved through the environmental analysis process. Page IV-65.

Following standard 22 the MNF LRMP displays the following table (Table 4) regarding forage utilization in riparian areas.

Table 4. Allowable Utilization of Available Forage in Riparian Areas (% Allowable use of available forage) (page IV-65 LRMP)

	Grass and Grasslikes1		Shrubs2	
Range Resource Management Level	S3	U4	S	U
Strategy B- Stewardship Management5	40	0-30	30	0-25
Strategy C- Extensive Management6	45	0-35	40	0-30

1. Utilization based on percent removed by weight.
2. Utilization based on weight and twig length. Example if 2/3 of the available leader length is removed, then browse utilization is 50% (USDA-FS-PNW-RN-472, April 1988).
3. Satisfactory Condition: On suitable range, forage condition is at least fair, with stable trend, and allotment is not classified PC (basic resource damage) or PD (other resource damage).
4. Unsatisfactory Condition: Allotment does not meet criteria for satisfactory condition
5. Management controls livestock numbers so that livestock use is within present grazing capacity. Distribution is achieved through riding, herding and/or salting. Improvements are minimal and constructed only to the extent needed to cost effectively maintain stewardship of the range in presence of grazing.
6. Management seeks full utilization of forage available to livestock. Cost-effective management systems and techniques, including fencing and water development, are designed and applied to obtain relatively uniform livestock distribution and use of forage to maintain plant vigor.

The LRMP direction described above is intended to provide many conservation benefits to ESA-listed MCR steelhead and designated CH by directing standards that must be met during management actions in anadromous riparian areas.

Other components of the forest management framework (MNF LRMP) that guide the development of the proposed action are discussed below under the Forest amendments sections of the BA. The most pertinent amendments to the MNF LRMP for aquatic objectives are PACFISH/INFISH and Amendment 29. Both the LRMP and the amendments are still the current direction for guiding grazing management.

1.4.2 LRMP Amendment 29 Desired Future Conditions

The MNF Land and Resource Management Plan (MNF 1990) was amended in 1994 (Amendment 29) in response to the Columbia River Basin Anadromous Fish Habitat Management Policy and Implementation Guide (USDA FS 1991). The Forest modified the 1990 LRMP Standard 5 for Fish and Wildlife which stated *"provide the necessary habitat to maintain or increase populations of management indicator species with special emphasis on steelhead*" (page IV-63) t*o include specific numeric desired future conditions (DFCs) to protect water quality, features of riparian vegetation, riparian dependent species, and components of fish habitat.* The amended Standard 5 included specific numerical DFCs for Management Area 3A (non-anadromous riparian areas) and Management Area 3B (anadromous riparian areas). The DFCs provided numeric values for the elements and sub-elements of: 1) sediment/substrate, 2) water quality, 3) stream channel morphology, and 4) riparian vegetation.

Amendment 29 states, "*These values are based upon the best information currently available and are considered to be consistent with management area desired future condition. If new information becomes available in the future which indicates changes in the numeric values to achieve the stated desired condition, these values may be inserted as a clarification/correction to the individual standard*."

Amendment 29 did not set specific quantifiable standards for livestock grazing activities. However, grazing activities can directly affect the attainment of Amendment 29 DFCs for: 1) sediment/substrate (cobble embeddedness), 2) water quality (water temperature – Forest wide or by fish species), 3) channel morphology (large woody debris, bank stability, lower bank angle, width to depth ratios, 4) riparian vegetation (ground cover, percentage of stream bank vegetated), and 5) shade/canopy closure (hardwood/meadow complex). DFCs were developed to provide the criteria against which attainment or progress toward attainment of the riparian goals are measured. The MNF was directed to manage according to the more conservative standards applicable to habitat components of anadromous riparian areas as between Amendment 29 DFCs and the Riparian Management Objectives (RMOs) of the PACFISH/INFISH amendment (Table 5). See Section 1.4.3 and 1.4.4 for PACFISH/INFISH details.

Table 5. Identification of the More Stringent Habitat Indicator Objective (Amendment 29 Desired Future Conditions or PACFISH/INFISH Riparian Management Objective)

Habitat Indicator	Desired Future Condition or Riparian Management Objective		More Stringent Condition or Objective
	Amendment 29	PACFISH and INFISH RMOs	
Cobble embeddedness	<20% embedded	NA	Amendment 29
Water temperature	Forest-wide: No increase if < 68°F, reduce to 68°F if >68°F ≤ 55°F Bull Trout spawning and rearing habitat	No measurable increase. Max below 64°F for migration/rearing, max below 60°F for spawning (PAC) No measurable increase. Max below 59F for adults and 48F for spawning and rearing (INFISH)	MCR steelhead: PACFISH RMO CR bull trout: Amendment 29 in part and INFISH RMO in part.
Large Woody Debris Stream Densities (pieces per mile in forested systems)	Varies by ponderosa (20-70/mi) Mixed conifer (80-120/mi) lodgepole (100-350/mi) Sizes vary.	>20/mi >12" dia >35' length	Amendment 29
Pool frequency (wetted width in feet/Number of pools per mile	Range expected for Rosgen (1996) B&C streams, upper limits adjusted for streams >75 ft. to be consistent w/PACFISH. Provides table w/ranges by bankfull width (BFW)	Table provided shows pools/mile by wetted width. All values fall within ranges by BFW of Amendment 29	Same
Bank stability	90% and no decrease if above 90% (forested streams)	>80% (non-forested streams)	Amendment 29
Lower bank angle (undercut banks) non-forested	50-75% of banks w/90 degree angle or greater	>75% w/90 degree angle	PACFISH RMO
W/D ratio	<10	<10	Same
Potential LWD forest	To provide a rate of input to maintain large woody material standard	NA	Amendment 29
Ground cover	90% of site potential	NA	Amendment 29
% streambank vegetated	90% of site potential	NA	Amendment 29
Percent shade/canopy closure	Varies by conifer species forest. Hardwood/meadow complex 80% shaded	NA	Amendment 29 Ponderosa Pine 20-50% Mixed Conifer 50-65% Lodgepole Pine 60-75% Hardwood/Meadow 80%

1.4.3 PACFISH LRMP Amendment

PACFISH applies specifically to the MNF lands within the range of anadromous fish including the Beech Creek On-Off Allotment. PACFISH amended Forest LRMPs in 1995 (USDA FS and USDI BLM 1995). PACFISH contains the following components that provide the necessary direction and objectives, and regulatory certainty that FS management actions will be designed to maintain and restore ecological processes that support high quality habitat for anadromous fish, over the long term:

- Riparian Goals;
- Riparian Management Objectives (RMOs);

- Delineation of streamside areas (Riparian Habitat Conservation Areas) that are important to maintenance of high quality aquatic habitat and where special management considerations are applied;
- Standards and/or guidelines to ensure projects do not prevent or retard attainment of riparian goals and management objectives;
- Designation of Key watersheds where habitat for anadromous fish would receive special attention and treatment, and also a landscape pattern of protection would be achieved;
- Watershed analyses to provide a basis for evaluating cumulative watershed effects, define watershed restoration needs, goals, and objectives, implement watershed restoration strategies, and monitor the effectiveness of watershed protection measures;
- Targeted watershed restoration identified through watershed analysis;
- A monitoring program to evaluate the implementation (compliance) and effectiveness of PACFISH in improving aquatic habitat on federal lands.

Riparian Goals provide management context for proposed activities. The goals of PACFISH establish an expectation of the characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats. They are stated in relatively broad, generic terms such that they can be said to apply to most riparian areas regardless of stream type and other more site-specific conditions, but need to be evaluated in the context of the particular stream at issue. Since the quality of water and fish habitat in aquatic systems is inseparably related to the integrity of upland and riparian areas within watersheds, PACFISH articulates the following goals to maintain or restore:

- Water quality, to a degree that provides for a stable and productive riparian and aquatic ecosystem;
- Stream channel integrity, channel processes and sediment regime (including the elements of timing, volume, and character of sediment input and transport) under which riparian and aquatic ecosystems developed;
- Instream flows to support healthy riparian and aquatic habitats, stable and functioning channels, and the ability to route flood flows;
- Natural timing and variability of water tables in meadows and wetlands;
- Diversity and productivity of native and desirable non-native plant communities in riparian zones;
- Riparian vegetation to provide for 1) an amount and distribution of large woody debris characteristic of natural aquatic and riparian ecosystems, 2) adequate summer and winter thermal regulation within the riparian and aquatic zone, and 3) rates of surface erosion, bank erosion, and channel migration characteristics of those under which the communities developed;
- Riparian and aquatic habitats necessary to foster unique genetic fish stock that evolved within the specific geo-climatic region; and,
- Habitat to support populations of well-distributed native and non-native plant, vertebrate and invertebrate populations that contributes to the viability of riparian-dependent communities.

1.4.4 PACFISH/INFISH Riparian Management Objectives

Interim quantitative RMOs for stream channel, riparian and watershed conditions were developed in 1995 to provide criteria against which attainment or progress of the PACFISH and INFISH strategies' riparian goals could be measured. They were first established for PACFISH from stream survey inventory data and used as a description of good anadromous fish habitat (USDA FS and USDI BLM 1995). INFISH (USDA FS 1995a) also

adopted RMO's for inland native fish species, which were identical, except for temperature and Large Woody Debris (LWD) objectives. These objectives are to be evaluated and assessed temporally to reflect the ecological capabilities of specific ecosystems. The attainment of or progress toward some of the objectives is only able to occur over extended periods of time.

The Forest is to manage livestock grazing so as not to prevent or retard attainment of the RMOs (GM-1). The standards and guidelines in the next section are to be used in combination with Forest Plan standards and guidelines (listed above). The intent is that management, including grazing, would not retard the attainment of the RMO's.

- **Pool Frequency:** varies by channel width (see page C-6 in the PACFISH EA/FONSI and page A-4 in the INFISH EA/FONSI)

- **Water Temperature:** No measurable increase in maximum temperature; Meet state water quality standards. The standard is defined as: All streams identified as having anadromous fish passage and salmonid rearing use for Designated Beneficial Use purposes. 7 Day Mean Max 64°F (17.8°C) (migration and rearing habitat); 7 Day Mean Max 60°F (15.6°C) (spawning habitat).

- **Large Woody Debris** (in forested systems): >20 pieces/mile; >12 inch diameter; 35 foot length.

- **Bank Stability:** at least 80%

- **Lower Bank Angle:** >75% of banks with <90 degree angle (i.e. undercut).

- **Width-to-Depth Ratio (W:D):** W:D <10, mean wetted width divided by mean depth (NMFS PACFISH BO 1998); or Bankfull Width-to-Depth Ratio within 75th percentile of the range for minimally managed or reference watershed conditions (i.e. healthy streams) by stream type (analysis pending from PACFISH/INFISH biological opinions (PIBO) Effectiveness Monitoring Team).

The goal is to achieve a high level of habitat diversity and complexity which would meet the life history requirements of the anadromous fish community within a watershed (USDA Forest Service and USDI BLM 1995 Appendix E, p. C-5).

1.4.5 PACFISH/INFISH Riparian Habitat Conservation Areas and Standards

Project- and site-specific standards apply to all Riparian Habitat Conservation Areas (RHCAs) and to projects and activities in areas outside RHCAs that would degrade them. Standards and/or guidelines were developed to ensure to the extent practicable given site conditions that projects do not prevent or retard attainment of riparian goals. Management objectives are to sustain recovery at a near natural rate. PACFISH (USDA FS and USDI BLM 1995) and INFISH (USDA FS 1995a) standards for livestock management are presented below.

> **GM-1.** Modify grazing practices (e.g., accessibility of riparian area to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous fish (PACFISH/inland native fish (INFISH).

GM-2. Locate new livestock handling and/or management facilities outside of Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat Conservation Areas, assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish (PACFISH)/native inland fish (INFISH). Relocate or close facilities where these objectives cannot be met.

GM-3. Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish (PACFISH)/inland native fish (INFISH)

Note that the word "listed" does not accompany the term "inland native fish" in INFISH, as opposed to PACIFISH, which specifies "listed" anadromous fish in the GM standards. Implementing these standards clearly provides a conservation benefit to Mid-Columbia River Steelhead and its designated CH.

1.4.6 PACFISH/INFISH Key Watersheds, Watershed Analysis, and Targeted Restoration through Watershed Analysis

These components of PACFISH/INFISH that amended the MNF LRMP in 1995 are being implemented to the present, but the methods or terms identified with the components have been slightly modified or adapted through the past 20 years to national and regional Forest Service policies, direction, and current science.

The intent of designating Key Watersheds is to provide a pattern of protection across the landscape where habitat for anadromous fish would receive special attention and treatment. Priority within these watersheds would be to protect, or restore habitat for listed stocks, stocks of special interest or concern, or salmonid assemblages of critical value for productivity or biodiversity. Criteria considered to designate Key Watersheds are:

- Watersheds with stocks listed pursuant to the ESA, or stocks identified in the 1991 American Fisheries Society report (AFS 1991) as "at risk" or subsequent scientific stock status reviews; or
- Watersheds that contain excellent habitat for mixed salmonid assemblages; or,
- Degraded watersheds with a high restoration potential.

In addition to key watersheds, which were identified following PACFISH and INFISH, there are also "high priority river basins", "focus watersheds", and "priority watersheds".

High priority river basins originated from Forest Service Pacific NW Regional direction and are six-digit HUC watersheds. Within the high priority river basins (which is the John Day River on the MNF), each National Forest identified three "focus watersheds" at the ten-digit HUC. The Malheur NF's initial focus watersheds were Bridge Creek Middle Fork John Day; Camp Creek Middle Fork John Day; and Canyon Creek. Priority Watersheds have been identified as part of the Watershed Condition Framework (WCF) which is a national policy for the Forest Service (USDA 2011) that directed each National Forest to rate the condition of their 12-digit HUC sub-watersheds based on a model consistent across the agency. Each National Forest has identified a subset of "priority watersheds" from their WCF work to help target focused restoration, and produced "Watershed Restoration Action Plans" (WRAPs) for those priority watersheds. The Malheur National Forest's priority watershed is Camp Creek. The regional system of high priority river basins and focus watersheds were initially identified as part of the regional Aquatic Restoration Conservation Strategy prior to the WCF rating and 12-digit HUC priority watershed designation.

The MNF has about 57% of the Forest covered by Watershed Analyses conducted between 1995 and 2002 (Table 6). This type of focused analysis has not been conducted since 2004. Some of the same components and considerations are evaluated and analyzed during "landscape scale analysis for accelerated restoration" on the Malheur NF, however not all the key questions, analysis and synthesis that was provided by Watershed Analysis occurs during landscape analysis.

Table 6. Watershed Analyses Conducted by the Malheur National Forest.

Forest	NHD HUC10	NHD HUC Name	Assessment Name	Year
Malheur (17/17)	1705011601	Headwaters Malheur River	Malheur Headwaters	2000
	1705011602	Wolf Creek	Wolf Cr. (L. Malheur)	1996
	1705011603	Pine Creek	Pine Creek (L. Malheur)	1996
	1705011605	Griffin Creek-Upper Malheur River	Muddy Creek (L. Malheur)	1996
	1705011611	Upper North Fork Malheur River	Upper North Fork Malheur	1995
	1707020101	Upper South Fork John Day River	Upper South Fork John Day River	1995
	1707020102	Middle South Fork John Day River	Deer Creek	2000
	1707020103	Murderers Creek	Murderers Creek	1997
	1707020106	Grub Creek-John Day River	Prairie City/Strawberry	1997
	1707020107	Canyon Creek	Canyon Creek	2004
	1707020301	Bridge Creek-Middle Fork John Day River	Upper Middle Fork John Day	1998
	1707020302	Camp Creek -Middle Fork John Day River	Galena	2002
	1712000203	Upper Silvies River	Upper Silvies	2000
	1712000204	Middle Silvies River	Silvies Canyon	2000
	1712000205	Emigrant Creek	Emigrant	1997
	1712000401	Claw Creek	Wickiup	1998
	1712000402	Upper Silver Creek	Silver Creek	1998

Targeted watershed restoration is an outcome of the various priority, key, and focus watersheds, as well as occurs during landscape scale vegetation NEPA analyses on the MNF. The landscape NEPA analyses include watershed condition issues and proposed actions to restore areas or conditions that have been identified during the landscape NEPA analysis, including range improvements in some cases. In addition, the WRAPs for priority watersheds are an excellent example of targeted restoration. While Watershed Analysis also allowed for the identification of targeted watershed restoration, it was not as explicit in helping a National Forest prioritize where the most beneficial and highest priority work should occur across a National Forest.

1.4.7 PACFISH Enclosure B: Livestock Grazing Guidelines

A revision of PACFISH Enclosure B, the "Recommended Livestock Grazing Guidelines," was sent to the PACFISH Forest Supervisors on August 14, 1995 (USDA FS 1995b). The guidelines were recommended for use in modifying applicable allotment management plans, annual operating plans, project decision documents and instructions to permittees to provide a high degree of assurance that objectives for conservation and restoration of anadromous and inland fish habitat would be met. Enclosure B is repeated here verbatim from the 1995 document.

The revision identified a set of key assumptions. One of the assumptions is that the goals or desired outcomes of management efforts provide the foundation for the recommended programmatic livestock grazing guidelines. The PACFISH EA was described as providing suitable riparian goals. All management activities should be structured so as not to prevent or meaningfully hinder accomplishment of the goals.

A summary of key Assumptions identified in the Enclosure B revision are:

- Influences of livestock grazing must result in riparian restoration at a minimum of "near natural" rates. We recognize that some environmental effects are inherent with the presence of livestock. However, we believe that "near natural" rates of recovery can be provided if we limit environmental effects to those that do not carry through to the next year**,** thereby avoiding cumulative, negative effects.

Adverse effect to aquatic habitat associated with livestock grazing can be avoided, and riparian restoration provided by controlling:

- Season of use (tied to plant phenology and soil characteristics rather than calendar dates); and amount of use.
- Providing for the health, form and function of riparian systems should remain the focus of management efforts.
- Stream gradient, inherent stability characteristics, potential vegetative communities, and type of degradation (i.e., vegetation vs. bank/channel characteristics) are important factors in determining restoration potential and guidelines that will lead to restoration.
- Guidelines for developing allotment specific prescriptions can be identified at the programmatic level. However, in general, the prescriptions themselves must be developed to fit "on-the-ground" conditions within the context of those guidelines.
- In some definable cases, avoiding adverse effects can only be accomplished by suspending livestock grazing. These cases include problems related to ecological status.
- Effective monitoring using specific measurement approaches, as well as administration, are essential.
- Maintain or allow for improvement of conditions where criteria for late-seral ecological status are met or exceeded.

PROGRAMMATIC GUIDELINES FOR LIVESTOCK GRAZING

As noted in the assumptions above, the goals, or desired outcomes of management efforts provide the foundation for the recommended programmatic livestock grazing guidelines. The guidelines and resulting site specific prescriptions are of value only to the extent they contribute to meeting these goals. The Environmental Assessment for PACFISH interim direction provides suitable riparian goals for the land management agencies (See PACFISH EA, Appendix E, pages C-3 and C-4). All management activities implemented, including non-livestock related activities, should contribute to accomplishment of these goals.

Where these goals are met, the following on-the-ground attributes will be evident (See BLM Technical Reference 1737-9, Process for Assessing Proper Functioning Condition):

(1) Floodplains are inundated by relatively frequent events (i.e., 1-3 years).

(2) Stream sinuosity, width/depth ratio, and pool frequency reflect the capabilities of the setting (i.e., landform, geology, and bioclimatic region).

(3) Lateral stream movement is associated with natural sinuosity (i.e., streambank stability reflects the inherent capabilities of the setting).

(4) The overall system is vertically stable.

(5)Streambank morphology reflects the inherent capabilities of the ecological setting.

(6) Upland watershed conditions within the allotment are not contributing to degradation of riparian habitat conservation areas.

(7) Riparian vegetation characteristics:

- diverse age structure for woody species (where such species are a part of the natural system);
- plants exhibit high vigor;
- species present indicate maintenance of riparian soil moisture;
- streambank vegetation protects stream banks and dissipates energy during high flows (i.e., consider community type composition, rooting characteristics, and plant density); and
- provide an adequate source of coarse and/or large woody debris (where such debris is a part of the natural system).

MANAGEMENT CONSIDERATIONS

Based on the key assumptions previously outlined in Enclosure B above, the following guidelines are recommended for use in modifying applicable allotment management plans/annual operating plans/project decision documents/instructions to permitees to provide a high degree of assurance that objectives for conservation and restoration of anadromous fish habitat will be met.

These recommendations do not specifically address "priorities" for taking action. Taking action to conserve Columbia River Anadromous Fish is not optional. However, we believe priorities can be identified where there are insufficient resources to "do it all." Those priorities are as follows:

1. Maintain or improve conditions, where the criteria for "late seral" ecological status are met or exceeded (i.e., it is easier to protect healthy riparian systems than restore degraded ones). See Key Definition-Ecological Status.
2. Adjust management practices, where the criteria for "mid-seral" ecological status are met but the trend is static or downward. This is especially important, where vegetative factors are primarily responsible for the mid-seral rating (i.e., making adjustments at this stage is likely to prevent stream bank/channel damage of a lasting nature).
3. Adjustments in management practices, where the criteria for "early seral" ecological status are met, and primarily tied to deteriorated stream bank/channel conditions (especially in cases of severe channel downcutting where channel evolution has not re-created a floodplain), may contribute little to the recovery of the system in the near term.

RECOMMENDATIONS INCLUDED IN ENCLOSURE B

- Continue current grazing prescriptions in pastures/allotments where ecological status is "late seral" (or better) based on either riparian vegetation or stream bank/channel conditions. Ensure residual herbaceous vegetation heights of at least 4 to 6 inches, and that no "condition thresholds" are exceeded. (See Key Definitions - Ecological Status and Residual Herbaceous Vegetation Heights)
- Where ecological status is "mid-seral," limit grazing in pastures/allotments to provide at least 6 inches of residual herbaceous vegetation and to ensure that no "condition thresholds" are exceeded. For moderate and low gradient (i.e., Rosgen "B" and "C" channel types) channels, with substrates

composed of medium to fine easily eroded materials, also limit use to early season grazing to provide for recovery of stream bank/channel characteristics. (See Key Definitions - Early Season Grazing)

- In pastures/allotments where ecological status is "early seral", the following is strongly recommended:
    - In moderate and low gradient (i.e., Rosgen "B" and "C" channel types) channels, with substrates composed of medium to fine easily eroded materials, consider rest.
    - In all moderate to high gradient stream systems (Rosgen "A" and "B" type channels) with coarse substrate materials that provide inherent stability, whose ecological status rating of early seral is tied entirely to vegetation characteristics, grazing may be permitted if limited to early season use, residual herbaceous vegetation heights of at least 6 inches are met, and no "condition thresholds" are exceeded.
- Where early season grazing, as prescribed above, would result in adverse affects or is impractical, mid- or late-season grazing may be alternatives. However, residual herbaceous vegetation requirements would still have to be met and no "condition thresholds" could be exceeded.
- Appropriate "condition thresholds" will be monitored in all pastures/allotments. Results are to be reported on an annual basis, and appropriate adjustments made to the annual operating plans.

KEY DEFINITIONS (The following definitions from Enclosure B are applicable to this consultation except as noted)

Condition Thresholds: A number of indicators of impending impacts that would carry over to the next year would be monitored during the period of use and act as "triggers" to prevent damage. These should not be exceeded anytime during the grazing season. The recommended triggers and associated threshold values are as indicated below:

New bank alteration (the bank alteration threshold incorporated into the Proposed Action is different than Enclosure B due to more recent research and the development of new protocols for measuring bank alteration): bank instability that becomes evident after livestock grazing is initiated in a pasture/allotment in a given year. This assumes that early season use occurred following peak flows, when most of the additional bank damage can be tied to land use activities. The recommended threshold is 5% of the lineal bank distance (includes both sides of the stream).

Riparian area alteration: two measures of riparian area alteration are proposed. Each keys on areas away from stream banks that are good early indicators of impending riparian damage.

- The first relates to use of "riparian islands" - those portions of riparian areas slightly higher and drier than the rest of the riparian area. These are often dominated by Kentucky bluegrass. The recommended threshold is 25% of the areas with visible trampled soils or a vegetation height of 2 inches, which ever is reached first.
- The second measure relates to livestock use of "riparian sinks" - those portions of riparian areas slightly lower and more moist than the rest of the riparian area. These are often dominated by carex species. The recommended threshold is utilization in excess of a vegetation height of 3 inches.

- Riparian "island" and "sinks" are not significant components of all riparian areas. Generally only one of these features would be used as an indicator of impending riparian damage (i.e., the one that represents a significant component of the riparian area away from the stream side and/or which first shows signs of damage).

Woody vegetation utilization (the woody browse threshold incorporated into the Proposed Action is not consistent with Enclosure B): proposed limitations on season and amount of use, suggest that woody vegetation utilization would seldom be of concern. Monitoring of this feature would generally be limited to those circumstances where the prescription calls for mid- or late-season grazing or where there is a documented problem with woody vegetation utilization. The recommended threshold is 30% of the current year's growth, measured as incidence of use.

Ecological Status: Al Winward, in Clary and Webster (1989), defined "ecological status" as a measure of the degree of similarity between current vegetation and potential vegetation for a given riparian area. Our definition of "ecological status" adds to Winward's definition, recognizing the importance of stream bank and channel features. Definitions follow for each of the categories:

In those areas where livestock are a significant factor in the streambank rating, use both or either the vegetative factor and the streambank factor in determining the seral stage.

- **Early Seral**
  Percent similarity of riparian vegetation to the potential natural community/composition ≤ 25%; or, Stream bank/channel condition rating "poor".
- **Mid-Seral**
  Percent similarity of riparian vegetation to the potential natural community/composition 26-50% or better; and, Stream bank/channel condition rating of at least "fair".
- **Late Seral**
  Percent similarity of riparian vegetation to the potential natural community/composition ≥ 50%; and, stream bank/channel condition rating "good" or better.

If similarity of riparian vegetation information is lacking or cannot be readily obtained, use BLM Technical Reference 1737-9, Process for Assessing Proper Functioning Condition, or other rating systems. In using the previously mentioned technical reference, the following approximate crosswalk may be applied to relate functioning condition and ecological status:

- Proper Functioning Condition - continue current management if monitoring data supports or use recommendations for late seral.
- Functional-At Risk, upward trend - continue current management if monitoring data supports or use recommendations for mid-seral.
- Functional-At Risk, static trend - use recommendations for mid-seral or early seral depending on site specific conditions.
- Functional-At Risk, downward trend; or,
- Non-Functional, use recommendations for early seral.

Greenline: That specific area on or near the waters edge where a more or less continuous cover of perennial vegetation is encountered. Natural plant species forming the greenline are composed primarily of large, hydric species such as beaked sedge, Nebraska sedge, bluejoint reedgrass, or other especially strong rooted species capable of buffering the forces of water at the bankfull discharge level. Disturbance activities, such as overgrazing or trampling by animals or people, result in changes to shallow rooted species such as Kentucky bluegrass, which have a reduced ability to buffer water forces.

Early Season Grazing: Early season grazing is defined in terms of the phenology of the vegetation. Early season grazing is limited to that period where upland vegetation is green but not drying. It typically begins

about the second to third leaf stage and ends between boot and flowering of perennial upland bunch grasses. Caution should be used to avoid soil compaction and bank alteration from physical damage that can occur in some settings with early season grazing.

In general early season, or spring season encompasses the period from the end of supplemental feeding for livestock to seed ripe and includes the time during which soil moisture levels are at their highest due to snow melt and spring rain. Time frame: Early May to early/mid-July (added to update this BA)

Late Season Grazing: Late season grazing generally begins after sugar storage in woody vegetation is complete and leaf fall has started. Upland plant seeds have shattered and mean air temperatures begin to cool. Time frame: mid/late September to December (*added to update this BA*).

Mid-season Grazing includes the hotter part of the summer during which upland forage has dried, seed ripening has occurred, and soil moisture content in the riparian areas have declined. Time Frame: early/mid-July to mid/late September (*added to update this BA*).

Near Natural Rate of Recovery: Synonymous with PACFISH requirement not to "retard" or "measurably slow" recovery of degraded riparian features. Further defined in these recommendations within the context of effects that "carry over to the next year." Any effect that carries over to the next year is likely to result in cumulative negative effects, and measurably slow recovery of degraded riparian features.

Residual Herbaceous Vegetation Height: Residual herbaceous vegetation height, measured at the end of the growing or grazing season (which ever occurs latest), is used as an indicator of a system's ability to withstand erosive stream flows, filter sediment and build stream banks. Residual herbaceous vegetation height measurements are to be taken on those hydric species along the greenline with the capability to buffer water forces (See above discussion of "greenline").(For the purposes of implementation monitoring of the end point indicators, the MNF proposed to measure within one to two weeks of cessation of grazing.)

Exclosure: An area fenced to keep animals out (Society of Range Management 1974).

Trailing: Controlled directional movement of livestock (Society of Range Management 1974).

2 MONITORING

The history of range, stream, riparian, and watershed condition monitoring has evolved through time in both the Pacific NW Region of the Forest Service and on the MNF since Columbia River bull trout and MCR steelhead were listed under the ESA in 1998 and 1999 respectively. Prior to the listings, range monitoring of uplands was a primary focus, although sporadically documented or established in time and place from the 1920's to the 1980's. The primary method used for range monitoring was utilization with height-weight curves. In 1998 National Forests under the PACFISH/INFISH decision began to use stubble height to monitor herbaceous vegetation use. A 4-6 inch stubble height (4 inch early season use, 6 inch late season use) on key riparian grasses was used to closely approximate the 1990 Forest Plan standard of 35 percent and 45 percent utilization. Some monitoring photo points did document changes in stream and riparian conditions from the 1930's to the 1980's (MNF 2003, Appendix F). In recent times (since listing and ensuing litigation over grazing on the MNF from the early 2000's to the present) continuity and documentation of monitoring has improved, although methods have varied during that time, primarily due to changes in funding and personnel.

The monitoring programs discussed in Appendix C were used to describe the environmental baseline in Section 4 of this BA. Four of these programs, PACFISH/INFISH Biological Opinion monitoring (PIBO), Multiple Indicator Monitoring (MIM), Level II stream surveys, and steelhead spawning surveys are incorporated into the Proposed Action as described in Section 6.1. Properly Functioning Condition Assessments and channel cross-sections, are not incorporated into the Proposed Action, but may provide additional information regarding the effects of the grazing program over time.

2.1 PACFISH/INFISH (PIBO) MONITORING

When salmon, steelhead, and bull trout were listed under the Endangered Species Act in the Columbia River basin, the National Forests in the basin amended their forest plans with the "PACFISH/INFISH" environmental assessment (EA). In 1995 a Biological Opinion was established for the PACFISH and INFISH EA called the "PIBO" (PACFISH INFISH Biological Opinion USDA NMFS 1998). The monitoring program established for PIBO is intended to evaluate the effectiveness of the amended forest plans that included new or revised standards and guidelines for grazing management. The monitoring is intended to evaluate whether the structure and function of riparian and aquatic systems on lands managed by the BLM and USFS is being maintained or restored.

The objectives of the PIBO Effectiveness Monitoring (EM) program are to:

1. Determine whether a suite of biological and physical attributes, processes, and functions of upland, riparian, and aquatic systems are being degraded, maintained, or restored across the PIBO landscape.

2. Determine the status and trend of change in riparian and aquatic habitats over time as a function of management practices.

3. Determine if specific Designated Monitoring Area (DMA) practices related to livestock grazing are maintaining or restoring riparian vegetation structure and function.

Information on stream habitat features documented in this section includes:

Site type – I is for "Integrator" sites that have been established to evaluate the response of streams to all upstream management activities. They are generally located in low-gradient response reaches as far downstream in a subwatershed on federal land as possible and are sampled once every five-years. In some

areas of the Blue Mountains, but not on the MNF, there are "reference" I sites (no permitted grazing within the last 30 years, less than 10% of the watershed undergoing timber harvest, no evidence of mining near riparian areas, and road densities less than 0.5 km/square km). Reference sites allow for comparisons of habitat variables to managed sites. There are 19 reference sites in the Blue Mountain Ecoregion that are used for MNF comparisons.

Site type - K is for "key" sites, which are also called DMA sites that were to be specifically selected with input from district range management specialists in subwatersheds with integrator stream reaches to assess the impacts of livestock on riparian vegetation and stream habitat. DMA sites are evaluated during and after the grazing season every five-years to determine if the pasture was used in compliance with the allotment management plan, and if end-of-season grazing implementation standards have been achieved.

Total Index – The status of integrator reaches is determined through a "habitat index score approach" to compare habitat variables at managed sites to reference sites in the local area (Blue Mountains ecoregion) and to all reference sites in the PIBO study area (the interior Columbia River Basin). The total index is determined on a scale from 0 to 100, with a higher number indicating similarity to reference site values and a lower number indicating the site is less similar to reference site values.

Bankful width:depth (W/D) – High width to depth ratios indicate an overly shallow stream with a wide wetted area. Increases in solar gain (temperature increases) and decreases in quality pool habitat are indicative of wide shallow streams. Different stream types (e.g. higher (and steeper) in a watershed vs. meandering meadow streams have a range of natural width:depth ratios. Healthy meadow systems should be deep and narrow and have a low width:depth number.

Mean particle size (D50) in millimeters (mm) – D50 is the median particle size of the streambed substrate. Smaller D50's can be an indication of excess fine sediment in a stream system. Particles are measured in both pools and riffles. Median particle size is also measured and has similar attributes.

Percent pool (% pool) – The presence of pool habitat is highly important for trout, steelhead, and salmon. Streams that have been widened through historical impacts from logging and grazing, along with removal of instream large wood, tend to have less pool habitat than levels in reference streams of similar character.

Residual pool depth (meters) – This is a measure of pool depth at low levels of streamflow and is calculated by subtracting maximum pool depth from the depth at pool tail crest (e.g. if you stopped water from entering an overflowing bathtub with a notch at one end, at which point the tub would quit flowing over, how deep is that compared to the deepest measurement of the bathtub - not at the notch – that is the concept of "depth at pool tail crest"). Residual pool depth is an indication of the quality of pool habitat, and sometimes indicates that a pool has filled with fine sediment. The higher the residual depth the higher the pool quality.

Percent fines less than two millimeters (<2mm) and less than six millimeters (<6mm) – This is a measure of the percent of fine material within the tails of pools (areas where trout and salmon spawn and lay eggs). Excess fine material smothers eggs. The higher the number the greater amount of fine material in the streambed in the tail area of pools.

Bank stability (percent) – Stream systems have a small amount of naturally unstable banks, however low bank stability indicates a system that has been recently disturbed and/or is not in equilibrium with the overall functioning of the stream and its watershed. Specific to PIBO stable banks are the percentage of 40+ plots (30 cm. wide) that show no evidence of fractures, slumping, or cracks.

Vegetative Bank stability (percent) – Specific to PIBO vegetatively stable banks are the percentage of 40+ plots (30 cm. wide) that show no evidence of fractures, slumping, or cracks, and that are also covered with >50% perennial vegetation, roots, rocks >15 cm. in diameter or logs >10 cm. in diameter or a combination of those. Stream systems have a small amount of naturally unstable banks, however low bank stability indicates a system that has been recently disturbed and/or is not in equilibrium with the overall functioning of the stream and its watershed.

Bank angle (degree) – The objective of documenting the bank angle is to determine the frequency of undercut banks in the stream reach. Legacy and ongoing management of streamsides from logging, roads/trails, and grazing have caused a loss of undercut banks on stream systems on the Malheur National Forest.

Bank undercut (percent) – Undercut banks provide cover for fish, refuge, streamside shade, and pockets of cooler water in the summer months, and pockets of thermal refuge in the winter.

Greenline Wetland Rating – One equals upland, 25=facultative upland, 50=facultative, 75=facultative wetland, 100=obligate wetland –A low score indicates that upland plant species occupy the interface between the water and the riparian vegetative community, and higher scores indicate a stream connected to wetland plant species that depend on and are receiving an abundance of water (e.g. connection to groundwater or periodic seasonal flooding). Historical grazing has modified many systems from obligate streamside wetland species to upland species such as Kentucky bluegrass. Higher scores indicate a streamside less modified by management impacts.

Greenline Woody Cover (GL woody CV) – This is the sum of the relative cover of woody species out of 200% due to shrub canopy, and is an estimate of the percent of cover provided by woody vegetation adjacent to a stream.

Aquatic Macroinvertebrates – Sampling the macroinvertebrate community provides information regarding habitat condition, productivity, and water quality. PIBO provides data for: 1) richness (total number of unique taxa); 2) community tolerance quotient (an index widely used by the USFS and BLM to compare the aquatic macroinvertebrate community to high quality vs. polluted waters); 3) intolerance (number of intolerant taxa at a site intolerant to poor quality water); and 4) RIVPAC (Hargett et. al. 2007) score (a predictive model that compares expected versus observed number of taxa based on number of taxa in high quality water).

2.2 MALHEUR NATIONAL FOREST RIPARIAN MONITORING STRATEGY

The MNF Riparian Monitoring Strategy was a forest policy developed in 2006. At that time in order to deal with the many accepted methodologies and analytical tools available to monitor short-term and long-term rangeland and forest health, the MNF documented an overall strategy, methods, and those tools to be used for determining condition and trend of riparian ecosystems as they related to grazing activities. The methods and tools chosen were dependent on the specific monitoring objectives as well as constraints such as timing, available funding and personnel, other priorities, and the geographical area to be monitored. Currently, the assessments and monitoring methods used are still intended to be an important part of the adaptive management process and are subject to changes or modifications based on new scientific findings and improvements in methodologies as well as changes in definitions and policy. Moreover, risk analyses and prioritization were to be considered in all areas prior to initiating monitoring in order to determine the level and intensity of

quantitative data collection. All of these tools were, and are still intended to help provide the MNF information for many of the RMOs.

Below are the key components of the MNF Riparian Monitoring Strategy that are incorporated into the proposed action. Multiple Indicator Monitoring and spawning surveys are incorporated into the Proposed Action. Proper Functioning Condition assessments, channel cross-sections and Forest Service stream surveys are not specifically incorporated into the Proposed Action but may occur in the Action Area providing additional information regarding the status of CH over time:

1. Information Gathering and Interpretation

- Proper Functioning Condition (PFC) Assessment –qualitative condition assessment over a stream reach (geomorphic or unit-specific), used to spotlight focus areas for monitoring. Proper functioning condition assessments can serve as the risk analyses/prioritization step. PFC can provide a coarse filter to determine where to conduct more intensive quantitative monitoring, such as MIM or PIBO.
- Multiple Indicator Monitoring (MIM) – quantitative monitoring protocol at MIM Designated Monitoring Areas (DMAs). Stubble height, streambank alteration, and woody browse is to be monitored at the end of grazing use within 1 week from the removal of livestock, to identify current year management issues in all pastures with critical habitat. The timing of the 1 week visit has been considered by the MNF to include a second week in order to meet staffing needs to monitor multiple sites (e.g. monitoring within one week of scheduled end of grazing use by livestock, but no longer than two weeks after cattle have left the pasture). The MNF has previously interpreted the MIM intent to monitor as consistently allowing for monitoring at the end of the growing season, which is used in MIM to monitor "residual vegetation remaining to protect streambanks during high winter or spring flows" vs. the typical collection of short term data for annual indicator status immediately following livestock use. The full 10 indicator MIM, versus the three indicator MIM discussed immediately above, is to be completed at years 3 and 5 intervals prior to livestock turnout in the spring or early summer, to identify long term trends.
- Channel cross-section, streambed particle size distribution, and reach description measurements (i.e. Rosgen Channel Type).
- Forest Service Region 6 Level II Stream Inventory Surveys – extensive quantitative assessment of stream channel and aquatic habitat condition, with limited information on aquatic species present at the time of the survey, to determine condition of selected stream systems. Survey attributes collected are typically: flow, elevation, Rosgen channel type, valley type, flow regime, stream order, average width, width-to-depth, unstable banks, pool frequency and depth, large woody material per mile, substrate (%), riparian vegetation, and large wood recruits.
- Spawning Surveys – Quantitative assessment to identify presence of spawning activity and/or redds; assessment of vulnerability to livestock, design and implementation of protective measures.

2. Support determinations of plan compliance – Provide information on which the Malheur National Forest can assess compliance with the Forest Plan, including PACFISH & INFISH amendments.

- Standards are GM 1-4 in PACFISH & INFISH (GM 1-3 previously stated in section 1.4.5. GM-4 is "Adjust wild horse and burro management to avoid impacts that prevent attainment of Riparian Management Objectives or adversely affect anadromous/inland native fish"); standards 15-22 for Management Areas 3a and 3b in Forest Plan (see Chapter IV of the 1990 LRMP and section 1.4.1 of this BA).

- Management Objectives for stream and riparian areas are described in PACFISH & INFISH amendments (RMO's) (section 1.4.4) and in Amendment 29 (section 1.4.9) of Forest Plan for MA3A/B (DFC's).

3. **Recommendations:** Determine the linkage between condition, trend, and past/current management activities by conducting a process that provides support for grazing management decisions or any necessary or appropriate adaptive management adjustments. Allows annual adjustment of management strategies, as needed, to achieve compliance with plan direction. (End of 2006 Riparian Strategy)

The Malheur National Forest Riparian Monitoring Strategy has not been consistently applied since 2006, for instance the last documented PFC analysis was in 2012, and MIM trend monitoring is not often implemented on the MNF. The primary information gathering to determine short and long-term condition of the streams and watersheds is conducted through MIM monitoring of the three indicators (stubble height, bank alteration, and woody browse) at the end of the active grazing use period, Level II stream surveys to be conducted every 10 years, temperature monitoring (in some locations), photos, and spawning surveys. Updated monitoring components described in this Biological Assessment which are part of the Proposed Action are:

- Document monitoring results for both mid-point trigger (photo or MIM) and end of use (three indicator MIM) monitoring at DMA locations.

- Increase documentation of MIM DMA sites with photos, monument/markers, and spatial data. If one or two indicators cannot be measured at the site, document through an ID team and provide to the Malheur Level 1 representative why a new site has not been established.

- Continue with Level II stream surveys and redd surveys in coordination with Oregon Department of Fish and Wildlife (ODFW) and any appropriate tribes.

- Continue with season long, multi-year temperature monitoring at selected sites in relation to high value fish habitat or proposed restoration.

- Institute methods to determine ecological seral status or departure from desired riparian condition with PIBO and 10 indicator MIM data.

- Conduct 10 indicator MIM trend monitoring to augment sites where PIBO data is not collected (three to six sites per year for the next four years with a three year rotation of re-visits).

2.3 MOST SENSITIVE RIPARIAN AREAS (MSRA) IN RELATION TO ESA-THREATENED MCR STEELHEAD.

In response to previous ESA and National Forest Management Act (NFMA) litigation over range management and prior to the previous consultation of 2012, as part of a court order the MNF identified stream reaches with valuable steelhead spawning habitat and high potential fish production critical habitat (CH) that are typically most accessible and sensitive to livestock use. Because of the life-cycle stages of Mid-Columbia River (MCR) steelhead relevant to streams within Forest livestock allotments, the MNF decided to identify known and likely spawning areas for MCR Steelhead as "Most Sensitive Riparian Areas" (MSRA). The same exercise was expanded to include bull trout on the MNF with an objective to help narrow and focus on stream reaches of concern for livestock interactions. MSRA provides an added layer to focus attention, which assists range staff in management. Designated CH is documented on official maps from USFWS and NMFS, continues to be

managed for recovery objectives, and covers more linear miles than MSRA. MSRAs are characterized by low gradient (4% mapped or less), unconfined, open meadow reaches of a stream. Typically, Rosgen (1996) C and E channel types that are unconfined stream channels with low gradients. Riparian areas adjacent to potential spawning areas can be more sensitive to impacts for ESA listed fishes because they occur on low gradient sections of a stream and often prove to be particularly attractive to grazing livestock as a water and shade source. The presence of MSRA in a pasture requires different grazing management strategies (e.g. reduced bank alteration thresholds and or other actions).

The MSRA mapping exercise was based on the concept of intrinsic potential (IP) modeling that uses geospatial data such as intrinsic topographic and climatic features to rank stream reaches in terms of their potential to provide habitat that can support high or low potential for fish or other species. Intrinsic Potential analyses are used to inform prioritization of sites for restoration or conservation, recovery planning, and the historic distribution of fish (Sheer et. al. 2008). The MNF used stream channel gradient and valley width topographic features as well as the location of Oregon Department of Fish and Wildlife (ODFW) index spawning reaches to identify the MSRAs.

The decision-making process on model validation and determining whether a stream section is a MSRA was intended to be conducted in an interdisciplinary team approach, integrating range, hydrology, and/or fisheries staff. MSRA has also been used to narrow the focus of spawning surveys to best utilize time and resources. While the original intent after 2012 was to allow MSRA to be adjusted, expanded or deleted from the maps if model validation failed to detect the presence of cattle preference of these areas. Unfortunately, MSRA adjustments were not well documented. A review of the original MSRA layers by the Forest Fisheries and Watershed Program Managers, the GIS staff, and discussion on the time it would take to refine these layers based on improved modeling and available data, determined that there would not be an update of MSRA prior to completing this consultation and the original MSRA layer will apply to the current (2023-2027) consultation. Until MSRA is refined, MSRA adjustments will be initiated by District ID Teams, with review and agreement through the interagency streamlining (Level 1) consultation team for the MNF.

3 CONSULTATION COMPLIANCE 2018-2022

Compliance with the Terms and Conditions of the 2018 Biological Opinion is summarized in Sections 3.1-3.5 below.

3.1 COMPLIANCE WITH ENDPOINT INDICATORS 2018-2022

Through annual allotment grazing strategies, allotment operating instructions (AOIs) and/or grazing authorization letters, the MNF had been applying g terms and conditions to pastures during the grazing seasons to address stubble height, woody browse, and streambank alteration exceedance, which was also to trigger implementation of annual adaptive management strategies by the MNF. As part of the MNF long-term adaptive management strategy, streambank alteration exceedances may also trigger evaluation of the term grazing permit. Recurring non-compliance can lead to suspension of AUMs or the cancellation in part or whole of the grazing permit. Permit action involving the suspension or cancelation of the grazing permit would follow direction outlined in FSH 2209.13, 10, 16.2, and 36 CFR 222.4. Under existing Forest Service statutes and regulations, the MNF has full authority to ensure compliance with management expectations as identified in Annual Operating Instructions and other direction for grazing permit compliance. Consistent with this authority, the MNF will continue to hold permittees accountable for compliance with the requirements of their grazing permits and AOIs.

End of use standards were not exceeded during the 2018-2022 consultation period. There were no compliance issues with this allotment over this consultation period.

The updated compliance strategy for the 2023-2027 consultation period in in the "Common to All" (Section 6.1).

3.2 END OF YEAR REPORTING

The monitoring presented in the Year End Grazing Report (EOY) and the compilation of the report for the regulatory agencies is a term and condition from the previous consultation (2018-2022). The reports for the last five years contain use data by allotment and pasture, on/off dates, AUM's, grazing strategies, spawning survey summaries, monitoring information and data from mid-season checks and end of use monitoring. Also required in the report are recommendations for management changes for the next grazing season, descriptions of grazing exceedances, administrative actions, unauthorized use, fence/gate maintenance or condition issues, and any permit compliance issues. The information collected as part of those reports has been utilized in this consultation. Listed fish distribution and spawning survey data were also to be reported.

These reports were submitted to the Services, although we generally did not meet the specified timeframes for report submission.

3.3 REDD SURVEY PROTECTION AND REPORTING

Under Reasonable and Prudent Measures in the 2018 Biological Opinion (which are nondiscretionary measures to minimize the amount of incidental take), the MNF shall:

1. Minimize incidental take caused by livestock grazing along stream resulting in trampling of MCR steelhead redds and disturbing incubating/rearing juveniles by performing spawning surveys and protecting redds.

Under the 2018 Biological Opinion, all critical habitat within each pasture was surveyed or was surveyed to the upper extent of suitable spawning habitat (presence of gravels/cobbles, access). Across the forest, protection has been successfully implemented and documented when redds have been encountered. Across the forest, redd protection primarily consisted of constructing fenced exclosures, or delaying grazing until after July 1. See Section 4.2.3 for specific details on survey results by Allotment and Pasture.

Redd surveys starting in late April and into early June often document a small number (1-3) of steelhead redds in East Fork Beech Creek in the Beef pasture of Beech allotment. Only pastures grazed before July 1 are surveyed for redds. Redd protection is most often in the form of hog panel fencing. By the fourth week in June some of the redds are no longer inundated by the stream. Redd survey results are documented in the End of Year Report, as well permittees are informed and provided maps as part of the consultation requirements for summer steelhead. See Environmental Baseline section for specific spawning survey information in this allotment.

3.4 BEST MANAGEMENT PRACTICES

Watershed Best Management Practices (BMPs) are identified at the National, Regional, and Forest level of the Forest Service as part of demonstrating and achieving compliance with the Clean Water Act (CWA). They also provide methods to address and improve impaired water bodies (303d) listed by the states through their implementation of the CWA. There are three nationally identified BMPs for rangeland management activities (USDA Forest Service 2012): 1) Rangeland Management Planning; 2) Rangeland Permit Administration; and 3) Rangeland Improvements. The various practices identified under each BMP include many actions applicable to reducing impacts and helping recover ESA listed species. Many of them are already incorporated into the MNF's grazing program (e.g. "Adjust livestock numbers, season of use, and distribution when monitoring and periodic assessments indicated consistent noncompliance with permit provisions" and "Establish management requirements such as the season of use, number, kind, class of livestock, and the grazing system").

Across the Malheur National Forest there have been nine Range Management BMP Evaluations completed between 2013-2021. Preliminary results indicate that BMPs were rated as fully or mostly implemented on 44% of the monitoring evaluations. BMPs were marginally implemented, or not implemented on 33% of the sampled sites, and no BMPs were prescribed on 22% of evaluations. BMPs were rated as effective or mostly effective on 33% of evaluations completed across the Forest, and were marginally effective, or not effective on 67%. BMP monitoring is conducted by random sampling across the MNF. As a result of BMP monitoring these range issues have been highlighted:

- A lack of recent Allotment Management Plans
- Fence maintenance that has not been adequately addressed,
- Lenience and lack of consistency in enforcement of non-compliance issues.
- A need to identify long term indicators for stream/riparian desired conditions
- Some examples of corrective actions/adaptive management strategies identified in the BMP evaluations include.
- A day rider is required in the decision document to move the cattle until the riparian exclosures are complete.

- Salting away from water sources to encourage better distribution and lessen impacts to riparian areas (at least 1/4 mile away from water sources and visuals i.e. major roads).
- Improve the rotation of the pastures and ensure proper clean-out of pastures
- Complete recommended exclosures
- Harden water gaps/crossings on critical stream reaches
- Salt blocks need to be rotated around & moved further away from the stream; suggest adjusting to a 2–3-week grazing period
- Consider felling trees into cattle trail to discourage livestock trailing in section that is allowing sediment to enter stream channel
- Recommend reducing time and numbers permitted on allotment. Development of range improvements are also recommended
- There is a need for site specific information/assessment and updated NEPA/AMP for grazing allotment
- Consider adjusting season of use in this pasture from July-August to June-July (pasture did not contain steelhead habitat)
- Potential incorporation of these types of measures can aid in minimizing indirect effects to steelhead and bull trout and designated critical habitat to ensure that agency actions are discountable.

3.5 ECOLOGICAL CONDITION OF RIPARIAN AREAS

The intent in 2018 -2022 was to move forward with identification of current and potential ecological condition of riparian areas. In 2018, with the exception of sites with more than three PIBO data collections (e.g. a site collection every five years over the 15 years since the PIBO program inception), long term trend indicators were lacking on the MNF.

Additional variables from the "full MIM" monitoring were identified in the 2018 consultation as necessary to help identify the ecological baseline condition of riparian areas. That information is important when assessing how departed the riparian condition may be from ecological potential or from a desired condition. The information also further complements and explains the conditions captured by photo monitoring. In the 2018 consultation, part of the proposed action was to conduct the ten indicator MIM effectiveness monitoring at locations not represented by PIBO beginning in the spring of 2018 with three to six full MIMs conducted each year, and revisiting one site beginning in the fourth year (e.g. 2021). The intent was to have a total of 18 to 36 MIM trend sites monitored across the forest between 2018-2022, with sites chosen by the MNF and agreed to as high priority by the Level 1 team. A total of 14 Full MIMs were conducted across the forest from 2018-2021 with some issues over data collection methods in 2020.

The Malheur National Forest also intended to work with the USFS National Stream and Aquatic Ecology Center to develop an ecological classification system of the Forest's stream and riparian areas to provide a framework for improved descriptions of existing vs. desired conditions for a variety of valley types and vegetation communities that comprise the riparian areas on the MNF. This work was to rely on existing information such as the Mid-Montane Wetland Plant Associations of the Malheur, Umatilla, and Wallowa-Whitman National Forests (Crowe and Clausnitzer 1997), and additional information such as stream valley classifications. The goal was to have an improved riparian ecological classification system to assist in resource management, including grazing, by 2019, but no later than 2020. This effort was started but not completed due to changes in personnel.

The Malheur National Forest collected greenline plant composition data on 49 range monitoring DMA's across the forest in 2018 in addition to short-term indicators (key species stubble height, shrub browse and streambank

alterations). This greenline data was not previously collected and in the 2018 Biological Opinion the collection of greenline data was a term and condition. Most monitoring trips (42 of 49; 86%) were conducted after the end of livestock grazing with 7 (14%) conducted on ungrazed (rested) pastures. Only 13 of 49 (26%) site visits were conducted during the growing season before September 1st, when plants are most identifiable.

In 2019 44 DMAs were surveyed using a MIM protocol that assessed only the short-term indicators listed above and for streambank stability/cover. No other long-term indicators were assessed, except at the three full MIM sites (Table 9). Nearly all (38 of 44; 86%) were conducted after the livestock grazing and only 12 of 44 (27%) before September 1st.

In 2020 37 DMAs were surveyed with a MIM protocol that assessed the short-term indicators listed above as well as streambank stability/cover. Greenline plant composition was also assessed. However, it must be noted that the greenline composition data was not collected correctly.

In 2021 a total of 60 post-season MIMs focused on short-term indicators were conducted.

In early summer of 2021, a Forest IDT selected two new DMAs for full MIM along critical habitat within the Upper Camp Creek watershed. Both are within the Long Creek allotment; the first in the Camp Riparian (Charlie) pasture on upper Camp Creek and the second in the Coxie Exclosure pasture on Coxie Creek. These new DMA were sited in two pastures that had not been grazed for many years with the intention that they would serve as reference DMAs for other routinely grazed pastures nearby

Some long-term indicators were not consistently assessed between 2018 and 2021 (woody species height class, woody species age class, greenline-to-greenline width, substrate, and residual pool depth/frequency). To remedy this, in 2022 a permanent technician was hired and assigned to MIM monitoring who can provide consistent oversight.

While long term monitoring efforts have been initiated in many places, the data has not yet been evaluated in a riparian condition assessment. A full evaluation of this data is needed in order to assess riparian condition in the context of the current stream setting against historic disturbances, and current management practices. We anticipate a full analysis of the data to be completed as part of any allotment managing planning and prior to any changes in the "Common to All" section of the Proposed Action in future consultations.

4 ENVIRONMENTAL BASELINE

The Environmental Baseline includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in progress. An environmental baseline that does not meet the biological requirements of a listed species may increase the likelihood that adverse effects of the proposed action will result in jeopardy to a listed species or in destruction or adverse modification of a designated critical habitat.

4.1 GENERAL HISTORY

Prior to Euro-American settlement in the lower elevation valleys, the native forest was predominantly ponderosa pine (Pinus ponderosa) with a fire regime of low-severity fires and 10 to 35 year recurrence intervals (Agee 1993, McIver and Ottmar 2006). As a result of fire suppression, grand fir and Douglas-fir trees are become more common in this action area. Also, because of fuel build up along the forest floor and past logging practices, the fire regime has been altered from one of frequent low-severity fire to infrequent high-severity fires (McIver and Ottmar 2006).

Beaver trappers were some of the first non-native people to explore the action area. Significant reductions in beaver populations led to reductions in beaver dam roughness and likely resulted in channel incision.

Homesteading occurred within the project planning area beginning in the 1880s. Riparian areas within wide valley bottoms on East Fork (EF) Beech Creek were the first to be cleared and flattened for pastureland. Bridges, barns, outbuildings, and homes were built from the immediate forest surrounding the homesteaded parcels of land. Ditches were constructed to irrigate pastures—removing water from EF Beech Creek—and debris (wood) was removed from the stream to convey water and prevent flooding. Over time, trees adjacent to East Fork Beech Creek and its tributaries were removed for flood control, to protect infrastructure such as roads. Oregon Lumber Company once owned 104,514 acres of land partially overlapping the Magone planning area, which is adjacent to the Beech On/Off Allotment. Much of this land is now part of the Malheur National Forest. Forested areas adjacent to and partially within the Nipple Butte Inventoried Roadless Area (IRA) were logged, including the headwaters of Clear Creek, EF Beech Creek, and Grub Creek, as well as lower portions of McClellan Creek, Thompson Creek, and Clear Creek outside of the Nipple Butte IRA. East Fork Beech Creek and Grub Creek are entirely outside of the IRA, with the majority of their riparian habitat conservation areas experiencing timber harvest in the past 100 years.

Roads in the action area that occur within 100 feet of a stream floodplain and or intercept upland water conveyance or cross a stream commonly impact fish and fish habitat more than roads located in uplands. A high percentage of the roads in RHCAs in the action area are native surface roads. These roads adversely affect aquatic habitat by contributing fine sediment to streams, altering hydrology, transport sediment, and create a reduction in wood loadings (Meredith et al. 2014). Roads in the action area impact streams due to proximity within RHCAs and tend to be located 100 feet or less to the actual live channel (generally outside of 100 feet there is less likelihood for impacts in regards to shade and large wood as most trees on the forest are 90 feet tall or less). The floodplain within the action area on East Fork Beech Creek is less than 100 feet in width. The road locations and impacts to streams from roads can reduce availability of subsurface cool water storage cause or maintain stream conditions that are disconnected from their floodplains.

Some of the road-stream crossings in the action area have impacted local stream channels and water quality due to poor design with improperly sized culverts and misalignment relative to the natural stream channel. Those crossings located on alluvial fans can adversely impact width-to-depth ratio, sediment storage and conveyance, and pool formation for the primary habitat elements. Fine sediment is also a concern for roads that are hydrologically connected to disturbed areas. In the case of East Fork Beech Creek, and the lowermost sections of Clear Creek, Thompson Creek, and Ennis Creek, much of the wood that was historically present was systematically removed over the years for flood protection of the road and its infrastructure, as well as protection of outbuildings or homesteads that may have been located in the floodplain.

Past grazing management practices (prior to the 1990 Malheur Forest Plan) impacted existing aquatic habitat and water quality due to reductions in: Shade, bank-stabilizing wetland vegetation, and riparian hardwood

communities, along with stream bank alterations, increases in width-to-depth ratios and increased fine sediment levels. These impacts were exacerbated within areas that had been disturbed by logging. Improved management practices, on both private and Forest Service land, have resulted in some upward trends in aquatic conditions post 1990; however, riparian hardwood vegetation, stream channel morphology, and large woody debris are still in a degraded condition within the action area. Deer and elk also have impacted the shrub communities through browse use in some portion of riparian areas. Current stream temperatures are shown in the section 4.2.

Recreation impacts to streams in the action area primarily occur through road use providing access for hunting, fishing, hiking, firewood cutting, and dispersed camping. In the fall, deer and elk hunting are popular recreation activities within much of the action area. Dispersed campsites can have impacts to aquatic habitat and use of these sites varies throughout the year, with the majority of sites showing heaviest use during the fall hunting season.

There are no active mine claims in the action area nor have any historical records regarding mining been identified.

4.2 EXISTING CONDITION

For over 100 years, lands within the action area have been subjected to a variety of land-use activities. Practices have included fire suppression, timber harvest, road construction, silvicultural treatments, irrigation diversions, homesteading, and livestock grazing on public and private land, in addition to wildfire throughout the landscape. These activities have reduced aquatic species habitat quality and complexity of streams within the allotment. Past logging and road construction in RHCAs have reduced canopy cover in some areas, resulting in less shade over streams, and increased water temperatures.

Specific to this allotment, the riparian area along East Fork Beech Creek in Beech On/Off pastures (Beer and Patterson) is a mix of grass/forbs in the riparian understory, with a dominant presence of alders and other hardwoods in the middle sections. Figures 1-3 below give a general overview of stream conditions. Additional photos are on file and available upon request.

Figure 1. Above and below represent general conditions in Beef Pasture of E. Fk. Beech Creek in 2015.

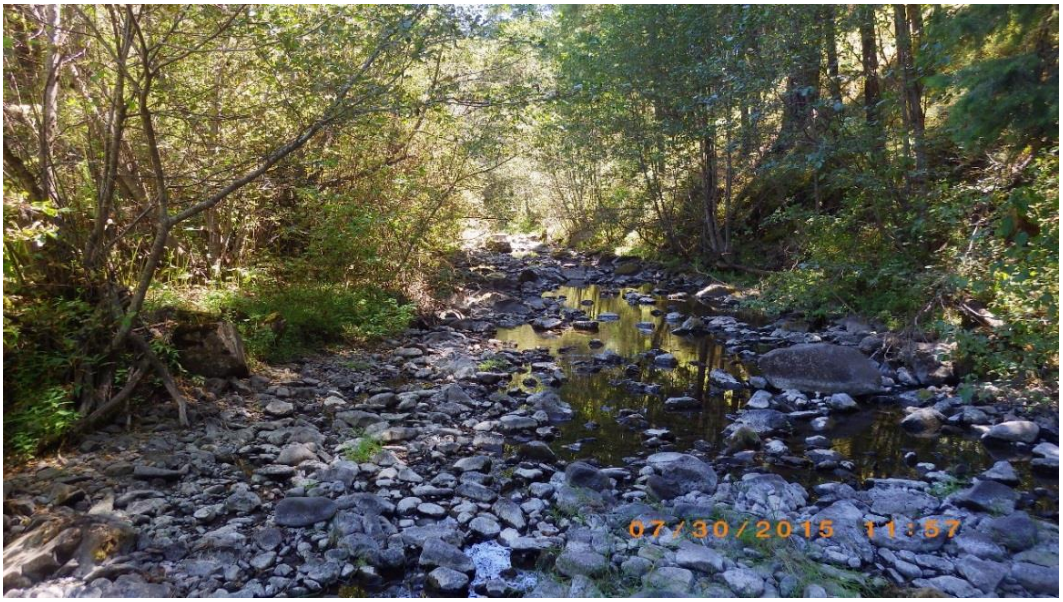

Figure 2. East Fork Beech Creek DMA looking downstream.

Figure 3. East Fork Beech Creek DMA looking upstream.

4.2.1 Beech Creek Allotment

This allotment is 1,977 acres of National Forest System land. It is operated by one permittee in conjunction with adjoining private land. It is permitted for 35 cow/calf (c/c) pair from 5/15-11/30 (Table 7).

Table 7. Beech Creek Allotment Permit Information

Permit Number	Permit Exp. Date	Total Acres	Permitted number of livestock c/c pair/AUMs/HMs	Permit season begin and end dates	Modifications by date	Reason for modification
0604010010	12/31/2023	1,663	35/304/230	5/15 to 11/30	5/23/2019	Removed the Fox Allotment from permit number 0604010010

Note: AUM use is calculated as the number of days the cattle are grazing a pasture multiplied by the number of cow/calf (1.32), then divided by 30.4167 (which is the average number of days in a month over a year) and rounded up to the whole AUM). A headmonth is one cow/calf pair for one month. Because the headmonth is the official unit of measurement for permitting on USFS lands, this BA is including both AUM and HM numbers. The AUMs and HMs as presented are interchangeable, meaning there is no increase or decrease in the permitted number of livestock on the allotments.

Pasture use information from 2018-2022 is available in Table 8 below. The ***Timber Pasture*** is a small pasture located in the North Fork John Day sub-basin and does not contain steelhead Critical Habitat. It will not be further discussed in this section. The following three sections discuss the existing condition with PIBO data available for the East Fork Beech monitoring sites, followed by additional available monitoring data. As previously highlighted, the two pastures with Critical Habitat are Beef and Patterson.

Beef Pasture

The Beef Pasture is located along county road 32 and contains approximately 360 acres of Forest Service land and 160 acres of private land. This pasture is run congruent with the private land owned by the permittee, including holding/loading corrals. This pasture contains most of the steelhead CH (and MSRA) in the allotment (East Fork Beech Creek) with the exception of a 15' water gap in the Patterson pasture. The Grouse Creek Pasture is fenced off from mainstem Beech Creek and does not contain steelhead CH and will not be discussed further.

Patterson Pasture

The Patterson Pasture is located south of County Road 32, and contains approximately 665 acres. This pasture contains a water gap of approximately 15 feet that allows cattle access to East Fork Beech Creek steelhead CH.

Grouse Pasture

The Grouse Pasture is located in two parcels that border State highway 395. It consists of approximately 1892 acres. The pasture is fenced off from the highway and has an adjacent PIBO DMA that is not within the pasture fence.

Table 8. Beech Creek Allotment Pasture Information 2018-2022

Pasture	Total Acres	Proposed season of use 2017	Actual Use Dates 2017	Proposed season of use 2018	Actual Use Dates 2018	Proposed season of use 2019	Actual Use Dates 2019	Proposed Season of Use 2020	Actual Use Dates 2020	Proposed Season of Use 2021	Actual Use Dates 2021	DMA (Y/N)
Beef	344	Rested	Rested	6/6-7/16	6/13-6/26	5/15-11/30	8/5-9/24	5/15-11/30	7/28-10/31	5/15-11/30	7/22-8/24 and 10/22-10/25	Yes
Patterson	1,020	5/15-6/15	6/30-9/26	5/15-6/15	11/6-11/30	5/15-11/30	10/7-11/30	5/15-11/30	10/28-11/30	5/15-11/30	8/24-11/30	No CH
Timber	94	10/5-10/18	7/8-8/18	10/5-10/18	6/13-6/15	5/15-11/30	7/1-7/14	5/15-11/30	8/24-9/7	5/15-11/30	8/10-9/2	No CH
Grouse	519	5/15-6/11	10/4-11/30	5/15-6/11	11/7-11/30	5/15-11/30	10/18-11/30	5/15-11/30	9/29-11/30	5/15-11/30	10/15-11/29	No CH

4.2.1.1 PIBO Data Overview

The following provides a summary of data collected by the PIBO Effectiveness Monitoring Program (EMP) for monitoring locations within the Beech Creek Allotment. Sites included within the summary are: 1) integrator PIBO monitoring sites chosen within randomly selected sub-watersheds to show integrated effects of upstream management— most are located in the most downstream response reach (stream gradient less than 3%), while the remaining at the downstream most transport reach (stream gradient between 3 and 5%); and 2) PIBO Designated Monitoring Area (DMA) (K sites) located within each randomly selected sub-watershed where livestock grazing occurs within the riparian area. Locations for K sites are selected by Ranger Districts and used for annual implementation monitoring, as well as MIM methods are used at some of these same sites for annual indicator monitoring by the Forest Service. The objective is to develop a link between implementation and effectiveness monitoring as part of an adaptive management feedback process.

Two PIBO sites (one Integrator (I) site and one DMA (K) site) are located in the Beef Pasture on E.F. Beech Creek. Monitoring occurred at the integrator site four times between 2001 and 2016, and occurred two times on the K site in 2011 and 2016. Additional data is not yet available for these sites.

Integrator Site Results- Within this monitored reach, the data suggests that the total index rating, bankfull width-to-depth, bank angle, undercut banks, and percent pools has improved during the monitoring period. The data also suggests a small increase in the percent fines, with a decrease in median particle size seen over the period. The remainder of the indicators appear to show a static trend (bank stability, rating, residual pool depth; see Table 9 below).

PIBO DMA (K) site Results– Within this monitored reach the data suggests that the bankfull width-to-depth ratio, percent pools, bank stability, bank angle, and undercut banks have improved during the monitoring period. Similar to the nearby I site, there was an increase in the percent fines, with a corresponding decrease in median particle size.

Table 9. PIBO monitoring results (2001 – 2016) for the Beech Creek allotment.

Stream and Site Name and Type	Pasture	Year	Total Index	Bankfull W/D	Median Part. Size (D50) (mm)	Pool (%)	Res. Pool depth (m)	%Fines <2mm (%)	%Fines <6mm (%)	Bank Stab (%)	Veg Bank Stab. (%)	Bank Angle (°)	Under-cut Banks (%)	GL Wet Rat	GL Woody CV
East Fork Beech Creek 155-02-I	Beef	2001	-	29.1	51	46	0.3	-	-	100	90	135	13.2	-	-
		2006	32.5	26.5	61	23	0.3	2.9	3.6	100	91	142	8.9	71.2	39.5
		2011	40.3	18.5	56	24	0.4	6.4	11.3	95.2	71	131	12.2	66.2	87.9
		2016	45.4	12.0	49	62	0.3	9.2	10.9	100	98	126	13.6	-	-
East Fork Beech Creek 155-02-K	Beef	2011	43.6	17.0	51	24	0.4	3.5	11.0	97.6	60	144	7.1.	72.0	52.8
		2016	39.3	13.1	40	60	0.2	13.8	15.7	100	86	127	21.4	-	-
PIBO Managed Mean		-	-	23.9	43.0	40.9	0.26	-	26.7	74.6		108	26.4	-	-
PIBO Reference Mean		-	-	22.6	58.0	43.3	0.31	-	18.0	79.9		99.3	32.7	-	-
RMSE		-	-	4.0	13.8	12.9	.027	-	4.9			6.5		-	-
FLMP standard		-	-	-	-	-	-	<20	<20	>90		>75% with 90 degree angle (or over)	50-75%	-	-

Stream is the stream name. **Site ID** is the PIBO site identification number. **Site Type** is the PIBO sample type where I = instream habitat, S= annual sentinel sites, P=Prairie Sites, K=Designated monitoring Area. R is a random site with no plans for repeat observation. **Year** is year of last sampling. **Total Index** is the index of physical habitat where numeric score 0 (worst) - 100 (best) that ranks the habitat integrity of a reach [Index score calculated by summing values of 6 metrics (residual pool depth, % pools, D50, % pool tail fines <6mm, large wood frequency, average bank angle) and scaling 0 - 100. Index was developed using data from reference reaches as a basis of comparison to managed sites. **Bankfull W/D** is the bankfull width-to-depth ratio. **Median Part. Size (D50)** is the diameter of the mean 50th percentile streambed particle. **Pool %** is the percent of pools within the reach. **Res. Pool depth** is the average of the residual depth of pools in the sample reach. **%Fines <2mm** is the percent of pool tail fines less than 2mm. **%Fines <6mm** is the percent of pool tail fines less than 6mm. **Bank stab** is percent of stable banks over the sample reach. **Veg Bank Stab.** Is the percent of vegetatively stable banks. **Bank angle** is the average of bank angles across the sample reach. **Undercut** is the percent of angles < 90 degrees. **GL Wet Rat** is the greenline wetland rating where 1=upland, 25= facultative upland, 50=facultative, 75=facultative wet, 100=obligate wetland). **GL Woody CV** is the greenline woody cover (the sum of the relative cover of woody species out of 200% due to shrub canopy). **RSM**E = Root Mean Square Error. Useful in quantifying site-specific estimates of temporal variability – typically used with multiple linear regression. The RMSE is the square root of the variance of the residuals. It indicates the absolute fit of the model to the data–how close the observed data points are to the model's predicted values.

4.2.1.2 PIBO Discussion

There have been two reach evaluations (sites evaluated two or more times) on East Fork Beech Creek within the Beech Creek Allotment between 2001 and 2016. Within these monitored reaches the data presented in Table 9 indicates improvement in the overall Total Index score, width: depth, and percent pools for the PIBO I site. Other attributes are remaining relatively stable or have too few data points to interpret.

Based upon pools per kilometer data collected by PIBO surveys, the 2001 measurements at East Fork Beech Creek would meet the NMFS MPI criterion for pool frequency. Pool frequency declined between 2001 and 2006 but has increased from 2006 to 2016.

The bankfull width-to-depth ratios have decreased steadily at the integrator (I) site between 2011 and 2016 from 29.1 to 12.0. It should be noted that the protocol for width: depth measurements from 2001-2008 was an average of the bankfull width-to-depth ratios from four channel cross-sections. The cross-sections were measured at the widest location (bankfull width) in the first four riffles within straight stream segments. In 2009 the protocol changed to an average of the bankfull width-to-depth ratio from 10 cross sections at / near even numbered transects 2-20. If there were <6 suitable measurements no value was reported. Each ratio was calculated as bankfull width divided by the bankfull depth. Bankfull depth was calculated as the total bankfull area divided by the bankfull width. Even with the change in protocol the w:d ratio improved (narrowed) from 2011 to 2016 at the I site. No bankfull width to depth ratio calculations met the NMFS MPI criteria for PF of less than 10. The bankfull width to depth ratio also decreased from 2011 to 2016 in East Fork Beech Creek K site dropping from 17 to 13.

Percent pool estimates ranged from 23-62%. Both sites had 24% pools in 2006 then exceeded 50% pool area in 2016. Mean residual pool depth was deepest at the I site in 2011 at 0.4 m, as was the K site. Raw data are not available to evaluate the NMFS MPI criterion for pool quality (presence of pools greater than one meter in depth). However, the 2014 stream survey data available for the East Fork Beech Creek also found no pools greater than one meter in depth in the vicinity of Beef and Patterson pastures

The NMFS MPI utilizes 90 percent stability for the stream bank condition indicator. Banks were greater than 90% percent stable at both sites for all years, which would rate PF using NMFS MPI criteria. Percent undercut banks increased at both sites between 2011 and 2016, after a small decrease at the I site from 2001 to 2006. They did not meet the PACFISH RMO of over 75 percent undercut, and the current condition of the stream is not conducive to undercut banks (large cobble material making up the banks and substrate).

The D50 (median particle size) of the substrate ranged from 40 to 61 mm (gravel) and has decreased slightly from 2011 to 2016 from 56 to 49 mm at the I site and 51 to 40mm at the K site. The percent fine sediment smaller than 2 mm in diameter at pool tail-outs at the I site has increased from 2.9 to 9.2% between 2006 and 2016. The percent fine sediment smaller than 6 mm decreased slightly from 11.3 to 10.9 mm. At the K site, the percent fines less than 2mm and less than 6 mm has increased slightly from 2011 to 2016 (from 3.5 to 13.8 percent <2 mm and 11.0 to 15.7 percent <6 mm). Both sites remained below the FLMP standard of <20 percent. The PIBO data for the 2 mm size class is conservative in contrast to the NMFS MPI criterion of fines in gravel <0.85 mm.

The greenline wetland rating (GWR) is a measure of the abundance of wetland species along the streambank. A wetland rating of 100 indicates all obligate wetland species and a rating of 1 indicates all upland species. The rating is calculated for each reach by summing the product of the relative cover of each species for which a wetland indicator status can be determined and a value corresponding to the species' wetland indicator status

(1=upland, 25= facultative upland, 50=facultative, 75=facultative wet, 100=obligate wetland (Coles-Ritchie et al. 2007). The GWR values of 71.2 in 2006 and 66.2 in 2011 for the I site, and 72 for the K site in 2011 indicate a majority presence of wetland species along the streambank. The 2016 PIBO data for this indicator was not available.

Greenline woody cover (GWC) is the sum of the percent cover of woody species along the greenline. These could be any woody species, such as willows, pines, or currants. Greenline woody cover can be up to 200 percent because cover estimates are a combination of two layers. Estimates suggest an increase between 2006 and 2011 from 39.5 to 87.9 percent at the I site and one measurement of 52.8 % at the K site in 2011.

In summary, some habitat measurements have improved at the East Fork Beech sites including bankfull width-to-depth ratios and percent pools, while others have remained static or have varied throughout the monitoring years. There are too few reference sites within the John Day Basin to determine whether similar changes are occurring in unmanaged watersheds. However, bankfull width-to-depth ratios and percent pools showed improvement, this is actually a promising indicator given that both Bengeyfield (2006) and Rosgen (1996) have indicated that the relationship between a stream's width and depth is perhaps the most revealing of all stream channel indicators as to whether the stream is in a condition to perform the various tasks that lead to a healthy riparian area.

While some attributes, such as channel shape and the frequent floodplain, are generally formed in 1.5-2 year events, others, such as habitat complexity, are formed during moderately high events of 10-25 year return intervals. If the stream cannot maintain its dimension, pattern, and profile during these moderately high events, then habitat or other desired values would probably not be created or sustained over time. Thus, given the short five-year time frame between site visits for monitoring and developing trends, and the analysis of data, observations indicate that most evaluated attributes are being maintained or showing a slight overall improvement.

4.2.1.3 Evaluation of Existing Conditions to PIBO Managed and Reference Means

Identifying the existing condition of streams within a particular watershed or management area is an important step in evaluating how land management may be affecting the quality of stream habitats. To help assess these conditions, we are using recent information from the PIBO EMP to represent mean habitat conditions for both managed and reference conditions (Table 9). The PIBO EMP developed an index of physical habitat conditions using 8 commonly collected stream habitat monitoring metrics by evaluating the status and condition of 217 reference and 934 managed streams in the Interior Columbia River and Upper Missouri River Basins (Al-Chokhachy et al. 2010).

Comparing PIBO monitoring data from sites in Beech Creek On/Off Allotment (Table 9) to PIBO Reference Means where appropriate, helps provide for the evaluation of management practices to determine if they are effective in maintaining the desired and/or proper functioning condition, or improving the structure and function of riparian and aquatic conditions.

In some cases the PIBO data can be used to compare to RMO's which are Forest Plan standards (especially for bankful width:depth; percent pools; percent fine sediment; bank stability; bank angle; percent undercut banks; and temperature). The PIBO data is also used to evaluate the stream objectives in the NMFS MPI table and allows for a review of macroinvertebrate data that helps evaluate the biological integrity of streams in the action area (Hargett, E.G. et. al. 2007, Herbst D.B. et al. 2012).

Kershner and Roper (2010) found that not all reference sites (streams where minimal land use effects have occurred) were statistically different from managed sites, including for indicators such as wetted width-to-depth (which is not a measure used in these BA's where bankful width-to-depth is used), bank stability, percent undercut banks, and pools/kilometer. There was significant difference between reference and managed reaches for number of pieces of large wood, numbers of days exceeding 15°C, percent fines in riffles, and median particle size. Forest type was found to explain some of the differences. These authors also stated that the current RMOs were designed as an early warning of potential negative effects of land management on stream/riparian conditions. They pointed out that values that did not meet RMOs were originally thought to potentially represent unsuitable habitat conditions for important salmonids. Their analysis of data from federally managed sites in the interior Columbia River basin indicated that the usefulness of RMOs may be questionable. In summary, they found that none of the 726 reference and managed reaches surveyed met all RMOs, and in a previous analysis (Henderson et al. 2005) found that only 2% of the reference reaches met the RMO for wetted width-to-depth ratio and that 16% met the reference criteria for percent undercut banks. This high natural variability of streams in the range of PACFISH/INFISH complicates setting threshold values that define "good habitat".

The authors acknowledged that one of the drawbacks of the use of RMOs has been to disregard the role of disturbance in shaping stream habitats. Natural disturbances play an imperative role in shaping the setting of streams and the conditions that are found within them (Benda et al. 1998). They went on to say that it is apparent that all streams will most likely not meet all habitat objectives during some point in their history as the series of natural disturbances both influences and resets them. In fact, some of the PIBO reference sites come from wilderness areas that have experienced severe disturbance from wildfires and associated debris flows. These sites provide valuable information when describing the distribution of conditions that may be possible in a reference setting and provide important information on recovery trajectories in the absence of land management. The reference values from the PIBO program continue to represent conditions for evaluation of data collected at PIBO sites within the MNF. The information obtained from PIBO data to compare to RMOs does not provide rigid pass/fail criteria but allows for the assessment of conditions that may be causing objectives to not be met. Especially useful are the sites on the MNF where at least three years of PIBO data have been collected over 15 years.

At the scale of the Beech Creek Allotment, the two monitoring sites presently show bankfull width-depth ratios within PIBO managed and reference mean values, and both sites currently exhibit bank stability, D50, percent pools, and percent fines <6mm within managed mean values, and bank stability, percent pools and percent fines < 6 mm within reference mean values. Thus, a cursory examination of the data reveals that stream attributes considered to be potentially affected by livestock grazing (bankfull width-depth ratios, bank stability, D50 and percent fines <6mm), are found to be within PIBO managed mean values, and mostly within reference mean values (except D50), whereas bank angle and percent undercut banks are departed from (not as good as) managed and reference mean values.

As discussed earlier, a channel's bankfull width-depth ratio is an important indicator of whether a stream is able to perform the various tasks that lead to a healthy riparian area. This indicator, along with appropriate riparian vegetation, is critically important for a stream to maintain its dimension, pattern, and profile even during moderate to high (10-25+ year return intervals) flow events. If continued monitoring shows that overall channel shape was maintained, the expected outcome will be improvement in the other stream attributes, thereby enhancing habitat complexity.

The results of this analysis can further be used to assist in the evaluation of other important parameters, such as water temperature in low-gradient alluvial systems, as they are directly tied to stream morphology (e.g., width/depth ratio) and vegetative cover. For example, as the streams narrow and deepen over time in an

improving trajectory, water temperatures will be less susceptible to diurnal fluctuations, and as inflow from stored water in riparian banks increases, cooler water temperatures in summer and warmer temperatures in winter would be expected. Thus, the evaluation of trend in stream morphology attributes such as width/depth ratio can help inform the Line Officer or Manager about other important fish habitat elements.

The temperatures collected between 7/15 and 8/31 in 2002, 2006, and 2016 at the PIBO I site were 23.5C (74F), 19.8C (68F), and 18.7C (65F) respectively, perhaps reflecting the narrowing and deepening of the stream as indicated by the improving (lowering) of the w:d ratio and increased greenline woody cover.

4.2.1.4 Evaluation of Existing Conditions to PIBO Managed and Reference Means at the 8-digit HUC Scale

An assessment of the status and trend of stream habitat conditions in the MNF at the forest and sub-basin (8 digit HUC) scale was completed by the PIBO Monitoring Program in 2017 and 2021 (Appendix B). This summary estimates by measuring changes in the individual stream habitat metrics, such as bank stability or large wood frequency, at a site over the duration of PIBO sampling (2001-2021). For complete details and description of methods see Archer and Ojala (2017).

Overall, across the Upper John Day Basin, trend data shows a significant improvement in pool percent (PIBO DMAs), as well as large wood frequency (PIBO Integrators). There has also been a slight improvement in bank angle, undercut bank percent, pool fines, mean substrate, pool percent (PIBO Integrators), as well as pool fines, bank angle and undercut bank percent (PIBO DMAs). The remaining parameters show a slight change opposite of the desired direction, with residual pool depth showing a significant negative trend (PIBO DMAs).

Although several habitat metrics exhibited some improvement, only 3 parameters showed significant trends ($P < 0.10$), with 2 of those being in the desired direction. Additionally, the majority (roughly three-fourths) of the parameters showed only slight changes + or – ($P > 0.10$), and thus ***overall trend*** is deemed to be ***relatively static***. While trends for some of these parameters show improvement, ***the status of most of the habitat metrics*** (except pool percent, mean substrate and % pool fines) ***are still moderately to highly departed from reference conditions.***

4.2.2 **Multiple Indicator Monitoring (MIM)**

Short term MIM data has been summarized and provided to the services every year. For the latest summary, see page 57 the 2021 EOY Report (Appendix F). Standards have not been exceeded over this consultation period.

4.2.3 Spawning Surveys

Spawning surveys have observed redds within the Beef and Patterson pastures during the last 5 years. The entire MSRA within the pastures are surveyed during monitoring, and protection has been successfully implemented and documented when redds have been encountered. The table below provides a summary of redds found per year within each pasture. Photos and site-specific data taken during the surveys are on file and available upon request

Table 10. Spawning Survey Results

Pasture and Use Dates	Stream	# Redds Observed 2018	# Redds Observed 2019	# Redds Observed 2020	# Redds Observed 2021	# Redds Observed 2022
Beef	EF Beech Creek		0	1	2	1
Patterson	EF Beech Creek	0	0	0	0	1

4.2.4 Region 6 Level II Stream Surveys

East Fork Beech Creek was surveyed in 1993, 2014, and in 2019. The stream runs through portions of the Beech Creek, Herberger, John Day, McCullough, and Roundtop allotments. Steelhead critical habitat streams tributary to East Fork Beech Creek (Hog Creek, Johnson Creek, Ennis Creek, Clear Creek, and McClellan Creek) are all located in the John Day allotment. The stream is approximately 13 miles long, of which 11.7 miles of stream on National Forest System lands was surveyed in both 1993 and 2019. Conditions have improved since 1993 when grazing and other historical uses resulted in poor riparian conditions, high amount of unstable stream banks, and high cobble embeddedness. The average gradient is 2.5% and active recent stream restoration has occurred in Reaches 1, 3, and 5 with the addition of large wood and Beaver Dam Analogs (BDAs). Log weirs installed in the 1970's or 80's are still located in the upper reaches of the stream. Reaches 2, 4, and 6 are within private land. Beavers were present in the creek in both 1993 and in 2019. Overall East Fork Beech Creek still lacks pool habitat and large wood, except where recently added with restoration. Width to depth ratios are higher than desired. Gravel and cobble dominate all the surveyed reaches except the upper two where fines increase. Redds are observed in low numbers in most years in surveyed portions of East Fork Beech Creek. Photos taken during the surveys are on file and available upon request

Seven primary habitat elements from the most recent Region 6 stream surveys for streams on public land within the Patterson and Beef pastures in the Beech Creek on/off Allotment are illustrated (Table 11). Shaded values (Reachs 3 and 5) indicate reaches within the Beech Creek on/off allotment. Values in bold text met one or more of the following: standards for RMOs and Amendment 29, or the Properly Functioning classification of the NMFS MPI. See Table 11 below for more details.

Table 11. Existing Condition from 2019 R6 Stream Surveys for Seven Primary Habitat Elements

Stream, Reach, and Survey Year	Length (mile) and gradient	Pools per mile and Residual Depth (ft)	Shade (%) in July	Fine sediment < 2mm (percent)	Gravel substrate (percent)	Width to Depth ratio (Bankfull)	Average Percent unstable banks	Large wood per mile
East Fk Beech Cr R1 2019	1.6/1.9%	24/mi. 1.6 ft.	34	21	66	24	**3**	**44**
East Fk Beech Cr R3 2019	1.8/1.5%	44/mi. 1.9 ft.	**55**	**18**	46	22	**0.4**	76
East Fk Beech Cr R5 2019	1.2/2.6%	36/mi. 1.5 ft.	**54**	**18**	49	12	**0**	**54**
East Fk Beech Cr R7 2019	1.6/2.8%	37/mi. 1.2 ft.	**70**	**16**	51	11	**0.1**	1.3
East Fk Beech Cr R8 2019	0.7/3.1%	31/mi. 0.9 ft.	**81**	32	36	15	**0**	7.4
East Fk Beech Cr R9 2019	4.9/3.3%	4/mi. 1.2 ft.	**62**	26	53	18	**5.7**	14.5

Table 12 displays the degree to which the 2019 stream inventory information meets the numeric standards or classifications described in RMOs, Amendment 29 or the NMFS MPI for this allotment. The data for all stream reaches is used when making this judgment call. The acronym NA is used when there is no standard. NMFS MPI acronyms for condition classifications PF (properly functioning), AR (at risk), and NPF (not properly functioning are used in the table.

Table 12. Degree to which 2019 stream inventory data meets numeric standards or classifications described in RMOs, Amendment 29 or the NMFS MPI.

	RMOs	Amendment 29	NMFS MPI
Pools/mile	Does not meet	Does not meet	NPF
Shade % (densiometer)	NA	Meets	NA
Large Woody Debris (/mile)	Does not meet.	Does not meet	NPF
Fine sediment % < 2mm	NA	NA	PF
Width to Depth Ratio	Does not meet	Does not meet	NPF
Bank Stability (%)	Meets	Meets	PF

4.2.5 Water Temperature Monitoring

Water temperature data was collected by the PIBO team in East Fork Beech Pasture at the I site (155-02) from July 15 to August 31 in 2002, 2006, and 2016. The weekly maximum temperature (WMT) for each of those years was 19.8C (68F), 23.5C (74F), and 18.7C (66F) respectively. There are no additional long-term water temperature monitoring sites within the Beech Creek on-off Allotment. Table 13 presents water temperature information for E.F. Beech Creek near the Patterson and Beef pastures from 2014 monitoring data. Figure 4 graphically represents water temperature data from E.F. Beech Creek in 2014.

Water temperature influences the metabolism, behavior, and health of fish and other aquatic organisms. Fish can survive at temperatures near extremes of suitable temperature ranges; however, growth is reduced at low temperatures because all metabolic processes are slowed. At the opposite extreme, growth is reduced at high temperatures because most or all energy from food must be used for maintenance needs. Juvenile fishes have a narrower thermal niche and lower tolerance for temperature fluctuations than do adults (Elliot 1994).

Mean maximum water temperatures are above the suitable range for salmonid species present during summer months in East Fork Beech Creek. The Malheur Forest Plan standard for water temperature is for no measurable increase in maximum water temperature, and the PACFISH riparian management objective (RMO) is for maximum water temperatures below 64 °F within migration and rearing habitat and below 60 °F within spawning habitats. The average 7-day maximum stream temperature across the project planning area was 74.3 °F (Table 13).

Riparian stream shading is critical in regulating water temperature extremes and providing in-stream cover against predation. Riparian vegetation can decrease water temperature as much as 3 to 4 °C (37.4 to 39.2 °F) within 492 feet by reducing incoming solar radiation as well as air temperature (Johnson 2004). Additionally, streambed substrates play a role in diurnal water temperature fluctuations. Daily maximum temperatures were higher and minimum temperatures were lower in streambeds composed of bedrock (Johnson 2004). Complex flow paths within alluvial streams (cobble/gravel) results in slow median water velocities, and therefore longer hydraulic retention times. These slow velocities led to mixing of daytime and nighttime water between and within the channel and hyporheic zone (Johnson 2004). Accumulations of large organic matter inputs (coarse wood/large wood) with fine material have an effect on hydraulic retention times, which also mediates water temperature (Johnson 2004).

Stream surveys indicate that shade objectives are being met within the East Fork Beech Creek Reaches 1–11 (Ponderosa Pine 20-50%). The shade metrics by stream reach are summarized in **Error! Reference source not found.** and Table 13.

Table 13. Stream Survey Results for Shade % and the 7-day Mean Maximum Water Temperature for E.F. Beech Creek in 2014.

Stream name	Survey year	Water temperature	
		7-day mean maximum	Shade % (with Solar Pathfinder)
EF Beech Creek Reach 1	2014	74.3 °F (6/11-10/5)	**71.0**
EF Beech Creek Reach 3	2014	_	**65.0**
EF Beech Creek Reach 5	2014	_	**63.5**
EF Beech Creek Reach 7	2014	_	**85.0**
EF Beech Creek Reach 8	2014	_	**67.5**
EF Beech Creek Reach 9	2014	_	**67.5**
EF Beech Creek Reach 10	2014	_	**64**
EF Beech Creek Reach 11	2014	_	**50.5**

Values in **bold** font are meeting fish habitat objectives, values not bold are not meeting fish habitat objectives.

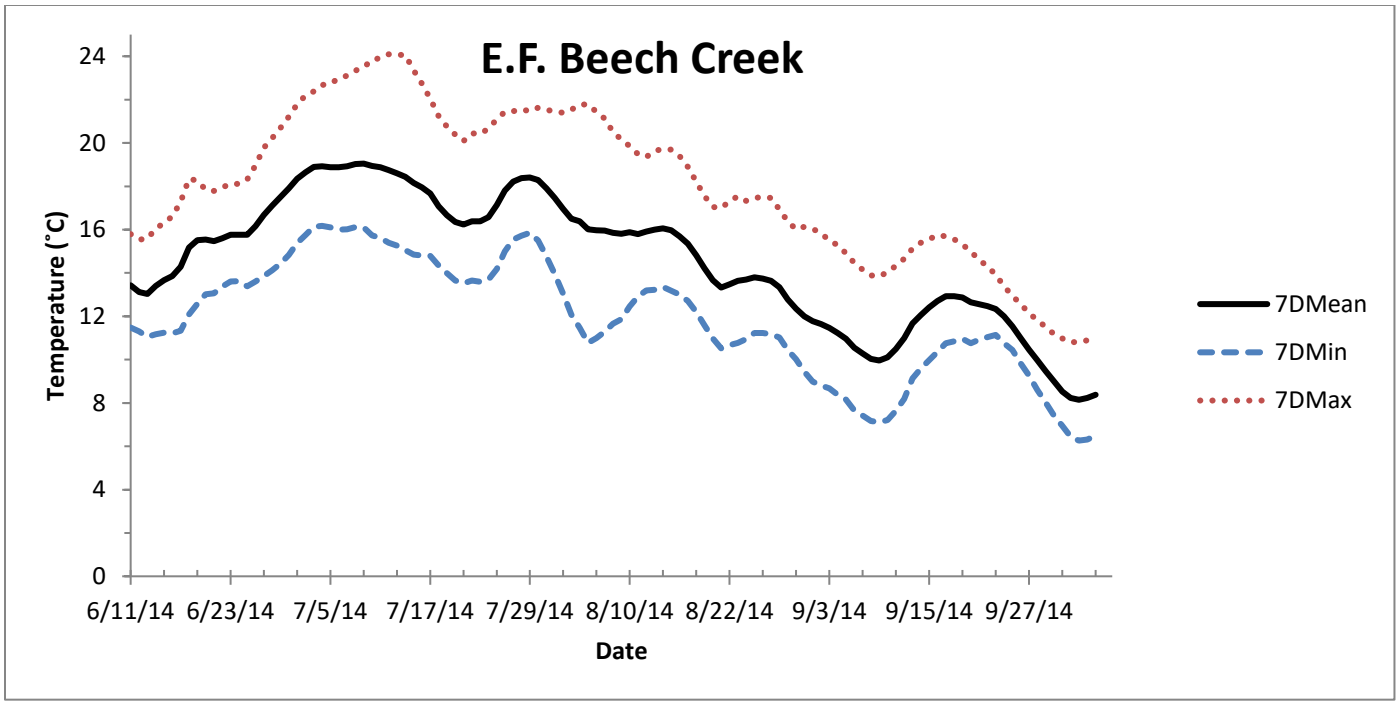

Figure 4. Average 7 Day Mean, Maximum, and Minimum Temperature for E.F. Beech Creek, 2014.

4.3 MATRIX OF PATHWAYS AND INDICATORS AT THE 8 DIGIT AND 10 DIGIT HYDROLOGIC UNIT CODE (HUC)

A NMFS process paper titled "Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale" (National Marine Fisheries Service 1996) is used to describe the environmental baseline for steelhead. It is commonly known as the NMFS Matrix of Pathways and Indicators, hereafter referenced as the "NMFS MPI." The NMFS MPI identifies indicators to analyze for the following pathways: 1) Water quality; 2) Habitat access; 3) Habitat elements; 4) Channel condition and dynamics; 5) Flow/hydrology; and, 6) Watershed condition. The condition of each indicator is described as either "Properly Functioning" (PF), "At Risk (AR)," or "Not Properly Functioning (NPF)" based upon specific numeric or qualitative criteria. **Error! Reference source not found.** shows the current status of the environmental baseline using the NMFS MPI for the Upper John Day River subbasin. MSRA habitat in the Beech Creek on/off Allotment is limited to E.F. Beech Creek located in beef and Patterson pastures in this subbasin. **Table cells in bold print indicate the current status of each indicator.** The habitat indicators in the NMFS matrix also correspond to the Primary Constituent Elements (PCEs) of designated CH for MCR steelhead. The relationship between NMFS MPI and the PCEs of CH is discussed in the Analysis of Effects to Designated CH.

Table 14. Status of environmental baseline for the Upper John Day Subbasin.

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Water Quality	Temperature	50 – 57° F (max 7-day average)	57 – 61° F (spawning, max 7-day average)	**> 61° F (spawning, max 7-day average)**
			57 – 64° F (migration and rearing, max 7-day average)	**> 64° F (migration and rearing, max 7-day average)**
	Sediment	< 12% fines (<0.85mm) in gravel	12 – 20% fines	**> 20% fines**
	Chemical Contaminants or Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients; no CWA 303d designated reaches	**Moderate levels of chemical contamination from agricultural, industrial, and other sources; some excess nutrients; one CWA 303d designated reach**	High levels of chemical contamination from agricultural, industrial, and other sources; high levels of excess nutrients; more than one CWA 303d designated reach
Habitat Access	Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows	Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at base/low flows	**Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at a range of flows**
Habitat Elements	Substrate	Dominant substrate is gravel or cobble (interstitial spaces clear), or embeddedness <20%	Gravel and cobble is subdominant, or if dominant, embeddedness 20 – 30%	**Bedrock, sand, silt, or small gravel dominant, or if gravel and cobble dominant, embeddedness >30%**
	Large Woody Debris	> 20 pieces/mile (> 12 inch diameter and > 35 ft. length), and adequate sources of woody debris recruitment in riparian areas	Currently meets standards for Properly Functioning, but lacks potential sources from riparian areas of woody debris recruitment to maintain that standard	**Does not meet standards for Properly Functioning and lacks potential large woody debris recruitment**

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
	Pool Frequency	Meets pool frequency standards and meets large woody debris recruitment standards for Properly Functioning habitat	Meets pool frequency standards but large woody debris recruitment inadequate to maintain pools over time	**Does not meet pool frequency standards**
	Pool Quality	Pools > 1 meter deep (holding pools) with good cover and cool water; minor reduction of pool volume by fine sediment	Few deeper pools (> 1 meter) present or inadequate cover/ temperature; moderate reduction of pool volume by fine sediment	**No deep pools (> 1 meter) and inadequate cover/temperature; major reduction of pool volume by fine sediment**
	Off Channel Habitat	Backwaters with cover, and low energy off-channel areas (ponds, oxbows, etc.)	**Some backwaters and high energy side channels**	Few or no backwaters; no off-channel ponds
	Refugia	Habitat refugia exist and are adequately buffered (e.g., by intact riparian reserves); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or subpopulations (all life stages and forms)	Habitat refugia exist but are not adequately buffered (e.g., by intact riparian reserves); existing refugia are insufficient in size, number, and connectivity to maintain viable populations or subpopulations (all life stages and forms)	**Adequate habitat refugia do not exist**
Channel Condition & Dynamics	Width/Depth Ratio	< 10	10 – 12	**> 12**
	Stream Bank Condition	> 80% of any stream reach has > 90% stability	**50 – 80% of any stream reach has > 90% stability**	< 50% of any stream reach has > 90% stability
	Floodplain Connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland functions, riparian vegetation, and succession	Reduced linkage of wetland, floodplains, and river areas to main channel; overbank flows are reduced relative to historic frequency, as evidenced by moderate degradation of wetland function and riparian vegetation/succession	**Severe reduction in hydrologic connectivity between off-channel, wetland, floodplain, and riparian areas; wetland extent drastically reduced, and riparian vegetation/success altered significantly**
Flow/Hydrology	Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of similar size, geology, and geography	Some evidence of altered peak flow, base flow, and/or flow timing relative to an undisturbed watershed of similar size, geology, and geography	**Pronounced changes in peak flow, base flow, and/or timing relative to an undisturbed watershed of similar size, geology, and geography**

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
	Increase in Drainage Network	Zero or minimum increases in drainage network density due to roads	Moderate increases in drainage network density due to roads (e.g., 5%)	**Significant increases in drainage network density due to roads (e.g., 20 – 25%)**
Watershed Condition	Road Density & Location	< 2 mi/miP2P; no valley bottom roads	2 – 3 mi/miP2P; some valley bottom roads	**> 3 mi/miP2P; many valley bottom roads**
	Disturbance History	< 15% ECA (entire watershed) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or riparian areas	**< 15% ECA (entire watershed) but disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian areas**	> 15% ECA (entire watershed) and disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian areas
	Riparian Management Areas	The riparian reserve system provides adequate shade, large woody debris recruitment, and habitat protection and connectivity in all subwatersheds, and buffers or includes known refugia for sensitive aquatic species (>80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition > 50%	Moderate loss of connectivity or function (shade, LWD recruitment, etc.) of riparian reserve system, or incomplete protection of habitats and refugia for sensitive aquatic species (~ 70 – 80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition 25 – 50% or better	**Riparian reserve system is fragmented, poorly connected, or provides inadequate protection of habitats and refugia for sensitive aquatic species (< 70% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition < 25%**
[1]**Bold** text in table cells indicates current status of the indicator				

Table 15. Status of environmental baseline for the Beech Creek Ten Digit Watershed (HUC 1707020108).

Indicators	Properly Functioning	At Risk	Not Properly Functioning
Water Quality			
Temperature	50 – 57° F (max 7-day average)	57 – 61° F (spawning, max 7-day average)	**> 61° F (spawning, max 7-day average)**
		57 – 64° F (migration and rearing, max 7-day average)	**> 64° F (migration and rearing, max 7-day average)**
Sediment	< 12% fines (<0.85mm) in gravel	12 – 20% fines	**> 20% fines**
Chemical Contaminants or Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients; no CWA 303d designated reaches	**Moderate levels of chemical contamination from agricultural, industrial, and other sources; some excess nutrients; one CWA 303d designated reach**	High levels of chemical contamination from agricultural, industrial, and other sources; high levels of excess nutrients; more than one CWA 303d designated reach
Habitat Access			
Physical Barriers	Any man-made barriers present in watershed allow	Any man-made barriers present in watershed do not allow upstream and/or	**Any man-made barriers present in watershed do not allow upstream**

Indicators	Properly Functioning	At Risk	Not Properly Functioning
	upstream and downstream fish passage at all flows	downstream fish passage at base/low flows	**and/or downstream fish passage at a range of flows**
Habitat Elements			
Substrate	Dominant substrate is gravel or cobble (interstitial spaces clear), or embeddedness <20%	Gravel and cobble is subdominant, or if dominant, embeddedness 20 – 30%	**Bedrock, sand, silt, or small gravel dominant, or if gravel and cobble dominant, embeddedness >30%**
Large Woody Debris	> 20 pieces/mile (> 12 inch diameter and > 35 ft. length), and adequate sources of woody debris recruitment in riparian areas	Currently meets standards for Properly Functioning, but lacks potential sources from riparian areas of woody debris recruitment to maintain that standard	**Does not meet standards for Properly Functioning and lacks potential large woody debris recruitment**
Pool Frequency	Meets pool frequency standards and meets large woody debris recruitment standards for Properly Functioning habitat	Meets pool frequency standards but large woody debris recruitment inadequate to maintain pools over time	**Does not meet pool frequency standards**
Pool Quality	Pools > 1 meter deep (holding pools) with good cover and cool water; minor reduction of pool volume by fine sediment	Few deeper pools (> 1 meter) present or inadequate cover/ temperature; moderate reduction of pool volume by fine sediment	**No deep pools (> 1 meter) and inadequate cover/temperature; major reduction of pool volume by fine sediment**
Off Channel Habitat	Backwaters with cover, and low energy off-channel areas (ponds, oxbows, etc.)	**Some backwaters and high energy side channels**	Few or no backwaters; no off-channel ponds
Refugia	Habitat refugia exist and are adequately buffered (e.g., by intact riparian reserves); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or subpopulations (all life stages and forms)	Habitat refugia exist but are not adequately buffered (e.g., by intact riparian reserves); existing refugia are insufficient in size, number, and connectivity to maintain viable populations or subpopulations (all life stages and forms)	**Adequate habitat refugia do not exist**
Channel Condition & Dynamics			
Width/Depth Ratio	< 10	10 – 12	**> 12**
Stream Bank Condition	> 80% of any stream reach has > 90% stability	**50 – 80% of any stream reach has > 90% stability**	< 50% of any stream reach has > 90% stability
Floodplain Connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland functions, riparian vegetation, and succession	Reduced linkage of wetland, floodplains, and river areas to main channel; overbank flows are reduced relative to historic frequency, as evidenced by moderate degradation of wetland function and riparian vegetation/succession	**Severe reduction in hydrologic connectivity between off-channel, wetland, floodplain, and riparian areas; wetland extent drastically reduced, and riparian vegetation/success altered significantly**
Flow/Hydrology			
Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of similar size, geology, and geography	**Some evidence of altered peak flow, base flow, and/or flow timing relative to an undisturbed watershed of similar size, geology, and geography**	Pronounced changes in peak flow, base flow, and/or timing relative to an undisturbed watershed of similar size, geology, and geography

Indicators	Properly Functioning	At Risk	Not Properly Functioning
Increase in Drainage Network	Zero or minimum increases in drainage network density due to roads	Moderate increases in drainage network density due to roads (e.g., 5%)	**Significant increases in drainage network density due to roads (e.g., 20 – 25%)**
Watershed Condition			
Road Density & Location	< 2 mi/miP2P; no valley bottom roads	**2 – 3 mi/miP2P; some valley bottom roads**	> 3 mi/miP2P; many valley bottom roads
Disturbance History	< 15% ECA (entire watershed) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or riparian areas	**< 15% ECA (entire watershed) but disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian areas**	> 15% ECA (entire watershed) and disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian areas
Riparian Management Areas	The riparian reserve system provides adequate shade, large woody debris recruitment, and habitat protection and connectivity in all subwatersheds, and buffers or includes known refugia for sensitive aquatic species (>80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition > 50%	Moderate loss of connectivity or function (shade, LWD recruitment, etc.) of riparian reserve system, or incomplete protection of habitats and refugia for sensitive aquatic species (~ 70 – 80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition 25 – 50% or better	**Riparian reserve system is fragmented, poorly connected, or provides inadequate protection of habitats and refugia for sensitive aquatic species (< 70% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/ composition < 25%**
Note: **Bold** text in table cells indicates current status of the indicator			

4.4 JOHN DAY RIVER BASIN WATER QUALITY RESTORATION PLAN

The federal Clean Water Act requires that water quality standards be developed to protect beneficial uses and a list be developed of water quality impaired streams (303d list). Water quality standards are based on life stages of fish and the most restrictive need sets the standard.

The Forest Service's responsibilities under the Clean Water Act are described in a 2014 Memorandum of Understanding (MOU) between the Oregon Department of Environmental Quality and the Pacific Northwest Region of the USDA Forest Service. The MOU directs that the "Forest Service manage water-quality-limited water bodies on US Forest Service- administered lands to protect and restore water quality. Management will involve development and implementation of strategies such as BMPs to protect and restore water quality conditions when US Forest Service actions affect or have the potential to affect the 303(d) listed waters" (US Forest Service, 2014). The MOU also directs the US Forest Service to develop a Water Quality Restoration Plan (WQRP) for the John Day Basin Total Maximum Daily Loads (TMDLs) and conduct BMP effectiveness and implementation monitoring. The WQRP was completed in 2014 (USDA 2014) and addresses how grazing actions can remain consistent with the Clean Water Act (CWA), as they are designed to protect and restore water quality as addressed in the WQRP.

Table 16. Streams in action area added to Oregon's 303(d) list after the 2010 TMDL

Watershed (USGS 4th Field Name)	Water Body (Stream/Lake)	River Miles	Parameter	Season	Beneficial Uses	Status	Assessment Action	Supporting Data	Previous Status	Previous Action
Upper John Day	East Fork Beech Creek	0 to 12.4	Biological Criteria	Year Around	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed	Cat 5: Water quality limited, 303(d) list, TMDL needed	Status modification - EPA addition to 303(d) list	EPA addition to 303(d) list 12/14/2012: LASAR 35811 River Mile 4.53 FROM 6/26/2000 To 6/27/2001 1 out of 2 (50%) samples outside WCCP regional criteria.	Previous Status: Cat 3C: Impairing pollutant unknown

5 STATUS OF THE MCR STEELHEAD AND DESIGNATED CRITICAL HABITAT

5.1 DETERMINING PRESENCE OF SPECIES OR HABITATS

The following sources of information have been reviewed to determine if Threatened, Endangered, or Sensitive species and their associated habitats may or may not occur within the project planning area. In the few places where there was discrepancy, the greater distribution was used:

1. MNF GIS database (MNF fish distribution information was updated in 2012 to incorporate Oregon Department of Fish and Wildlife Streamnet information)
2. Regional Forester's (R6) special status species list (7/2015)
3. Oregon Department of Fish and Wildlife (ODFW) stream/fish survey reports
4. Forest Service stream survey reports, Blue Mountain Ranger District, John Day, OR

MCR steelhead and designated CH are documented to occur within the Beech Creek On/Off Allotment in East Fork Beech Creek and a tiny portion of Bear Creek.

5.2 MIDDLE COLUMBIA RIVER STEELHEAD RECOVERY PLAN

The MCR Steelhead DPS was listed by NMFS as Threatened under the Federal ESA on March 25, 1999 (64 FR 15417). NMFS reaffirmed its threatened status on January 5, 2006 (71 FR 834). Protective regulations for MCR Steelhead were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42423). The NMFS revised the 4(d) protective regulations on June 28, 2005 (70 FR 37160).

The MCR Steelhead DPS includes all naturally-spawned populations of steelhead in streams within the Columbia River basin from above the Wind River in Washington and the Hood River in Oregon (exclusive), upstream to, and including, the Yakima River in Washington, excluding steelhead from the Snake River basin (64 FR 14517; March 25, 1999). The major tributaries occupied by this DPS are the Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima River systems. The John Day River (JDR) probably represents the largest naturally spawning, native stock of steelhead in the region. The MCR Steelhead DPS does not include co-occurring resident forms of *O. mykiss* (rainbow trout).

The MCR Steelhead ESA Recovery Plan (NMFS 2009) identified population limiting factors. Tributary limiting factors for the Upper Fork John Day population include degraded channel structure and complexity (habitat quantity and diversity), degraded riparian areas and large woody debris recruitment, altered sediment routing, water temperatures, and altered hydrology.

For the John Day River the primary tributary limiting factors for steelhead are degraded floodplain and channel structure, degraded channel structure and complexity, altered hydrology and sediment routing, water temperature, degraded riparian communities, and impaired fish passage. Habitat limiting factors identified in NMFS (2009) for a Major Spawning Area in the Upper John Day River are displayed in Table 17. Major spawning areas have enough habitat to support 500 spawning adults.

Table 17. Habitat limiting factors for Upper JDR Beech Creek Major Spawning Area identified in NMFS (2009).

Limiting Factor	Beech Creek Major Spawning Area
Degraded floodplain connectivity and function	X
Degraded channel structure and complexity	Lower reaches next to Highway 395
Altered hydrology	Lower reach of McClellan Creek
Altered sediment routing	X
Water Temperature	X
Degraded riparian communities	X
Man-made block to migration	
Impaired fish passage	X

5.2.1 Population Status

Mid-Columbia River steelhead runs in the John Day River Basin are composed of entirely native stocks. However, hatchery fish do stray into the John Day Basin from the Columbia River (CBMRC&D 2005). The Upper John Day River Subbasin contributes approximately 15 percent of the total run for the basin. Spawner abundance in recent years has been moderately variable, the most recent 10-year geomean number of natural-origin spawners was 524 (572 total spawners). Steelhead occupy approximately 410 miles of habitat on the Malheur National Forest. Mid-Columbia River steelhead are widely distributed in the Upper John Day River Subbasin. Spawning and rearing takes place in all major tributaries of the Upper John Day River and within the allotment.

In the NMFS Mid-Columbia steelhead status review (NMFS 2011) the Middle Fork John Day River summer steelhead in the action area were documented with declining escapement compared to the previous (2006) status review. Natural abundance of steelhead in the Middle Fork John Day River group was in a maintained status, but also assessed as lower than the other John Day River population groups (North, South, Lower and Upper mainstem). The Middle Fork John Day River steelhead population continues to be of concern with regard to habitat degradation, especially water quality, water quantity, and riparian conditions. The impacts of both roads and grazing on federal lands continues to be of high concern for the additional significant negative effects of grazing (NMFS 2011). A more recent status review (NMFS 2016) did not add any additional information on areas of concern.

5.2.2 Distribution and Habitat

Mid-Columbia River (MCR) steelhead are widely distributed in the Upper John Day River Subbasin. Spawning and rearing takes place in all major tributaries of the Middle Fork. MCR steelhead utilize the John Day River for migration, as well as spawning and juvenile rearing habitat during years when water conditions are favorable. Spawning and juvenile rearing habitat are present in the following Beech Creek Allotment streams: E.F. Beech Creek and Thompson Creek.

5.2.3 ODFW Redd Survey Data

Courtesy of ODFW (Steph Charette, personal communication) older data from Beech and East Fork Beech creek index surveys were shared with the MNF (Figure 1Figure 5). In 2015, 25 redds were counted and in 2016, 11 redds were counted, which is below the 5-year average of 5.2 redds total per year. More recent data were not available. It would appear the two streams tracked each other closely in any many, but not all, years.

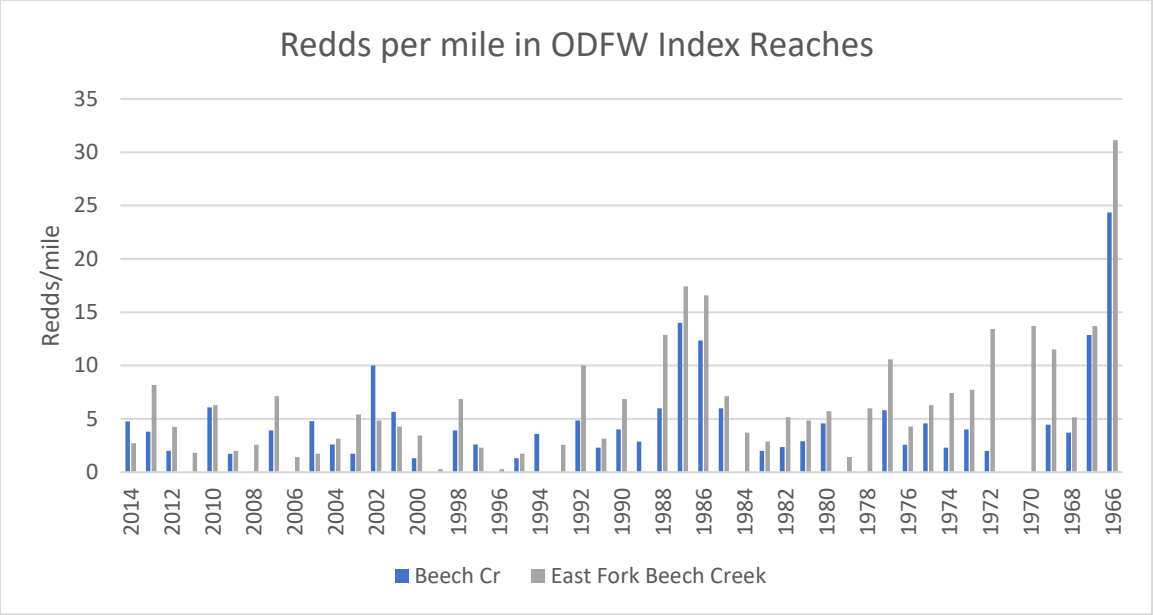

Figure 5. Steelhead redd counts in Beech and East Fork Beech Creek 1966-2014

5.2.4 2022 Five Year Status Review

In 2022, the National Marine Fisheries Services conducted a 5-year review for Middle Columbia River Steelhead. This review stated that John Day River MPG, of which this allotment is a part of, is still not viable. The 2022 review states "The John Day River MPG does not meet the viability criteria of the Lower Mainstem John Day River, North Fork John Day River, and either the Middle Fork John Day River or Upper Mainstem John Day populations achieving viable status (low risk), with one highly viable (very low risk) population since both the John Day Lower Mainstem and the John Day Upper Mainstem populations remain at a 'maintained' status (low risk)."

Key habitat concerns listed in the review related to grazing management include high stream temperatures, degraded floodplain connectivity and function, degraded channel structure and complexity, and degraded riparian communities. Several protective measures to address these issues have been implemented by land managers since the last review. These include riparian grazing fencing, riparian planting, large wood addition projects, channel restoration, beaver dam analogs, and side channel creation. See the 2022 Species Status Review for a complete description of these projects.

The 2022 review recommends continuing efforts to reduce summer temperature, increase summer baseflow connectivity, throughout the John Day basin. The plan also specifically mentions reducing the effects of grazing in the Middle Fork John Day basin to improve floodplain and riparian function, and channel structure.

5.3 CRITICAL HABITAT

Critical habitat (CH) was designated for MCR steelhead on February 16, 2000 (65 FR 7764) that encompassed the major Columbia River tributaries known to support the Distinct Population Segment, including the Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima Rivers, as well as the Columbia River and estuary.

In late 2000, a lawsuit was filed challenging the NMFS February 2000 final designation of CH for ESUs/DPSs of Pacific salmon and steelhead listed under the ESA. A federal court ruled that the agency did not adequately consider the economic impacts of the CH designations. In April 2002, NMFS withdrew its 2000 CH designations.

Critical habitat for MCR steelhead was designated again on September 2, 2005 (70 FR 52630). Designated CH includes the stream channels within the designated stream reaches, and includes a lateral extent as defined by the ordinary high-water line (33 CFR 319.11). In areas where ordinary high-water line has not been defined, the lateral extent is defined by the bankfull elevation. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain and is reached at a discharge which generally has a flood recurrence interval of 1 to 2 years on the annual flood series.

The physical or biological features (PBFs) that are essential for the conservation of listed DPSs on the MNF are those sites and habitat components that support one or more life stages. For MCR steelhead these include:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.

2. Freshwater rearing sites with:
    a. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility.
    b. Water quality and forage supporting juvenile development; and
    c. Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

3. Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

6 ALLOTMENT DESCRIPTIONS/PROPOSED ACTIONS

6.1 PROPOSED ACTION - COMMON TO ALL MNF ALLOTMENTS

BACKGROUND

This section of the 2022-2027 Biological Assessments submitted for the final grazing Biological Assessments (BAs) on the Malheur National Forest (MNF) is intended to be a concise summary for permittees, National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (FWS) – (collectively "the Services"), and MNF personnel which documents the expectations of administering the grazing program to be in compliance with United States Department of Agriculture policy and regulation, and with the Endangered Species Act (ESA). The basis of the content is Forest Service Handbook and Manual direction, and experience acquired from the previous consultation of 2012-2016 and 2018-2022. This section provides expectations for necessary and required communications and is the basis for a common understanding of commitments that are required as part of completing ESA consultation for the next period of grazing 2023-2027.

Livestock pasture rotations are provided in each Biological Assessment under the allotment specific proposed action. The number of livestock and season of use are based on permitted numbers and designated season of use. Numbers, kind (e.g., cattle vs. sheep), class of livestock (e.g., cow/calf vs. yearling), and the period of use are stated on the permit. The numbers permitted, the period of use, or both can be modified by the line officer for resource conditions or emergency action. When the numbers or period of use are reduced for resource conditions, the permittee shall get as much notice as possible, but not less than six months (FSH2209.13). Any modifications to increase numbers, lengthen season of use, or change class of livestock will require meeting the Endangered Species Act, which could trigger re-initiation of consultation. Reports or other pertinent records on range conditions will be made available for review by the permittees, so they are fully informed prior to making any adjustments or having a permit modified.

The MNF uses three types of grazing systems, deferred rotation, season long, and rotation, with most systems falling under deferred rotation or rotation. A few allotments have season long grazing (Lower Middle Fork Allotment, two herds in Fox Allotment, and one herd in the Mt. Vernon Allotment). Rest rotation, with rest of pastures that are not small riparian pastures, is implemented for the Ott Allotment on Prairie City Ranger District (PCRD). On Blue Mountain Ranger District (BMRD) the North Middle Fork Allotment has a rest rotation of Mosquito Riparian and the C pastures every other year (out of 21 pastures total), a rest rotation of four Camp Creek riparian pastures every other year (out of 16 pastures total) on the Long Creek Allotment, a rest rotation of three riparian pastures every other year (out of nine pastures total) on Slide Creek Allotment, and rest for two of five years on the Lower Butte pasture (once created) in the South Middle Fork Allotment.

1) Deferred grazing – The deferment of grazing in a nonsystematic rotation with other land units (SRM 1998).
2) Deferred rotation grazing – Any grazing system which provides for a systematic rotation of the deferment among pastures (SRM 1998). A deferred grazing system provides a systematic rotation of pastures in which grazing is delayed or discontinued to provide for plant reproduction, establishment or restoration of existing plants.
3) Season long grazing –Grazing continuously for the period allowed on the permit such as mid-June to end of October.
4) Rotation – As used on the MNF this is a grazing system where animals are moved from one grazing unit to another in the same order each year. Move times vary if move and/or end triggers have been reached.
5) Rest rotation – A grazing management scheme in which rest periods for individual pastures, paddocks, or grazing units, generally for the full growing season, are incorporated into a grazing rotation (SRM 1998).

In some instances, the BMRD/PCRD graze a pasture twice in the same growing season (i.e. the pasture is grazed both first and last during a single grazing season). This method is used in holding, trailing, and/or gathering pastures, where the pasture holds livestock for a short duration at the start of the season and holds livestock in that same pasture for a short duration at the end of the season. The proposed action in each BA describes how each pasture is to be used.

All allotments subject to this consultation, except for Long Creek and Slide Creek, which are managed under a grazing agreement according to the laws of the State of Oregon, and Blue Mountain Allotment, are permitted by "Term Grazing" permits. The Blue Mountain Allotment is currently not under permit and could be used with a temporary (one year) grazing permit for existing permittees who are taking non-use for resource protection or to provide forage in the case of wildfire on their allotments. Some permits are Term Permits with on/off provisions, such as York and Beech Creek allotments. On/Off occurs when a minor portion of the carrying capacity, usually

less than 1/3, of a logical grazing area is composed of National Forest System (NFS) lands. The intent with on/off pastures is to promote efficient use of intermingled ownership, while at the same time achieving desired conditions on NFS lands.

Livestock are moved throughout the allotments and pastures based on monitoring of forage use in both uplands and riparian areas. ESA consultation is based on move trigger monitoring that is used to start the movement of livestock prior to exceedances and on end of grazing use monitoring in riparian areas that measures: stubble height, woody browse, and bank alteration using the Multiple Indicator Monitoring (MIM) protocol (MIM TR 2011) at Designated Monitoring Areas (DMA).

All DMAs will be consistently documented by the beginning of the 2023 grazing season as spatial data with GPS, photos, and monuments or markers. Move trigger monitoring will occur at the established DMA areas where the three ESA end-of grazing use indicators (stubble height, bank alteration, and woody browse utilization) are also measured. In documented cases there may be only one or two indicators at a DMA that are suitable for monitoring due to stream or riparian condition. The DMAs are established in the areas most sensitive to management influences in each grazed pasture containing critical habitat, which are accessible by livestock. DMAs are not to be temporarily or seasonally fenced, as monitoring the DMAs is intended to be representative of livestock use in riparian areas and critical habitat.

In the previous consultations, measurement of the three MIM indicators was required on any pasture where it appeared that riparian conditions were approaching one or more of the move triggers. The MNF will continue to document the date of move trigger observation and will continue the focus on measurement and documentation of data for any move-triggers approaching their threshold, along with at least four site photos. The MIM data sheets with photos will be electronically filed to the range file and provided to the Ranger District Aquatics (hydrology and fisheries) departments.

The MNF measures end-point indicators within DMAs to assure: 1) Potential adverse effects to listed fish species and their designated critical habitat (CH) are avoided or minimized, 2) Riparian Habitat Conservation Areas (RHCAs) are recovering at a near natural rate to meet Malheur National Forest Land and Resource Management Plan (LRMP) Standards and Guidelines, which include consistency with Middle Columbia River (MCR) steelhead recovery and/or Columbia River (CR) bull trout recovery objectives. In cases where end-point indicators are not met, the line officer will implement adaptive management strategies or actions (Table 20) for the following year to protect and recover MCR steelhead and/or CR bull trout and their CH. Adaptive management actions are necessary to ensure riparian conditions not only meet Forest Plan Standards, but also meet PACFISH/INFISH (USDA FS and USDI BLM 1995/USDA FS 1995a) direction to not retard the attainment of Riparian Management Objectives (RMOs).

Proper pasture and allotment management begins in the spring. If grazing is started too early plant vigor is reduced, total forage production is lowered, ecological conditions are potentially degraded, and RHCAs could receive excessive damage due to livestock use during wet spring conditions. **Range readiness** is the methodology of assessing springtime conditions before livestock turnout. Readiness is primarily based on the development stage of the most common or key plant species in that pasture, moisture of the soils in RHCAs and associated floodplains. A range readiness form (R6-2210-2) is provided as Appendix H of the Biological Assessments and is to be used if readiness is not determined with ocular inspections. If ocular inspection is used it will be documented on an Allotment Inspection Report form to the permit file. Range readiness forms will also be placed in the allotment permit files. The completed forms are not required on every allotment but will be used for all pastures where grazing starts prior to June 1 or where conditions may not be ready for grazing, such as determining if allotments or pastures are ready to graze after fires, floods, or severe drought.

6.1.1 WINTER MEETINGS WITH PERMITTEES

For cases where non-compliance with the terms of the grazing permit was documented and follow-up is necessary, a meeting with the permittee will occur between November and January each year. Potential changes will be discussed to help the MNF and the permittees document agreed upon remedies. The remedies will be documented for review and discussion at the spring meetings and included in Annual Operating Instructions (AOIs). Changes of management activities for purposes of addressing non-compliance and/or resource protection concerns will be conveyed to the Services through Level 1 Team discussions (USDA FS, USDC NMFS, USDI BLM, and USDI FWS 1999).

6.1.2 SPRING MEETINGS WITH PERMITTEES AND ANNUAL CHECKLIST

After the completion of the Final End of Year (EOY) report to the Services on April 15 each year, meetings with permittees will occur between the end of February and end of April to review the previous grazing year and to establish the information needed for documenting the Annual Operating Instructions. An annual check list will be used and documented in the range administration file to review the appropriate topics. Key topics to be reviewed and discussed with documented notes include:

- Confirmation of prior year's actual use (to be reported to and documented by the Range Specialist by November 15 prior to spring meetings for all pastures in allotments with listed fish)
- Evaluate the effectiveness and results of the previous year's pasture use timing and rotation
- Discussion and identification of a proposed rotation by date and livestock numbers by pasture
- Assess the previous year water development conditions and maintenance
- Review and identify water developments proposed for maintenance in the upcoming year
- Evaluate and document other maintenance needed, including fences, results of fence inspections and identified maintenance completed the previous year(s)
- Assess exclosures within the allotment and identify who is responsible for them (MNF or permittee)
- Review and document new project proposals from the permittee
- Review any proposed MNF activities such as prescribed fire, stream restoration, or vegetation treatments proposed to improve or restore habitat in riparian areas in pastures with CH in order to minimize conflicts between prescribed fire, stream restoration, vegetation treatment, and grazing activities. Concentrated cattle use in restoration areas is to be avoided for one to three years after project implementation. Evaluation of the cattle use will be documented with photos for at least two site specific visits in the same year as the project, and up to two succeeding years. If the project area includes a DMA, then mid-season and end of grazing use MIM will be implemented and documented. If any impacts to riparian habitat are identified the cause of the impact (e.g. heavy equipment, fire, or cattle or elk) will be identified. Cattle use must be adjusted where additional impacts from grazing would retard attainment of the RMOs.
- Review and evaluate compliance monitoring results from the past grazing season, including success and problem areas/issues in riparian and sensitive wetland areas or exclosures

- Document any adjustments from the prior year agreed to for upcoming implementation
- If drought conditions exist or are likely, review the Drought Plan and potential modifications to the current year grazing's plan.

See below for checklist.

Annual Spring Permittee Meeting Checklist

Allotment/Permit Information

Allotment Name:_____ Permit Number:_____

Permittee Name:_____ Date:_____

Name of meeting participants:

_____ RMS:_____

_____ AMP? (Y/N) _____

Actual Use - Due 11/15

☐ Attach Tally Record (actual use from previous grazing season)

☐ Previous year's grazing system (what worked, what didn't work, exceedances/violations)

☐ Monitoring results:

1. Permittee involvement
2. ESA compliance
3. Forest Plan Standard/PACFISH/INFISH/Amendment 29 compliance

Range Improvements

☐ Improvement

1. Water developments maintained
2. Water developments proposed for maintenance (water development maintenance plan)
3. Fence issues (fence maintenance plan
4. Dirt tanks/pond maintenance
5. Other projects requiring maintenance
6. New proposed projects (with timeline/plan)

☐ Does Permittee have a map of all assigned range improvements

☐ Does Permittee have a map of all assigned exclosures

TERMS AND CONDITIONS

☐ Grazing permit/Biological Opinion (BO)

1. End of grazing use standards
2. Move Triggers

Proposed Grazing System (Planning)

☐ Proposed grazing system/rotation by pasture and dates

☐ Proposed Forest Service land management activities within the allotment (Rx fires, thinning, stream restoration)

☐ Proper placement of salt and supplements

General

☐ Any changes to permitted base property?

☐ Brand certificates up to date?

☐ Brand certificates match Term Grazing Permit Application?

☐ Ear tag colors used

Other

☐ Other

1. Noxious weeds
2. Drought plan review (if needed)
3. Wildland fire activity (impacts or readiness documentation) review (if needed)
4. Any unauthorized use or excess use on allotment, if yes explain

Signatures

_____ Date _____

Grazing Permittee(s)

_____Date _____

Rangeland Management Specialist

_____Date _____

District Ranger

6.1.3 MONITORING – PROPOSED ACTION COMMON TO ALL ALLOTMENTS

Intensive monitoring at the allotment or local scale is critical to determine if desired conditions are being achieved and adverse effects to ESA listed fish and CH are avoided or minimized. A successful grazing program requires implementation monitoring (e.g., are the actions described in the AOIs, the ESA consultation, and the permit being implemented) and effectiveness monitoring (are management actions effective at achieving the desired conditions).

Effectiveness monitoring specific to the MNF's grazing of riparian communities is limited. The MNF has a total of 204 PACFISH/INFISH Biological Opinion (PIBO) sites, of which 72 are Integrator sites (located lower in a watershed to reflect all upstream management), 67 are DMA sites (occur within grazed watersheds), and 65 are Contract sites (requested specifically by the MNF and monitored for grazing management, wild and scenic river management, and compliance with water quality standards). While the PIBO program has helped provide status and trend data for larger scale analysis areas, such as the Upper John Day or Middle Fork John Day 8-digit Hydrologic Unit Code (HUC) "subbasin", there must be a sufficient number of sites on the landscape with repeat visits to evaluate trends at smaller scales such as allotments. Allotments are often comprised of one to seven smaller 12-digit HUC "sub-watersheds". The PIBO program sites are monitored every five years, unless they are coincident with a grazing DMA established for ESA monitoring which occurs every year. The location of the PIBO sites have gaps in coverage for many MNF sub-watersheds, and together with the five-year repeat visit cycle, precludes assessment of trend in most allotments. Presently condition and trend data are lacking to adequately address effectiveness of allotment management on the longer-term ecological conditions of the MNF riparian communities. Effectiveness monitoring is further addressed below.

The MNF proposes as part of the 2023-2027 consultation to improve implementation monitoring and continue collecting data to assess the effectiveness of grazing management to address allotments subject to ESA consultation. The intent is to move forward with quantification of current and potential ecological condition of riparian areas during this consultation. Except for sites with more than three PIBO data collections (e.g. a site collection every five years over the 15 years since the PIBO program inception), long term trend indicators are limited on the MNF. This has caused continued focus on the three short term annual ESA end point indicators (browse, stubble height, and streambank alteration). The three indicators are used as move triggers during the grazing period and as end of grazing use metrics. They are assigned to each pasture with CH and continue to be the core of implementation compliance for ESA consultation. The overall monitoring program and the objectives of each monitoring type are displayed in the table below.

Table 18. Proposed Monitoring by Pasture with Critical Habitat 2023-2027.

Time of Year	Monitoring Type	Time of Monitoring	Objective	Alternative A Outcome	Alternative B Outcome
Pre-Season (in pastures with sensitive riparian areas that are grazed in May or early June) OR for allotments with wild horses.	Range readiness documented on FS form as an inspection for the file. Evaluation of end point indicators for pastures that overlap the Wild Horse Joint Management Area prior to livestock turnout.	Prior to turnout of livestock.	To determine plant developmental stage and soil condition for grazing use. To determine horse and/or wildlife use in the Wild Horse JMA pastures with unfenced Critical Habitat.	A pasture or allotment is not ready for use and livestock turnout will be delayed. If horse or wildlife use has exceeded endpoint indicators cattle will not turn out.	Livestock can turnout
Mid-Season	Photo documentation and MIM for the three indicators where one or more triggers appear close.	Middle of period for livestock grazing for that pasture or when triggers appear close.	To initiate livestock movement or pasture rotation if needed to avoid exceeding End of Use standards.	If move triggers are close or met start move to next pasture in rotation.	Remain in pasture or more time is allowed based on permit and AOI and riparian/range condition
End of Use	MIM - Endpoint indicators and photo documentation (with possible expansion of indicators).	1-2 weeks after livestock leave the pasture. Within 1 week is optimal.	To ensure meeting Forest Plan standards, guidelines, and ESA Terms and Conditions to minimize take on listed species.	If indicators are exceeded see the Compliance Strategy section and the FS Range Handbook.	Indicators are met and documented, along with actual use. Actual use reporting due November 15.
Trend Monitoring	MIM – 10 indicators and/or PIBO (where available) and photo documentation.	Every 3-5 years following a MNF schedule.	To establish a trend in riparian and aquatic habitat conditions. The first reading provides a baseline to compare to desired conditions.	Downward (or static in some cases) trend due to grazing results in livestock management adjustments.	Upward trend meets Forest Plan standards and objectives, and is compatible with grazing.
Spawning	Redd surveys for summer steelhead (April into June) and bull trout (September into October). Increased attention to variable time of monitoring based on previous year's numbers and current year hydrograph	Prior to grazing a pasture during spawning season period or in coordination with ODFW or tribes to gain additional knowledge on importance of a stream for spawning. .	To document the presence of redds and potential for livestock interaction (which could result in take) and avoid exceedance of take or the need to re-initiate consultation.	Redds are documented, permittees are notified and provided a location map. Redd protection measures are required.	No redds are documented. A decision is made if grazing will be delayed or occur.

The Move Trigger and Endpoint Indicator table below describes the indicators for this consultation. All riparian areas, regardless of grazing period use, will require a six-inch stubble height. When pastures contain Most Sensitive Riparian Areas (MSRA), the streambank alteration move trigger and end of grazing use indicator is adjusted, as in the previous consultation period. In MSRA-designated pastures, the streambank alteration move trigger is 10% and the endpoint indicator is 15%.

Table 19. Move triggers and endpoint indicators assigned to each pasture.

Grazing Use Period	Browse Trigger (%)	Browse Endpoint (%)	Greenline Stubble Trigger (in)	Greenline Stubble Endpoint (in)	Streambank Alteration Trigger (%) MSRA	Streambank Alteration Endpoint (%) MSRA	Streambank Alteration Trigger (%) NO MSRA	Streambank Alteration Endpoint (%) NO MSRA
Early Season	40	50	7	6	10%	15%	15%	20%
Mid to late Season	30	40	7	6	10%	15%	15%	20%

* A 21-40% use, with a 30% midpoint, is classed as "light" use. A 41-60% use, with a midpoint of 50% is classed as "moderate."

In general, ***early season,*** or spring season encompasses the period from the end of supplemental feeding for livestock to seed ripe and includes the time during which soil moisture levels are at their highest due to snow melt and spring rain. Time frame: Early May to early/mid-July

Mid-season includes the hotter part of the summer during which upland forage has dried, seed ripening has occurred, and soil moisture content in the riparian areas have declined. Time Frame: early/mid-July to mid/late September.

Late season grazing is defined as grazing that generally begins after sugar storage in woody vegetation is complete, leaf fall has started, upland plant seeds have shattered, and mean air temperatures begin to cool. Time frame: mid/late September to November.

The exact dates which these periods encompass depend on geography, topography, weather and range conditions. Plant phenology and soil moisture are the dominant criteria.

Move Triggers and Endpoint Indicators

Move triggers and corresponding end-point indicators are implemented in consideration of allotment and pasture conditions and are based on season of use and/or site-specific condition of the resource. Livestock are to be moved as soon as any one of the move triggers is reached or if condition of the indicator (even if not yet at the move trigger) indicates a trajectory of conditions that may exceed the endpoint standards based on specific experience and local knowledge of the permittee or the rangeland management specialist.

Pastures containing MCR steelhead CH and/or Columbia River bull trout CH will be checked near the mid-point of the grazing period in that pasture, conducting and documenting a MIM for move triggers as a trigger is approached or there is an appearance of exceedance. As part of the overall grazing administration, MNF staff may also visually inspect riparian areas for livestock use above CH where there is the potential for downstream effects to CH. Move triggers are designed to ensure that endpoint indicators are not exceeded. The relationship between move triggers, end of grazing use indicators, and the protection of MCR steelhead or CR bull trout and their CH is based on timely monitoring, knowledge of the site (e.g. Rosgen (1996) channel type, seral status or

ecological condition of riparian plant communities, seasonal conditions, and water year), and current best available science. Appropriately moving cattle based on move trigger assessment to not exceed the end of grazing use indicators is intended to maintain desired riparian and aquatic habitat conditions or result in an upward trend toward the desired conditions. The trend in riparian and aquatic habitat conditions will be determined by the photo points and effectiveness monitoring described below. Where the habitat conditions are not at the desired condition, an upward trend in condition will be assumed to be consistent with allowing for a "near natural" rate of recovery.

Permittees are responsible for moving all cattle out of a pasture prior to exceedance of end point indicators and are responsible for ensuring that end-point indicators are not exceeded. As stated in the previous consultation, *move triggers are to be monitored by permittees and MNF staff. The Forest Service is responsible for visual inspections of riparian livestock use in each pasture with steelhead (or bull trout critical) habitat near the mid-point of the grazing rotation for that pasture. The MNF will conduct applicable MIM on any such pasture if it appears that riparian conditions are approaching one or more move triggers or end-point indicators*. Permittees are invited to conduct as well as participate in inspections and other monitoring efforts.

Under this strategy two implementation monitoring components will be implemented on each pasture with CH to evaluate annual livestock grazing management: 1) Move trigger monitoring, and 2) End of use endpoint indicators. A third component of the monitoring is effectiveness (also referred to as "trend") monitoring at selected PIBO and MIM DMA sites. The schedule for the trend monitoring is based on a 3–5-year rotation of individual sites as was established to assess PACFISH/INFISH implementation over the long-term. All three components allow for the evaluation of livestock grazing management. Monitoring will be conducted by a MNF ID Team or a separate monitoring team when available. The PIBO sites on the MNF are monitored by the national PIBO team on a five-year rotation schedule, which incorporates the 65 contract sites added by the MNF to the original PIBO site locations.

DMAs have been established in most pastures containing MCR steelhead CH or CR bull trout CH in the last five years (see DMA Master List in Appendices). The DMAs are in the areas most sensitive to management influences in each grazed pasture containing critical habitat, which are accessible by livestock. The DMA sites are to be monitored by the Ranger District IDT or Forest monitoring team with all personnel trained specifically in MIM techniques and familiar with the requirements for ESA compliance data collection. DMAs represent the impacts of grazing and are intended to be accessible by cows and are not intended to be fenced out. If they are fenced out, alternate actively grazed sensitive sites will be monitored and the spatial location documented along with photo points. Where riparian fencing excludes Critical Habitat, DMA's may not be required.

A DMA will be established by a District ID Team prior to the 2023 grazing season in any pastures containing MCR steelhead or bull trout CH that currently do not have a DMA established, using the MIM Technical Reference 1737-23 (2011) for 'how to establish a DMA'. A photo of the DMA and identifying landscape features (e.g., local hill slope profile, major trees, or boulders) with an upstream and downstream view will be taken each year. Monitoring guidelines and general procedures from the MIM Technical Reference will be followed when conducting MIM monitoring, for example: *"If the site does not have the potential for woody species with appropriate management, do not include the woody species age class and use data as part of the monitoring of the site"* (MIM TR, 2011). An exception to the MIM protocol will occur when the sample reach is too short, but the indicators and grazing use otherwise meet ESA monitoring needs.

The DMA sites are required in each pasture accessed by livestock, including in pastures where the MNF maintains that topography or vegetation preclude cattle use of the riparian are, unless there is physical evidence such as collected by game cameras for an entire season with no cattle observations. The DMAs are established in the

areas most sensitive to management influences in each grazed pasture containing critical habitat. Monitoring is the existing tool that helps determine annual cause and effect of grazing on ESA listed fishes and habitat. Implementation monitoring of the three ESA move triggers and end-point indicators described below will be completed each grazing season in pastures with CH. The end point indicators will be monitored when livestock move off the pasture (one-two weeks following livestock use). By conducting monitoring during this time, it helps determine the cause-and-effect relationships between livestock grazing and stream-riparian conditions and whether livestock grazing management changes may be needed the following year.

Stubble height. Stubble height is a measure of the residual height of key herbaceous vegetation species remaining after grazing. (MIM TR 2011, pp. 23 - 27).

Streambank alteration. Streambank alteration helps determine if grazing intensity is excessive. (MIM TR 2011, pp. 27 - 34).

Woody browse use. Important for determining the success of a grazing management prescription and may help establish the relationship between the level of grazing use by cattle, elk, and other large herbivores. (MIM TR 2011, pp. 34-39)

6.1.4 Effectiveness Monitoring

Effectiveness monitoring to identify longer term trends in condition will be conducted at 3-to-5-year intervals. Trend monitoring consists of the MIM protocol which includes 10 indicators, seven of those specific to long-term trend monitoring, in addition to the three short-term "implementation" indicators (browse use, stubble height, streambank alteration). These additional indicators are also useful for monitoring stream condition changes that occur as a result of management activities in addition to livestock grazing.

6.1.4.1 Ecological Condition of Riparian Areas

The Malheur National Forest would like to develop an ecological classification system of the Forest's stream and riparian areas. It is anticipated that this will provide a framework to better describe existing versus desired conditions for a variety of valley types and vegetation communities that comprise MNF riparian areas. The goal is to have an improved riparian ecological classification system that better assists resource management including grazing management. This framework will rely on existing information such as the Mid-Montane Wetland Plant Associations of the Malheur, Umatilla, and Wallowa-Whitman National Forests (Crowe and Clausnitzer 1997) and additional information such as stream valley classifications. The Malheur National Forest will collect vegetation data over the next five years to determine riparian condition and seral status which will inform the development of an ecological classification system as resources allow.

Additional monitoring variables will continue to be incorporated by the agreement of the Level 1 and Level 2 team members. These additional variables will continue to help identify the ecological baseline condition of riparian areas, which is important when assessing how departed the riparian condition may be from ecological potential or from a desired condition. They will also further explain the conditions captured by photo monitoring. Of high priority to supplement the analysis of grazing's impacts on aquatic/riparian systems are these indicators which would be measured on a 3–5-year rotation:

Woody species age class. The procedure is designed to provide decision makers with information concerning the recruitment of woody species along streams. For systems with the potential to produce woody vegetation the

procedure helps provide an understanding of whether the woody species are increasing, decreasing, or maintaining numbers and age classes. (MIM TR 2011, pp. 51-54)

Greenline composition. The composition of vegetation along the greenline directly effects the condition of streambanks and the overall stream condition. The major plant species along the greenline are helpful for analyzing the effects of livestock grazing along a stream. Streambanks dominated by deep rooted vegetation result in stable streambanks, narrow channel widths, shading, habitat diversity, and terrestrial insect production. (MIM TR 2011, pp. 39-44)

Greenline to greenline width. Many stream channels become overwidened as a result of vegetative changes and physical disturbance to streambanks from improper livestock grazing (i.e., streambank trampling and shearing) or other physical disturbances to the streambanks. As streams recover they become narrower. (MIM TR 2011, pp. 54-57)

The information collected during the MIM trend monitoring, and the work the MNF hydrologist is coordinating with the PIBO program to develop an analysis of greenline ecological vegetation conditions will allow the MNF to evaluate and track the current conditions in relation to desired vegetation conditions. The ecological seral status recommendations in the "Enclosure B" (USDA FS 1995b) guidelines for each National Forest covered by PACFISH were intended to help adjust grazing prescriptions in a more informed manner and to determine progress toward meeting and maintaining long term desired trends and recovering riparian and aquatic habitat.

Long term trend monitoring will continue to be conducted by a MNF ID Team (defined as at least one fisheries biologist or hydrologist with a rangeland specialist or botanist, with preference for both a fisheries biologist and a hydrologist). A qualified technician from either program may be substituted on the team. An independent (and appropriately trained) monitoring team may also conduct the effectiveness monitoring, if available.

The additional seven indicators are (including the three above that may be collected during ecological condition monitoring):

Greenline composition (adopted from Winward 2000 and USDI, BLM 1996a). The "greenline as defined by Winward (2000) is the "first perennial vegetation that forms a lineal grouping of community types on or near the water's edge. (MIM Technical Reference (TR) 2011, pp. 13-19).

Woody species height class (Kershner et al, 2004). Woody species regeneration occurs within a six-foot wide belt adjacent to the greenline on both streambanks (MIM TR 2011, pp. 44-47).

Streambank stability and cover (Kershner et al, 2004). (MIM TR 2011, pp. 47-51).

Woody species age class (Winward 2000). (MIM TR 2011, pp 51-54).

Greenline-to-greenline width (GGW) (Burton et al. 2008). GGW is the nonvegetated distance between the greenlines on each side of the stream. It provides an indication of the width of the channel, reflecting the disturbance of the streambank and vegetation (MIM TR 2011 pp.54-58).

Substrate (Bunte and Abt 2001). Sampling of bed material is used to determine the effects of channel disturbance (MIM TR 2011 pp. 58-63).

Residual pool depth and pool frequency (Lisle 1987). Residual depth is the average of all differences between riffle crest depth and the pool max depth in the survey. Pool frequency is a count of all pools encountered divided by the thalweg (max) length of the DMA (MIM TR 2011, pp 64-47).

6.1.5 Spawning Surveys

MCR steelhead spawning surveys must occur within all pastures containing CH where turnout is expected prior to July 1 or where the stream is not permanently fenced off from livestock use. **Bull trout spawning surveys** must occur within all pasture containing CH where grazing will occur after August 15. Where there is risk of redd trampling, **the MNF staff and permittees** will utilize a number of tools or management options to protect redds and avoid trampling. These include but are not limited to: alternative rotation, rest, exclusion fence, temporary electric fences, and additional riding. Avoidance in time and location of the spawning area by livestock, or exclusion fencing, are most effective, with additional riding and temporary electric fencing often being less than 100% effective.

When redds have been documented to occur within a pasture, MNF staff will communicate the location of the redds to the permittee within 24 hours and provide a location map no later than 72 hours. If grazing is not already occurring yet planned prior to July 1 (MCR steelhead) or after August 15 (CR bull trout), direction to the permittee to eliminate interaction between livestock use and redds in that pasture will be documented within 72 hours. Redd protection measures can be decided upon through discussion and communication with the permittees, but must involve the Ranger District Fisheries Biologist, the Forest Fish Biologist, or the Forest Consultation Biologist. Implementation of the redd protection measures, whether fencing, movement of livestock off the pasture, or other effective and agreed upon method, including a combination of methods, will be reviewed in the field and communicated to the services within 24 hours after notifying the permittee that redds have been located in a pasture with grazing. Because the effectiveness of redd protection measures varies, the MNF will annually review the measures taken for the purposes of eliminating those (on a pasture basis). Failure in one year will trigger adaptive management the following year in that specific pasture to avoid interaction with redds. Specific permanent exclusion fencing that is part of the 2023-2027 proposed actions to protect stream reaches with redds are described in detail in the allotment and pasture descriptions where it is occurring.

6.1.6 ADAPTIVE MANAGEMENT

As noted above, monitoring is a key aspect of adaptive management. Move trigger monitoring needs to be conducted in addition to end of actual use monitoring. End of use monitoring occurs promptly following livestock pasture off dates to observe if the current grazing management is meeting standards or if any of the listed adaptive management strategies need to be implemented. Monitoring is the responsibility of the MNF, with participation from the permittees encouraged.

An adaptive management strategy is appropriate in dynamic situations, such as livestock grazing. Adaptive management is designed to provide the MNF the ability to make annual livestock grazing management decisions based on new information, changing ground conditions, or the result of any of the monitoring discussed above. Adaptive management is intended to ensure: 1) Forest Plan standards and guidelines are being met, 2) sites not at desired conditions have an upward trend, toward attainment of RMO's, and 3) ESA consultation direction with the Services are met.

When mid-season trigger data and/or annual end of grazing use data is collected and shows a need for change in livestock management, the MNF will implement management adjustments (e.g. livestock numbers, timing, duration of grazing, and/or rest). Making adjustments to ensure that end of grazing use indicators are not

exceeded is intended to result in positive effects to habitat indicators and therefore to CH in the long-term. Such adjustments should also have beneficial effects to the species, as many adaptive management adjustments will reduce the time that livestock are in or adjacent to streams and RHCA's.

Under the proposed action, the MNF and permittees will jointly implement needed adaptive management options for the management of livestock grazing on an allotment (Table 20). The goal of implementing the management strategy components will be to achieve and maintain sustainable grazing systems on the allotment, while allowing riparian conditions to move in the direction of meeting desired conditions and RMO's at a **near natural rate of recovery**. The objective is to have grazing management more proactive, generating long-term solutions to recurrent problems rather than reactive responses to immediate crises. Success will be gauged in the short term as meeting annual use indicators and in the long term to allow for sites not in a desired condition to have an upward trend and to meet requirements for aquatic resources directed by the MNF LRMP.

Table 20. Adaptive Management Options

Possible Grazing Management Actions	
A	Implement a different grazing system within grazing permit dates, and/or change number of pastures. As example, options include deferred rotation in 2, 3, 4, or more pastures, rest-rotation, or short-duration spring grazing to meet resource objectives on the allotment (may include use of permittees private land in the rotation).
B*	Modify annual grazing use indicators or add other indicators as needed to facilitate achievement of objectives and desired conditions.
C*	Construct new permanent water development to influence livestock distribution (wells and pipelines, and use of solar pumps).
D	Remove existing water development to influence livestock distribution.
E	Construct fence to exclude livestock from areas of concern (springs, seeps, riparian, ESA critical habitat, Region 6 sensitive species sites, species of local concern, hardwoods, heritage site, or other).
F	Implement specific dates of use or nonuse to protect areas of concern.
G*	Construct permanent fence to influence livestock distribution.
H	Use temporary electric fence for short-term control of livestock distribution.
I*	Remove (permanent or temporary) fence to influence livestock distribution.
J	Use of range rider (herding) to control livestock movement (distribution).
K	Change class of livestock (i.e., cow/calf to yearling)—do not exceed permitted animal unit months or stocking rate.
L	Rest from livestock grazing for one or more seasons.
M	Change the permitted livestock number, permitted animal unit months and/or season of use until monitoring or inventory data shows endpoint indicators can be met. .
N	Do not allow livestock grazing in a pasture or allotment.
O*	Change allotment or pasture boundaries.
P	Use salt or other supplements to draw livestock toward or away from specific areas.
Q	Move existing water developments, if feasible, away from streams and springs.
R*	Fell and jackstraw trees to reduce livestock impacts to areas of concern.
S	Harden water gaps or stream crossings, and/or stock pond berms.
T	Restrict access and/or use until after June 30 avoid MCR Steelhead spawning or after August 15 to avoid bull trout spawning and to reduce impacts to Critical Habitat.
U	Expand monitoring for spawning and rearing to better document use of stream reaches, whether designated critical habitat or not.

*If these are used, may require new NEPA decision or re-initiation of Section 7 Consultation.

If adaptive management changes are needed those changes must be documented in the AOIs for that permit, shared with the Level 1 team, and reported in the Annual End of Year report. Changes may involve any of the items listed above in Table 20**Error! Reference source not found.**. Changes that are outside of permit terms and conditions may require a documented agreement or permit modification and concurrence by the line officer. Needs for other structural or non-structural range improvements or for site-rehabilitation efforts may be identified and will require an IDT review and District Ranger decision or may require additional NEPA review and/or ESA consultation.

6.1.7 FENCE MAINTENANCE

As part of the grazing permit and associated ESA proposed action, Livestock Grazing Permittees are responsible for maintenance of perimeter allotment fences, interior pasture fences, and for all exclosure fences which are primarily intended to protect critical habitat, springs, and riparian areas from grazing and are related to grazing management. The MNF will be responsible for maintenance of exclosure fences established for aspen, recreation,

wildlife, or other uses not related to livestock grazing management. All fences are to be assessed, and repairs made where necessary before turnout (including fences that are the responsibility of the Forest Service).

Documentation of existing fences and maintenance responsibilities are identified in the grazing permit Part 3. As new livestock management fences are constructed, Term Grazing Permit modifications will assign maintenance responsibility to Livestock Grazing Permittee(s). Existing fences, if not already assigned maintenance responsibility, will be assigned to the appropriate permittee(s) within two years through Term Grazing Permit modifications. All Term Grazing Permit modifications will follow Forest Service Handbook Direction, and be tracked and updated electronically (e.g., the digital grazing map and corporate database), along with hard copies as appropriate in the range file.

Permittees shall notify District Range Staff of completed pre-season and in-season fence inspections and maintenance. Notifications to District Range Staff may be made by documented phone calls, emails, texts, notes, or other forms of documentation. Completed maintenance will be documented by range staff in allotment files along with any MNF inspection results. All fences must be maintained to established specification(s) prior to turn-out in a pasture/allotment and for each subsequent pasture used throughout the grazing season. In the event that a neighboring allotment and/or pasture is grazed prior to turn-out of a permittee, the permittee who has maintenance responsibilities of the boundary fences is required to make necessary repairs prior to the neighbor's turn-out.

Where maintenance issues occur during the grazing season and are outside the control of the Permittees (for example wildlife damage or wildfire), District Range Staff shall be notified. A cooperative plan of action to remedy the maintenance issue will be mutually agreed upon by the Permittee, District Range staff, and other staff as needed (e.g. fisheries, wildlife or recreation), approved by the District Ranger, and shall then be remedied as soon as possible. The remedy action will be documented to the range file. If there is minor wildlife damage the fence will be repaired by MNF range staff or by the permittee as soon as identified and not require a plan. If the maintenance issue is caused by wildfire then it may not be remedied until the next year or a later year prior to grazing resuming on the allotment or pasture.

Fences near the end of their useful life will be discussed routinely at spring permittee meetings and put on a schedule for re-construction. New construction and re-construction are to be documented in the corporate database for range activities (currently INFRA) in the same year as completed and documented in the AOIs. Maps showing newly constructed fences will be provided by the MNF to the Level 1 Team.

Failure to comply with the above conditions shall constitute Fence Maintenance Non-Compliance. A Fence Maintenance Non-Compliance letter will be prepared and sent to the Permittee and to the Services at the time of issue, as well as copied in the Year End Report. Corrective action to remedy the Fence Maintenance Non-Compliance shall be completed as soon as possible, but in no more than seven (7) days (unless a longer time period has been agreed upon and documented between the permittee, the rangeland management specialist, and the line officer). Shorter critical sections of fence protecting an actively grazed pasture must be fixed within 72 hours or less.

If the Fence Maintenance Non-Compliance is not remedied within that timeframe, livestock would be required to be removed from the pasture, or no livestock grazing will be authorized to start grazing in the pasture where non-compliance exists. If the fence maintenance is for a substantial portion of fence that requires more than 7 days to comply or if livestock are already in the pasture/allotment where the Fence Maintenance Non-Compliance exists; they will be promptly gathered and rotated to the next pasture with properly maintained fences in the grazing rotation. If the pasture/allotment where the Fence Maintenance Non-Compliance exists is the last pasture

in the grazing rotation, livestock will be promptly removed from the allotment. Failure to remedy Fence Maintenance Non-Compliance within the seven (7) day timeline (unless as stated above a longer time period has been agreed upon and documented between the permittee, the rangeland management specialist, and the line officer) may have additional impacts to other Terms and Conditions for grazing use within the allotment.

If Fence Maintenance Non-Compliance occurs in more than two grazing seasons during the five year consultation period, the pasture/allotment where the non-compliance occurred may be rested and re-initiation of consultation with the Services will be completed prior authorizing grazing. The Services, Permittees, District Ranger and Range/Aquatics staff will be included in the discussion of how the non-compliance shall be remedied. All permit violations and non-compliance issues will follow the guidance in the Grazing Permit Administration Handbook (FSH 2209.13).

6.1.8 COMPLIANCE STRATEGY FOR THE STREAMBANK ALTERATION ENDPOINT INDICATOR 2023-2027

As stated above an ESA monitoring (MIM) DMA will be established by a District ID Team prior to the 2023 grazing season in any pastures containing MCR steelhead or bull trout CH that currently do not have a DMA established, using the MIM Technical Reference 1737-23 (2011) for 'how to establish a DMA'. A photo of the DMA and identifying landscape features (e.g., local hill slope profile, major trees, or boulders) with an upstream and downstream view will be taken each year from a consistent GPS point or a fixed monument.

Bank alteration move triggers are established and used to indicate the need to move livestock to avoid exceedances of the indicator. Livestock will begin moving to the next pasture (or off the allotment when they are in the last pasture in the rotation) when the move trigger for bank alteration or stubble height is reached. For each pasture where the level of streambank alteration exceeds the standards as stated below, the line officer and ID Teams shall identify, incorporate, and document adaptive management strategies into the following season's grazing strategy which may include adjustments to: livestock numbers, timing of grazing, duration of grazing, or rest.

1. Measured bank alteration up to 6% over the endpoint indicator (at end of use) of 15% for CH with MSRA, 20% for CH only (16 - 21% for CH/MSRA and 20 - 26% for CH): The permittee will be contacted within 24 hours or sooner via phone or in person to notify them of the monitoring results. A letter of non-compliance will be sent to the permittee requiring a remedy of the situation within the following year. The letter will include the corrective action to demonstrate compliance (e.g., to what standard), the timeframe of remedial action, and consequences for failure to comply (FSH 2209.13). A copy of the non-compliance letter will also be sent to the Services (NMFS and USFWS) and be included as an appendix in the annual EOY report.

    a. If the above occurs a second time during the life of the BO (does not have to be consecutive years), the District Ranger may initiate suspension or cancellation of part of the permit, including a reduction in the days of use for the allotment the next year, or the number of livestock permitted and/or complete rest of the specific pasture for one year, or a combination of those options. The previous letter of non-compliance shall be the basis of action remedies to repeated incidences of non-compliance. The suspension or cancellation remedy shall be documented in a letter that will also be sent to the Services and included as an appendix in the annual EOY report.

2. When streambank alteration is measured more than 6% over the endpoint indicator (at end of use) of 15% for CH with MSRA, 20% for CH only (21% for CH/MSRA and 26% for CH): The permittee will be contacted within 24 hours or sooner via phone or in person to notify them of the monitoring results. A letter of non-compliance will be sent to the permittee and will include the corrective action to demonstrate compliance (e.g., to what standard), the timeframe of remedial action, and consequences for failure to comply (FSH 2209.13). A copy of the non-compliance letter will also be sent to the Services (NMFS and USFWS) as well as be included in the annual EOY report. Corrective action may include one or more of the following: 1) a reduction in the days of use for the allotment the next year, 2) reduction of the number of livestock permitted or 3) complete rest of the specific pasture for at least one year. The AUM/HMSs will be reduced from the total numbers authorized in the year the exceedance occurred, and implemented the following grazing year.

    a. If exceedance (non-compliance) from number 2 above occurs two (2) years of five in any pasture within an allotment (does not have to be consecutive years) or if the exceedance occurs in multiple pastures in one year on an allotment, the District Ranger may initiate suspension or cancellation that includes a three year reduction in the days of use for the allotment, or the number of livestock permitted and/or complete rest of the specific pasture(s), or a combination of those options. The three-year time frame will be applied regardless of what year in the Biological Opinion (BO) these non-compliances occur. If non-use occurs towards the end of the 2023-2027 BO, the pasture rest and allotment Animal Unit Month (AUM/HMS) reduction will continue into the new consultation. The original letter of non-compliance regarding alteration in excess of 6% over the endpoint indicator shall be the basis of corrective action for repeated incidences of similar non-compliance. The suspension or cancellation remedy shall be documented in a letter that will also be sent to the Services and included as an appendix in the annual EOY report.

3. If there are multiple exceedances in an allotment in any given year, depending on the severity of 1-6% or over 6%, see number one or two above. If violations persist, partial to total cancellation is appropriate (FSH 2209.13).

6.1.9 COMPLIANCE STRATEGY FOR THE STUBBLE HEIGHT ENDPOINT INDICATOR 2023-2027

Stubble height move triggers are established and used to indicate the need to move livestock to avoid exceedances of the indicator. Livestock will begin moving to the next pasture (or off the allotment when they are in the last pasture in the rotation) when the move trigger for stubble height or bank alteration is reached. For each level of stubble height exceedance in the 2023-2027 consultation, the line officer and Interdisciplinary (ID) Teams shall identify, incorporate, and document adaptive management strategies into the following season's grazing strategy which may include: adjustments to: livestock numbers, timing of grazing, duration of grazing, or rest.

1. Measured stubble height under the endpoint indicator (end of use) of six inches at one or more monitoring locations on an allotment in one year: The permittee will be promptly contacted via phone or in person to notify them of the monitoring results. A letter of non-compliance will be sent to the permittee with one year to remedy the situation and will include the corrective action to demonstrate compliance to six inches, the timeframe of remedial action, and consequences for failure to comply (FSH 2209.13). A copy of the non-compliance letter will be sent to the Services and included as an appendix in the annual EOY report.

a. If the above occurs a second time in a location previously exceeded in an allotment during the life of the BO (does not have to be consecutive years), the District Ranger may initiate suspension or cancellation of part of the permit, including a reduction in the days of use for the allotment the next year, or the number of livestock permitted and/or complete rest of the specific pasture for one year, or a combination of those options. At a minimum the corrective action will include less numbers and a reduction in days of use for the allotment. The AUM/HMSs will be reduced from the total numbers authorized in the year the exceedance occurred. The previous letter of non-compliance shall be the basis of action remedies to repeated incidences of non-compliance. The suspension or cancellation remedy shall be documented in a letter that will also be sent to the Services and included as an appendix in the annual EOY report. A copy of the letter will be sent to the Services at the same time as the permittee and included as an appendix in the annual EOY report.

2. If exceedance (non-compliance) from number 1 above occurs two or more years (does not have to be consecutive) on an allotment, the District Ranger may initiate suspension or cancellation, in whole or in part, of the permit, including a reduction in the days of use for the allotment the next three years regardless of what year in the BO this occurs. The corrective action will include a reduction in the number of livestock permitted and/or complete rest of specific pastures for three years, or a combination of those options. At a minimum the corrective action will include less numbers and a reduction in days of use for the allotment. The AUM/HMSs will be reduced from the total numbers authorized in the most recent year the exceedance(s) occurred. If, non-use occurs towards the end of the current BO, the pasture rest and allotment AUM/HMS reduction will continue into the new consultation.

If a combination of stubble height, bank alteration indicator exceedances, or lack of fence maintenance occurs in an allotment, the permit violations are not considered minor. A letter of non-compliance will be issued with the specific actions required of the permittee to remedy the non-compliance, the timeframe for the action, and the consequences of the failure to comply. Recurring non-compliance of more than one indicator in time (more than one in five years) or space (multiple pastures in one allotment) or continued documented lack of fence maintenance shall lead to suspension or cancellation in part or whole of the Term Grazing Permit. Permit action involving the suspension or cancelation of grazing permits would be carried out as per direction outlined in FSH 2209.13 and 36 CFR 222.4.

7 EXCESS USE

Excess Use is defined as any livestock owned by the holder of a National Forest System grazing permit but grazing on National Forest System lands in greater numbers, at times, or in places other than permitted in Part 1 of the grazing permit or authorized on the annual Bill for Collection, including any modifications made by the authorized officer. Failure to remove livestock at the end of the authorized grazing season or when instructed by the authorized officer is also defined as excess use.

If excess grazing use occurs within any exclosure, pasture, or allotment containing critical habitat, the Permittee will be promptly notified and given 72 hours to remedy the situation. While 72 hours is the Forest Service Handbook guideline for the Notice of Non-Compliance and Opportunity to Remedy excess use (FSH 2209.13 Chapter 10 Section 16.2e). A second occurrence of excess use may result in a 25% or more suspension of permitted numbers or seasons for a period of at least two years.

For any case of excess use the District Ranger or their representative will be notified. District Range and Fishery staff will then conduct a field inspection to document the excess grazing use through ocular observations, photos

and if warranted MIM endpoint indicators. The excess grazing use will be resolved if field inspections show no exceedances of any ESA required MIM indicators (stubble height, woody browse, stream bank alteration), and the Permittee remedies the situation within 72 hours. Documentation of the excess grazing use and the inspection report would then be placed in the Range Allotment File and included in the End of Year report.

If field inspections show the potential for exceedance of any one of the three ESA required indicators (stubble height, woody browse, and stream bank alteration) the three indicators will be measured according to the MIM Technical Reference. Additional MIM indicators may also be collected (e.g., woody species age class). The results of the indicator monitoring, photos, and documented Permittee communication will be sent to the Services within 72 hours. All inspection reports should be provided to the Permittee in a timely manner (FSH 2009.13, Section 19.4). Documentation will also be included in the End of Year report.

If the excess grazing use is not resolved by the Permittee within 72 hours, or if the issue is a repeated or cumulative offense; formal administrative action will be taken following FS Handbook direction. Formal action includes providing the permittee with clear, documented explanation in a Notice of Non-Compliance (NONC) letter. The NONC letter shall specify the action required to remedy the non-compliance, the timeframe to comply, and the consequences for failure to comply. The permittee will have an opportunity to correct the situation and bring their permit back into compliance in the same year. If the original non-compliance occurs a second time, or if the non-compliance has not been remedied as specified, the Permittee will receive a notice of permit action for non-compliance. Formal action could include suspension of a portion of permitted numbers or a reduction in the grazing season for a minimum of one year. The MNF will document when compliance has been achieved (see FSH 2209.13). Documentation would be put into the Range Allotment File and included in the End of the Year report.

Severe cases may result in following the Forest Service Handbook guidelines at Section 16.2d, which expressly states that an exception to written notice of non-compliance and opportunity for remedy may be reasonable based on violations of permit terms and conditions that adversely impact species listed under the ESA or their critical habitat.

7.1.1 KEY COMMUNICATION BETWEEN THE MNF AND THE PERMITTEES

The Forest Service Handbook 2209.13 Chapter 10, section 19 directs General Administration of Grazing Permits. Documentation of allotment inspections and monitoring shall be done electronically using the format in the Forest Service corporate database. Permittees must be notified in person or by telephone of any items needing immediate attention. The inspection notes are filed in the official 2230 permit folder with copies sent to the permittees. The documentation serves as a basis for discussions with permittees regarding corrective actions to ensure compliance, completion of annual reporting, development of AOIs for the next grazing season, and documenting permittees contributions to management success.

The direction states that Forest Plan standards, including those pertaining to livestock grazing and fisheries or riparian habitat, will be the basis of monitoring and administering Part 3 of the grazing permit. Permittees are responsible for meeting the terms and conditions of the grazing permit and moving livestock to ensure compliance with management guidelines. Agency personnel are responsible for ensuring permittees comply with grazing permit terms and conditions and performing monitoring to determine if objectives are being met. Compliance determinations should be documented electronically on appropriate inspections forms and in letters to the permittee. Where Forest Plan standards were not met, the authorized officer should identify corrective actions that will result in improved management in the next grazing season. A determination of compliance will not be

made if an allotment did not receive a physical inspection by a technically qualified agency employee during or after the grazing season.

After almost twenty years of ESA consultation for livestock grazing's effects on steelhead and bull trout on the MNF, each period of renewed ESA consultation has built upon previous experience of both agency staff and permittees, including a Situation Assessment by the National Riparian Service Team in 2009 and many years of litigation over grazing impacts. The results of administration of the previous ten years (2012-2022), together with review of the Biological Assessments submitted to the NMFS and the U.S. FWS, are placing a renewed emphasis on prompt and clear lines of communication for certain actions and information sharing and documentation.

The emphasis includes documenting the context for actions related to grazing management as appropriate, for example when did the action occur (date), where did it occur (Ranger District, allotment, pasture, and stream), why did it occur, what will be done as a result of the action (remedy, corrective action, or path forward), and how is the occurrence and remedy documented. The actions of concern are in regard to pastures with critical habitat or the documented presence (seasonal or otherwise) by listed fishes, and specifically include:

- **Cows in pastures past off dates** (see Excess Use section above)
- **Infrastructure maintenance and updates (GPS, maps, additions)** – the annual list produced at the spring grazing meetings with the permittees will serve as the documentation of annual infrastructure maintenance and updates. The Forest's Range Specialist is responsible for keeping records of the location of range improvements in the permittees file, and is responsible for updating information into the INFRA database as pertains to infrastructure updates, such as fences. When poorly maintained infrastructure is documented by non-range personnel the information will be documented in an e-mail provided to the range specialist.
- **Unauthorized grazing** are those animals not authorized by a permit (e.g. private land cows that have wandered onto Forest land and the owner is not a permittee). If cows are not promptly identified and removed by the owner, then unauthorized grazing is most commonly addressed as a law enforcement issue.
- **Move triggers monitored** – monitoring results will be documented within five working days and available in internally shared electronic file folders. Where move trigger or mid-season monitoring indicates that move triggers are hit or are being exceeded, the permittee is notified in person or by phone within 24 hours. The follow up documentation of the communication is on an Allotment Inspection form and scanned or electronically filled out and filed in the allotment file and shared with the permittee.
- **Overgrazing and exceedances outside of CH/MSRA/or PIBO/MIM DMAs –** exceedances in either uplands or outside of critical habitat which are severe could be considered as failure to follow management instructions and would follow the 72 hours of notice to notify the permittee of non-compliance. Exceedances would be documented by the district range staff, although initial notes, photos, or locations may be documented by non-range staff in an e-mail to the range staff. It is the responsibility of the range staff to determine if Forest Plan standards are not being implemented and to work with permittees either informally or formally, depending on the violation and corrective actions identified for follow up.
- **Concentrated use resulting in adverse impacts to riparian restoration projects, including cattle use where riparian regrowth or hardwood re-establishment is occurring** – annual meetings with the permittees will review any restoration implementation that will occur within an allotment in the upcoming year including prescribed fire, stream or floodplain restoration, riparian plantings, or riparian thinning to establish hardwoods. The discussion will be documented and the remedy to

avoid impacts to restoration investments will be identified in the meeting notes and the annual AOI letter. Remedies may include temporary (1-3 years) exclusion by fencing, rest of a pasture for a season, modification of timing of grazing, or other solutions proposed by the permittee or the Ranger District ID team.

- **Vandalism on pasture infrastructure (gates open, fences removed, salt blocks moved, hunters' salt areas)** – Reoccurring problems or unauthorized actions which result in resource impacts will be documented by either the permittee, the Forest's range staff, or other MNF personnel (who will report the problem to the range staff). MNF personnel must document the issue to the range staff or District Ranger with a photo and a description of the location within 48 hours of finding a problem. Both the project or action and the remedy will be documented by the range staff for notification of the permittee and inclusion in the EOY report.
- **Redd locations and protection** – If there is no grazing in a pasture with CH and spawning activity, then redd surveys are not necessary. The critical applicable dates are avoiding grazing before July 1st for steelhead spawning streams and after August 15th for bull trout spawning streams. If grazing is planned, then redd surveys in CH will occur and will be documented before grazing occurs in that pasture. Permittees will be notified with a phone call or e-mail, and a map within 48 hours of documenting redds. The protection strategy for the redds will be agreed upon and documented by the Ranger District fisheries staff in cooperation with the rangeland management specialist, and the documentation will be provided to the permittee and to the MNF ESA Consultation Biologist or Forest Fisheries Biologist within a week of documenting the redds. The information will be included in the EOY report provided to NMFS and USFWS. If redd protection measures are observed to be ineffective see Redd trampling below.
- **Redd trampling** – Redd trampling will be documented by photos, a location description by GPS. The permittee will be notified promptly, no more than 24 hours after locating the redds. If the redds are trampled, NMFS and/or USFWS will be notified within 24 hours of the trampling being identified. Cattle will be removed from the pasture immediately, but not to exceed 24 hours after redd trampling documentation. This action will cause re-initiation of consultation for that allotment in order to document where it occurred, the extent (number of redds), photographic evidence of cattle use in the immediate area, and when action was taken to remove the cattle. The letter and attachments documenting the trampling and the response will be provided to NMFS and/or USFWS within 72 hours of the trampling being discovered. Copies of re-initiation correspondence will also be sent to the Livestock Grazing Permittee and added to the range permit file.
- **Monitoring crew (schedule, reports, outcome that create letters to permittees)** Monitoring schedules will be shared with permittees starting in June. Adjustments to the monitoring schedules are likely to occur and the monitoring team leader or Ranger District ID Team is responsible for keeping an updated schedule which will be shared with permittees prior to monitoring. Data that indicates whether permit terms and conditions are being met or exceeded will be shared with permittees within 7 working days. If livestock are still in the pasture beyond the authorized date and exceedances exist, the notification for removal will be prompt (no more than 24 hours). The monitoring results and all information in the EOY report will be made available upon request to permittees. PIBO data reports will also be available to permittees upon request and as the PIBO reports become updated or available.
- **Providing** r**anchers an opportunity for instruction or review of monitoring techniques and objectives-** The MNF must provide opportunities for clear understanding by permittees and agency personnel of how Forest Plan compliance is monitored, including specifics that are part of ESA consultation. At least one structured group field day per year focused on monitoring will be offered to permittees with attendance by MNF interdisciplinary staff (fisheries biologists, hydrologists, technical fisheries or watershed personnel, range specialists, and botanists or ecologists). NMFS and

USFWS Level 1 team members will also be invited. Permittees will continue to be notified of routine monitoring inspections to their allotments so that they can participate as time permits.

7.1.2 KEY COMMUNICATION BETWEEN THE MNF AND THE SERVICES

The MNF and the Services use the ESA Level 1 team and the interagency consultation streamlining process for communication around ESA listed species and their designated critical habitat. The Level 1 team is an interagency group of field staff with a variety of expertise and agency responsibility. There are monthly Level 1 office meetings with additional field visits in the summer and early fall. The team can meet on an ad hoc basis if needed for urgent or unforeseen high priority actions, in addition to the reviewing action plans, BAs, and draft BOs. The goal of this process is to produce adequate BAs that will facilitate and expedite issuance of a BO or concurrence letter (1999 Interagency Streamlined Consultation Procedures). However, in October of 2022 National Marine Fisheries Service informed the USFS that streamlining procedures would not apply to this (2023-2027) consultation.

Upon review of the grazing Biological Assessments submitted to the National Marine Fisheries Service and the U.S. Fish and Wildlife Service in June of 2017, and as a result of Level 1 and Level 2 field reviews in 2017, a renewed emphasis on prompt and clear lines of internal and external agency communication, interdisciplinary accountability, and livestock grazing program record keeping was requested. The context for addressing some of the actions includes (as appropriate); what is the identified concern/issue, when did it occur, where did it occur, why did it occur, and what will be done as a result of the action (remedy or path forward), and how will it be documented. The actions of concern for the Services speak to pastures with critical habitat or the documented presence (seasonal or otherwise) by listed fishes. Specific concerns include:

- **Field trips –** As part of the late spring, summer, and early fall Level 1 Team meetings, field trips will allow for visits to allotments and pastures. These visits allow for communication across agencies and increased understanding of range issues, range condition, and the exchange of information. In general Level 1 Team meetings are not considered as open meeting to the general public. Forest Service line officers will be notified of any field trips on their units and may accompany the Level 1 Team. The Level 1 team may also request other specialists to participate, based on their expertise, including rangeland specialists, ecologists, soil scientists, wildlife biologists, or botanists. Permittees may be invited, but are not always expected to participate in the Level 1 field meeting visits.
- **Cows in pastures past off dates** (see Excess Use grazing section above)
- **Infrastructure maintenance** and updates (GPS, maps, additions) – the annual list produced at the spring grazing meetings with the permittees will serve as the documentation of annual infrastructure maintenance and updates. The Forest Service Range Specialist is responsible for keeping records of the location of range improvements in the permittees file and is responsible for updating information into the INFRA database as pertains to infrastructure updates. All assigned infrastructure maintenance responsibilities must be located in the permit file and should be located in the range corporate database.
- **Unauthorized grazing** are those animals not authorized by a permit (e.g. private land cows that have wandered onto Forest land and the owner is not a permittee). If cows are not promptly identified and removed by the owner, then unauthorized grazing is most commonly addressed as a law enforcement issue.
- **Move triggers monitored** to determine if endpoint indicators are on target to be met or if cattle should start moving. All move trigger and endpoint indicator monitoring results will be documented within five working days and available in internally shared electronic file folders. Results will be shared with the services in the Year End Report, and prior to that at Level 1 meetings.

- **Overgrazing and exceedances outside of CH/MSRA/or PIBO/MIM DMAs -** these would be documented by the district range staff, although initial notes, photos, or locations may be documented by non-range staff in an e-mail to the range staff. It is the responsibility of the range staff to determine if Forest Plan standards are not being implemented and to work with permittees either informally or formally, depending on the violation on corrective actions for follow up. If the overgrazing or exceedances outside of CH may affect listed fish or critical habitat the information will be shared with the Services at the next Level 1 meeting.
- **Vandalism on pasture infrastructure (gates open, fences removed, salt blocks moved)** – see above
- **Redd locations and protection –** If there is no grazing in a pasture with CH and spawning activity, then redd surveys are not necessary. The critical applicable dates are avoiding grazing before July 1st for steelhead spawning streams and after August 15th for bull trout spawning streams. If grazing is planned, then redd surveys in CH will occur and will be documented before grazing occurs in that pasture. Permittees will be notified with a phone call or e-mail, and a map within 48 hours of documenting redds. The protection strategy for the redds will be agreed upon and documented by the Ranger District fisheries staff in cooperation with the rangeland management specialist, and the documentation will be provided to the permittee and to the MNF ESA Consultation Biologist or Forest Fisheries Biologist within a week of documenting the redds. The information will be included in the End Year report provided to NMFS and USFWS. If redd protection measures are observed to be ineffective see Redd trampling below.
- **Redd trampling** – Redd trampling will be documented by photos, a location description by GPS. The permittee will be notified promptly, no more than 24 hours after locating the redds. If the redds are trampled, NMFS and/or USFWS will be notified within 24 hours of the trampling being identified. Cattle will be removed from the pasture immediately, but not to exceed 24 hours after redd trampling documentation. This action will cause re-initiation of consultation for that allotment in order to document where it occurred, the extent (number of redds), photographic evidence of cattle use in the immediate area, and when action was taken to remove the cattle. The letter and attachments documenting the trampling and the response will be provided to NMFS and/or USFWS within 72 hours of the trampling being discovered. Copies of re-initiation correspondence will also be sent to the Livestock Grazing Permittee and added to the range permit file.
- **Coordination of forest projects (including proposed vegetation treatments, prescribed fire) with grazing activities in areas that overlap –** the purpose is to understand project components that may affect grazing activities and how planning considers both range and vegetation or fire components. Under this item review of the impact that fires, floods, or other major disturbances have on grazing is also appropriate. Meetings and information exchanged would be documented as Level 1 activities.
- **Monitoring crew (schedule, reports, outcome that create letters to permittees) –** Monitoring schedules for redd surveys and ESA DMA locations will be available to the Services starting in April for the redd surveys and in June for the DMAs. Adjustments to the monitoring schedules are likely to occur and the monitoring team leader or Ranger District ID Team is responsible for keeping an updated schedule, which will be available upon request. Data that indicates whether permit terms and conditions are being met or exceeded will be shared with the Services at monthly Level 1 meetings (or if for redd trampling see timing above). The monitoring results will be compiled in the EOY report. PIBO data reports will also be available to the Services upon request and as the PIBO reports become updated or available.

7.1.3 **Project Design Criteria (PDCs):**

The following PDCs in Table 21 will be used to minimize or eliminate adverse effects of grazing on MCR steelhead, and designated CH. These PDCs are integral components of the proposed action, and it is expected that all proposed grazing activities will be completed consistent with these criteria.

Table 21. Grazing Livestock Project Design Criteria.

#	PROJECT DESIGN CRITERIA (PDCs)
1	Permittees must maintain all assigned perimeter and interior fences (including exclosure fences related to livestock management) prior to turn-out each year. Existing exclosure fences (including those the Forest Service is responsible for) and any future riparian exclosure fences, shall be inspected and maintained each year prior to turnout of livestock. The results of fence inspections shall be reported to the Responsible Official prior to approval of yearly grazing authorization.
2	Herding and trailing of livestock will be at historically used roads or road crossing where available. Areas with saturated soils such as; springs, seep, or meadows shall be avoided.
3	Trailing will be controlled herding of livestock, where permittees actively push livestock to the next pasture.
4	Spawning surveys will occur within all pastures containing critical habitat or documented spawning streams where turnout is expected to occur prior to July 1 for steelhead and after August 15 for bull trout.
5	When redds are located permittees will be notified by the MNF range staff. Maps with redd locations will be provided by the MNF fisheries biologist or range staff prior to livestock turnout on that pasture.
6	When redds are located permittees will be notified by the MNF range staff. Maps with redd locations will be provided by the MNF fisheries biologist or range staff prior to livestock turnout on that pasture. To minimize risk of redd trampling the Forest and permittees will utilize a number of tools to protect redds, which include but are not limited to these options: deferred rotation, rest, exclusion (if water gaps are present their location and size must be reviewed and documented by the District Fish Biologist), temporary electric fences, additional riding, or no grazing in pastures till after July 1 for MCR steelhead and after Aug 15 for bull trout.
7	Complete all required monitoring (implementation and effectiveness) at MIM DMAs. The monitoring will be accomplished by an interdisciplinary team. Photos can augment but not replace MIM DMA monitoring.
8	MNF will complete and document mid-season monitoring and checks of RHCAs for livestock use in each pasture that contains MCR steelhead CH and CR bull trout.
9	Annual end of grazing use indicators will be used along with pastures off dates, spawning seasons, to dictate when livestock are to be moved from pastures.
10	The MNF Range and Aquatic staff will provide NMFS and USFWS with an End of Year Report by February 15 of each year, for the previous grazing season.
11	All existing troughs, springs and ponds to be maintained will be prioritized at spring meetings with permittees. Maintenance is required as part of the term grazing permit. The proper function of these developments is critical for livestock distribution and helps to reduce impacts to stream riparian areas.
12	Use of roads and off-road travel by permittees and Forest Service staff will follow these PDCs: Vehicles are not authorized to travel through seeps, springs, or streams except for use of existing fords or road crossings. All refueling activities and fuel storage will occur at least 150 feet away from live streams. OHV routes within 100 feet of streams will not be visible so that access routes do not become new trails and minimize disturbance to riparian vegetation. OHV travel off established roads within 100 feet of streams would occur only during periods when soil is dry and rutting or compaction is not apparent.

7.2 ALLOTMENT SPECIFIC PROPOSED ACTION

The Beech Creek Allotment is authorized for 35c/c (304AUM's / 230 HMs) from May 15 to November 30 (200 days). This allotment is generally used for approximately 14 weeks or 98 days between May 15 and November 30. The MNF proposes to authorize livestock grazing on the Beech Creek Allotment for the next five years 2023-2027. The Beech Creek Allotment is currently operated by one permittee. Pasture use dates, livestock rotation and livestock numbers are presented in the Pasture Use Table (Table 22).

Table 22. Beech Creek Allotment Permit Information.

Permit Number	Permit Exp. Date	Total Acres	Permitted number of livestock c/c pair/AUMs/HMs1	Permit season begin and end dates	Modifications by date
0604010010	12/31/2023	3750	35/304/230	5/15 to 11/30	2019 removed Fox Allotment from the permit.

Livestock are typically trailed into the pastures of the Beech Creek allotment from the adjacent private land or allotments, which are owned by the permittee. The pastures of this allotment are used by the permittee to facilitate livestock movement from the permittees private land or forest service allotment to a forest allotment or back to private land. Therefore, the proposed action for this allotment includes actions for other allotments that the permittee manages (John Day and Mt. Vernon allotments).

The Beech Creek allotment is different than other allotments in several ways:

a. Not all the pastures of the allotment border each other; some are separated by 12 miles.
b. Given that the pastures do not border one another, livestock do not rotate through them in the traditional manner.
c. The pastures include varying amounts of private land owned by the permittee and managed with the forest service land.
d. The pastures of this allotment are in different watersheds.
e. Only the Beef and Patterson pasture the pastures are adjacent to one another and are used with the grazing rotation of the John Day allotment.

Because of these reasons, the specific rotation is set annually at AOI meetings. Table 24 below describes that use could occur at any time during the permitted season. However, use will NOT be for the entire time. The following is a description of the pastures in this allotment and the timeframes for which they will be used. .

[1] An AUM is calculated as the number of days the cattle are grazing a pasture multiplied by the number of cow/calf (1.32), then divided by 30.4167 (which is the average number of days in a month over a year), and rounded up to the whole AUM). A headmonth (HM) is one cow/calf pair for one month. Because the HM is the official unit of measurement for permitting on USFS lands, this BA is including both AUM and HM numbers. The AUMs and HMs as presented are interchangeable, meaning there is no increase or decrease in the permitted number of livestock on the allotments.

- ***Patterson Pasture:*** *(655 acres;* contains 0.04 miles of steelhead CH and 0.02 miles of MSRA. This pasture will be used for approximately four weeks per year, typically early in the season. Livestock enter the private land portion of this pasture (south of the forest) first in the season, on the permitted "on date." It typically takes two weeks before livestock reach the Forest Service owned portion of this pasture.

  Livestock enter the private land portion of this allotment located to the south of the forest. They are moved north toward the forest where they enter the Beef pasture, after utilizing the Patterson pasture of this allotment.
- ***Beef Pasture:*** *344 acres of Forest Land and approximately 160 acres of Private land;* contains 1.06 miles of steelhead CH and 1.13 miles of MSRA. This pasture will be used for approximately 2 - 4 weeks per year, typically early in the season after June 1st. This pasture includes approximately 160 acres of private land that is owned by the permittee. This pasture has a Forest and PIBO DMA in it located on the East Fork of Beech Creek.

  Livestock enter the private land portion of this allotment located to the south of the forest. They are moved north toward the forest where they enter the Beef pasture, after utilizing the Patterson pasture of this allotment.
- ***Timber Pasture:*** *94 acres of Forest Service land and approximately 750 acres of Private land;* contains 0.0 miles of steelhead CH and 0.0 miles of MSRA. This pasture is used for 2 weeks typically late in the season.
- ***Grouse:*** *1892 acres;* contains 0.0 miles of steelhead CH and 0.0 miles of MSRA. This pasture is used for 3 weeks early in the season for the livestock that are entering the Mt.Vernon allotment. There is a PIBO DMA adjacent to the pasture just outside the allotment fence boundary.

Table 23. Miles of MCR steelhead critical habitat and MSRA by pasture within the Endangered Species Act Action Area.

Pasture Name	Stream Name	Steelhead Critical Habitat	MSRA
Beef	East Fork Beech Creek	1.06	1.13
Patterson	East Fork Beech Creek	0.40	0.22
	Overall Total Miles	**1.46**	**1.35**

Table 24. Pasture use range of dates for the Beech Creek Allotment 2023-2027. Use in each pasture will be limited in duration as described above. Specific timing and rotation will be determined on an annual basis during the spring meeting with the permittee.

Pasture Name livestock numbers	2023	2024	2025	2026	2027	MIM DMA PIBO or Photo Pt
Patterson** (35c/c)	*5/15 - 11/30	*5/15 - 11/30	*5/15 - 11/30	*5/15 - 11/30	*5/15 – 11/30	CH fenced except water gap
Beef ** (35c/c)	*5/15 - 11/30	*5/15 - 11/30	*5/15 - 11/30	*5/15 - 11/30	*5/15 - 11/30	MIM PIBO
Grouse** (35c/c)	5/15 – 11/30	5/15 – 11/30	5/15 – 11/30	5/15 – 11/30	5/15 – 11/30	CH Fenced

Pasture Name livestock numbers	2023	2024	2025	2026	2027	MIM DMA PIBO or Photo Pt
Timber (35c/c))	5/15 - 11/30	5/15 - 11/30	5/15 - 11/30	5/15 - 11/30	5/15 - 11/30	No CH
*Turn-out before July 1 requires completion of MCR steelhead spawning/incubation surveys in critical habitat (Section 6.1.5) **Rotation will be adjusted annually. Pasture length of use is described in text above. Cattle will not be grazing allotment wide for entire season of use, only a maximum of 230 headmonths (as permitted) would be authorized in any year.						

Table 25. Move Triggers and Endpoint Indicators for the Beech Creek Allotment Pastures

Pasture DMA Site Stream Name	Monitoring Attribute	Key Species	Move Trigger	Endpoint Indicator
Beef PIBO DMA (155-02-K) East Fork Beech Creek MSRA – Present	Browse Use		30-40 %	40-50%
	Greenline Stubble	Deep rooted hydric spp. (sedges)	7 inches	6 inches
	Streambank Alt.		10%	15%
RHCAs all pastures Forest Plan Standards	% Utilization	Riparian Grass Species	35%	45%

8 EFFECTS OF THE PROPOSED ACTION

The direct and indirect effects of implementing the action, including interrelated and interdependent actions, on the listed species and designated CH are evaluated in this section. In addition, the probability of directly affecting juveniles, spawning adults, and incubating embryos in redds will be assessed. The environmental impacts of implementing the project elements will be evaluated by use of NMFS MPI indicators to determine effects to ESA-listed MCR steelhead and designated CH.

The proposed actions are expected to allow previously degraded riparian areas/habitat indicators to continue on a trajectory of slow recovery, especially with a six-inch stubble height applied to all riparian areas, not just in MSRA and Critical Habitat. It is anticipated that some of the indicators at the 12-digit HUC or action area scale could improve in status over the five years of this consultation based on implementation of the proposed actions. Active restoration and, in some cases, additional information may be needed to identify changes in grazing management that will improve some indicators, such as temperature or levels of fine sediment.

8.1 GRAZING USE INDICATORS AND SUPPORTING RATIONAL

The three annual end of grazing season use indicators 1) stubble height along the greenline, 2) browse use of current year leaders of woody species along streambanks, and 3) streambank alteration, have been used on the MNF since 2004 and are the result of several factors, including the interim guidelines of PACFISH (USDA FS and USDI BLM 1995) and on analysis and review of scientific information. The three indicators have been slightly modified since their initial use in 2004. However, there is no change to the proposed grazing use indicators for this consultation period from the 2018-2022 consultation period.

Stubble Height – Herbivore grazing and browsing may impact stream and streamside conditions directly through mechanical alteration to streambanks and/or indirectly through altering riparian vegetation (University of Idaho 2004). Stubble height can be used as an annual indicator of livestock grazing use and impacts to riparian areas. The use of stubble height standards should be restricted to "sites near the stream edge, that is, areas that can be described as streamside, or near-stream areas of hydrophilic or potentially hydrophilic vegetation" (Clary and Leininger 2000). At this interface between vegetation and water (the greenline), riparian and stream habitats are most sensitive and dynamic. This is where moist vegetation communities are mostly likely to occur, and where erosive energy of the stream plays a major role. Because hydrophilic vegetation is often rhizomatous, heavy-rooted and tends toward complete continuity of bank cover along the channel margins, it can be very resistant to stream erosion. This resistance lends itself to channel stability and helps to create stream habitat structure and complexity favorable to aquatic organisms. It is here where stubble heights must be measured to reflect the potential effect of grazing on hydrophilic plant vigor and therefore to relate stubble height to channel stability. Because stubble height applies only to herbaceous vegetation, its use applies only where herbaceous vegetation currently controls bank stability.

Goss (2013) found a significant positive relationship between stubble height and streambank stability, the latter being one of the RMO indicators for grazing management under PACFISH and INFISH. Protecting stubble height helps protect streambank stability. A similar result between stubble height and streambank stability was found by Clary (1999) in that grazing to stubble height over a stated level (10 cm at end of late spring grazing season) resulted in no significant change in streambank stability even though there were differences in cattle caused bank alteration.

More specifically, stubble height has been shown to be related to two areas of concern: 1) the effect of grazing on the physiological health of the individual plant, and 2) the ability of the vegetation to provide streambank protection and to filter out and trap sediment from overbank flows. A summary of the literature (Clary and Leininger 2000) also shows how stubble heights can reflect streambank trampling and shrub (willow) browsing on the greenline. Based on limited research, Clary and Leininger (2000) proposed a 10 cm (4 in) residual stubble height as a "starting point for improved riparian grazing management." However, they acknowledged that, in some instances, 7 cm (2.75 in) may provide adequate riparian protection and that in other instances 15 to 20 cm (6 to 8 in) may be required to limit streambank trampling or to reduce willow browsing. Thus the stubble height criteria varies depending upon local environmental variables and the timing, duration and intensity of livestock use. The linkages between stubble height and riparian functions have not been extensively researched nor documented through long-term monitoring. Stubble height as an annual indicator of grazing use in riparian areas should only be used where existing science suggests that it is an appropriate indicator and in combination with long-term monitoring of vegetation and channel parameters.

In aquatic systems, above and below ground biomass as well as stem densities of the riparian vegetative community are a good proxy for channel processes and fish populations (Chadwick 2002, Bayley and Li 2008, Saunders and Fausch 2007, Goss 2013).

In using stubble height as a measure of grazing impacts on streams and riparian areas it is important to understand the processes altered by cattle grazing. If stubble height is used as a surrogate of plant vigor, clipping studies have shown that leaving from 1 cm (Clary 1995, Clary and Kinney 2002) to 10 cm (Clary 1995, Boyd and Svejcar 2012) can reduce future year's aboveground biomass production with the loss of future growth varying across environmental gradients (e.g. elevation and moisture). Clary (1995) found 10 cm or greater stubble height was necessary to maintain future year's growth in a high elevation (1950 m) sedge community while a lower elevation (927 m) redtop community could maintain future growth characteristics at 5 cm stubble height.

Previous studies have been used to set riparian standards to retain 10 cm (4 inches) of stubble height along cattle grazed streams. The 4 inch standard was set for early season grazing in the 2012-2016 consultation. Because of listed fish and the goal to protect and recover their habitat, six inches (15.24 cm) is the proposed action end of grazing use indicator height in all riparian areas for the 2023-2027 consultation. In a study which sought to integrate multiple factors that could be important to fish, early season grazing (late June) that left 10.5 cm of stubble was shown to maintain most stream habitat conditions but 14.1 cm (5.5 inches) was needed to protect all measured stream attributes (Clary 1999). These values represent measurements taken as cattle were removed from the riparian pasture; values for these same pastures recorded at the end of the growing season were 12.9 cm (5.1 inches) and 16.4 cm (6.5 inches) respectively (Clary 1999). In each case over 2 cm of growth occurred between when cattle were removed and when vegetative growth had senesced in the fall. While Clary (1999) focused on the 10.5 cm value, stubble height at the end of the growing season (12.9 cm) better represents conditions that protect stream and riparian attributes from high stream flows that occur during the winter and spring.

A stubble height objective based on a goal to maintain or restore floodplain sediment routing processes requires taller plant heights (≈ 20 cm) to maintain sediment deposits on the streambank (Abt et al. 1994). Clary et al. (1996) found short statured plants (< 2 cm) can settle out stream sediment but that the deposits are not necessarily maintained, which is needed to help recover many of the cobble dominated stream banks on the MNF, which have lost floodplain function over time from various historic impacts.

Few other studies have elucidated the relationship between the end of growing season stubble heights and stream conditions. Goss (2013) found a linear relationship between increasing stubble height and decreasing streambank

angle (good for trout) and increasing residual pool depth (good for trout), streambank stability and percent undercut banks (good for trout). This suggests that across stream and riparian conditions evaluated within the Interior Columbia River Basin, the higher the stubble height the greater the likelihood stream conditions favored by trout would be present (Goss 2013). Similar conclusions from a much smaller scale study were presented by Chadwick (2002) for riparian health and width-to-depth ratios.

An underappreciated value of stubble height, especially in small streams, is its function as overhead cover. Saunders and Fausch (2007) found that while shrubs accounted for most of the overhead cover, certain cattle grazing management strategies (high intensity short duration) could foster conditions where graminoids and forbs provided considerable overhead cover in small streams. The presence of overhead cover can reduce stream temperatures (Li et al. 1994. Bayley and Li. 2008, Nusslé et al. 2015) and increase trout growth during late summer (Saunders and Fausch 2007, Saunders and Fausch 2012). Streamside cover is also important for terrestrial invertebrate inputs for trout forage. Ungrazed areas with greater vegetative cover fostered greater density of cold water fish (rainbow trout) and lower densities of warm water fish than nearby grazed areas in northeastern Oregon (Bayley and Li. 2008).

Stubble heights that are too short alter cattle behavior. Cattle generally switch to consuming more woody material when stubble height is 10 and 15 cm high (Kovalichik and Elmore 1992) with reported values ranging from as 7.5 cm (Hall an Bryant 1995) to 20 cm (Pelster el al. 2004). Pelster et al. (2004) found that during summer and fall grazing greater than 40% of cattle diets were willow when stubble heights were less than 20 cm. Secondarily, as stubble height drops below 10 cm cattle become less efficient feeders (Ungar et al. 1991), so must move more to consume the same amount of forage. This additional cattle movement could increase streambank alteration. This suggests if the goal of a stubble height objective is to protect woody material and reduce streambank disturbance during late summer, stubble heights of 15 cm measured at the end of the grazing season are likely necessary to minimize potential changes in cattle foraging and movement behaviors.

Browse use on non-forested riparian ecosystems has two important areas of concern: (1) loss of woody vegetation that provides shade, cover, and streambanks; and (2) streambanks themselves, often called "the green line," with their protective herbaceous vegetation. Cattle can affect each of these in different ways. Direct browsing of shrubs reduces the cover and shade they provide over the stream and could prevent their regeneration. (Clary and Medin 1990, Clary and Webster 1989, Elmore 1992, Platts 1989).

Because riparian areas differ in terms of their hydrologic and soil characteristics, their vegetation potential differs. For instance, some riparian areas do not support woody vegetation such as cottonwoods and willows, but instead may be dominated by sedges, rushes, and grasses. Other riparian systems support or may have the potential to support woody vegetation.

Stubble height and greenness factors are critical elements in palatability and cause shifts in cattle forage preference, such as changing from grasses and sedges to shrubs or from moist-site grasses and sedges to wet-site course sedges (Clary and Webster 1989, Gillen and others 1985, Hanson 1993, Kauffman and others 1983a). Cattle preference will change as herbaceous vegetation dries (Clary and Webster 1989, Gillen and others 1985, Hanson 1993, Kauffman and others 1983a).

Unacceptable impacts from livestock grazing can be avoided in riparian areas by recognizing that a shift in cattle preference can occur as the 3-inch stubble height is approached. Assume undesirable shrub use will occur at any time as stubble height changes from 3 inches to 3/4 of an inch because of major shifts in livestock preference (Clary and Webster 1989). Drying of herbaceous forage, particularly Kentucky bluegrass, also will cause a shift in preference to woody shrubs that may adversely impact riparian ecosystems.

Streambank alteration – Streambank erosion is a fundamental driver of stream channel form and maintenance in unmanaged systems. Streambank stability is generally characterized by evaluating bank failure rates along a distance of streams and will rarely be 100% stable in any situation. In many managed areas, bank failure rates have natural and anthropogenic components that vary with stream size and slope. Natural stability varies for riparian areas with vegetation ranging from grass to trees (Lyons et al. 2000). Streambank stability of forested systems are often primarily related to the amount of shade, large tree and tree root structures and the size of the substrate on the streambed. In contrast the stability of non-forested zones will have a much stronger relationship with the near stream above and below ground biomass of herbaceous and shrub vegetation. Given this, the expected stability of a stream will depend upon the environmental condition of the existing herbaceous and shrub vegetation.

Compared to natural rates livestock grazing in managed systems can increase stream bank erosion rates and cause negative effects. These effects include increased width to depth ratios, stream incision, loss of undercut banks, loss of pools, loss of effective stream shade, and increased streambed sediment loads. The magnitude of streambank erosion often increases in the areas most sensitive to trampling.

Results from past management activities created stream networks on the MNF where conditions lack instream large wood and greenline late seral herbaceous and woody species. These conditions make it challenging for stream systems to re-establish undercut banks; sediment is flushed through the simplified system, and can embed spawning gravels in lower gradient reaches. These conditions are reflected in over widened dished out streams that limit floodplain interaction and have lowered the ground water tables. PIBO and stream survey data indicate that while conditions in some streams have improved, the current conditions are significantly departed from desired conditions for functioning riparian systems.

Today, many of the MNF most sensitive greenlines are composed of simplified grass communities or non-protective forbs as evidenced by the number of DMA's where stubble height can't be used as an indicator or greenline sample numbers for key species are extremely low. Use of streambanks by livestock within many of these systems on the MNF may cause direct physical damage through the breakdown of the bank and the overuse of the available herbaceous vegetation. This could continue to prohibit a change in vegetation to protective sedges from existing non-protective forbs. Prolonged or concentrated use also fosters streambank erosion and reduces the filtering action of dense sedges, which tends to reduce sediment loading (Clary and Medin 1985, Clary and Webster 1989, Elmore 1992, Platts 1989). In this event, riparian conditions are kept at a static state or move in a downward trend.

Given historic impacts and the current MNF baseline it may take intense management where streamside livestock grazing occurs, to create and maintain a balance where these areas can be grazed, and riparian conditions can move in the direction of desired conditions.

8.2 PROJECT ELEMENTS

The six project elements below are the component parts of the action that the MNF is consulting on. Project elements are assessed in this section of the BA. Some of the project elements involve the use of vehicles on and off roads to access sites, such as four wheel drive trucks and/or OHV's.

1. Livestock use of allotment/pastures. Livestock will utilize the allotment/pastures consistent with the permitted numbers, season of use and grazing system described above for each pasture (section 6) and in the term grazing permit.

2. Permittee management of livestock and infrastructure maintenance. This includes move-in and move-out of cattle, herding, placement of nutrient (salt blocks) in the uplands, and maintenance of troughs, springs, ponds, fences and gates. Use of highway and off-road vehicles is included in this PE.
3. Range improvements. This includes the construction of fences for riparian pastures, pasture boundary fences, and the construction/development of off-stream water sources.
4. Exclusionary fencing. Fences are constructed or placed to exclude areas from grazing. This is done to prevent livestock damage of riparian areas and in the case of electric fencing, to minimize the potential for cattle stepping on redds.
5. Monitoring. A variety of implementation and effectiveness monitoring techniques are employed to determine if desired conditions are being met (see Section 6.1). Monitoring includes use of manual and electronic equipment, including electronic tablets, tape measures, and rulers, to measure vegetation, water quality and stream channel/streambed characteristics.
6. Adaptive management. An adaptive management strategy is designed to provide the MNF the ability to make management decisions based on new information, changing conditions, or the results of implementation/effectiveness monitoring. It will be used to ensure: (1) Sites at desired condition remain in desired condition; (2) sites not in desired condition have an upward trend; and (3) direction from ESA consultation with NMFS is met. The adaptive management strategy describes how adjustments will be made to ensure annual endpoint indicators as well as other direction from this consultation are met. Section 6.1 also describes when and how regulatory agencies will be contacted in the event direction from this ESA consultation is not going to be met. The MNF Adaptive Management Strategy is described in Section 6.1.

The MNF has determined that unauthorized use or livestock trespass is not an action. However, the implementation of MNF enforcement actions regarding unauthorized use and livestock trespass is interrelated and will be discussed in Section 9.1, *Unauthorized Grazing.*

8.3 PROJECT ELEMENTS DROPPED FROM FURTHER ANALYSIS

An initial step in the analysis process is to determine if any of the project elements are already provided ESA coverage in a concluded programmatic consultation. The consultation history section (Section 1.2) described the Aquatic Restoration Biological Opinion (ARBO II). Range improvements are covered under that consultation. Range improvements in the ARBO II Biological Opinion described as: "e.g., exclosure fencing, off-site water developments in the same footprint." Consequently, many actions that are described by project elements 3 and 4 have existing ESA coverage under the Forest-wide Aquatic EA and will not be further evaluated in this BA.

Project element 6, adaptive management, provides a mechanism to adjust management if end-point indicators and desired conditions are not being met. Examples of adaptive management measures are provided in section 6.2 and include reducing livestock numbers, changing the timing and duration of grazing, resting pastures, adjusting the numeric end-point indicators, and constructing more exclusion fences. Adjusting ensure that end-point indicators and desired conditions are met will result in positive effects to habitat indicators and therefore to CH. The results would also have beneficial effects to the species, as many adaptive management adjustments will reduce the time that livestock are in or adjacent to streams.

Law enforcement actions to remove cattle not under permit will result in entirely beneficial effects to the species and designated CH.

Of the six project elements for this consultation, project element 3, 4, and 6 have been addressed above. The remaining project elements: 1) Livestock use of allotments/pastures, 2) Permittee management of livestock and infrastructure maintenance, and 5) Monitoring will be analyzed below.

8.4 PROJECT ELEMENTS ANALYZED

Project Element #1 Livestock Use of Pastures and Allotments – Livestock will graze the individual pastures that make up the allotment in the numbers, time frames, and locations described above in section 6 and in the term grazing permit.

Project Element #2 Permittee Management of Livestock and Infrastructure Maintenance – This project element includes the move-in and move-out of livestock using highway and off-road vehicles and herding by range riders or the permittee on foot. While vehicles are also used to access sites for monitoring purposes (PE 5), the effects of vehicle use to CH and to the species will only be assessed for this project element to reduce redundancy in the analysis. Sideboards for vehicle use are provided by the PDCs described earlier in the proposed action section.

Troughs, springs, and ponds are maintained by grazing permittees to provide off-stream water for livestock. In addition, there are miles of fence and numerous gates that are maintained each year. Typical maintenance activities involve the use of hand tools or machines on a small footprint of land. Some work such as repairing troughs or replacing wire will not involve any soil or vegetation disturbance. Other maintenance activities may disturb small amounts of soil and vegetation, but rarely within riparian areas adjacent to MCR steelhead CH. Workers performing maintenance activities rarely walk in riparian areas or in stream channels where listed fish are present or in designated CH.

Project Element #5 Monitoring - A variety of implementation and effectiveness monitoring techniques are employed to determine if desired conditions are being met. Workers use manual and electronic equipment to measure vegetation, water quality and stream channel/streambed characteristics. Some monitoring actions include wading in stream channels.

8.5 PHYSICAL OR BIOLOGICAL FEATURES (PBF)

The three project elements above will be analyzed for their effects to designated CH and effects to the species. The freshwater physical and biological features (PBFs) of MCR steelhead CH applicable to the action area are presented in **Table 26**.

Table 26. Physical or Biological Features of MCR Steelhead Critical Habitat Applicable to the ESA Action Area.

PBFs	Description
1	Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
2	Freshwater rearing sites with: (i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; (ii) Water quality and forage supporting juvenile development; and (iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
3	Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

Physical and biological features have been determined by NMFS to be essential to the conservation of the species. The effects to each PBF, and ultimately to designated CH as a whole, can be determined by evaluating the effects to indicators of the NMFS Matrix of Pathways and Indicators (MPI) that correspond to each PBF. This consultation uses a crosswalk table format for this purpose. Measurable effects to habitat indicators that correspond to specific PBFs were concluded in this analysis. **Error! Reference source not found.** summarizes the analysis for effects of the three project elements (livestock use, permittee livestock management and infrastructure maintenance, and monitoring) to the PBFs for MCR steelhead designated CH. The rational for the end of grazing use indicators and their role in reducing carryover impacts from annual grazing is presented in section 7.1. The analysis of the Proposed Action's component effects on the existing environmental baseline and PBFs are presented in section 7.5, and 7.6. Analysis of direct and indirect effects to listed species and designated CH are identified and those indicators negatively and measurably impacted are specifically discussed.

The determination of effects of the project elements on the indicators is approached by looking at direct and indirect effects to the species and/or critical habitat. The analytical process considers:

Proximity – the geographic relationship between the project element of action and the species/designated critical habitat.

Probability – the likelihood that the species or habitat will be exposed to the biotic or abiotic effects of the project element or action to the indicator.

Magnitude – the severity and intensity of the effect.

Distribution – the geographic area in which the disturbance would occur (this may be several small effects or one large effect).

Frequency – how often the effect would occur

Duration – how long the effect would last. Potential categories include short term events whose effects subside immediately (pulse effect); sustained, long-term effect, or chronic effect whose effects persist (press effect); and permanent event(s) that sets a new threshold for a species' environment (threshold effect).

Timing – when the effect would occur in relation to the species' life-history patterns.

Nature – effects of the action on elements of a species life cycle, population size or variability, or distribution; or on the physical and/or biological features of critical habitat, including direct and indirect effects.

Table 27. Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators

PATHWAY INDICATORS **Beech Allotment**		**ENVIRONMENTAL BASELINE**			**EFFECTS OF THE ACTION(S)**								
					PBF 1 Freshwater Spawning			**PBF 2 Freshwater Rearing**			**PBF 3 Fresh Water Migration**		
		Properly Functioning	**At Risk**	**Not Properly Functioning**	**Restore**	**Maintain Neutral**	**Degrade**	**Restore**	**Maintain Neutral**	**Degrade**	**Restore**	**Maintain Neutral**	**Degrade**
Water Quality	Temperature			X		PE 2 PE 5	**PE 1 M**		PE 2 PE 5	**PE 1 M**		PE 1 PE 2 PE 5	
	Sediment Turbidity			X			**PE 1 M** PE 2 NM PE 5 NM			**PE 1 M** PE 2 NM PE 5 NM		PE 1 PE 2 PE 5	
	Chemical Contaminants and Nutrients		X			PE 5	PE 1 NM PE 2 NM		PE 5	PE 1 NM PE 2 NM		PE 1 PE 2 PE 5	
Habitat Access	Physical Barriers			X		PE 1 PE 2 PE 5			PE 1 PE 2 PE 5			PE 1 PE 2 PE 5	
Habitat Elements	Substrate Embeddness			X		PE 5	**PE 1 M** PE 2 NM		PE 5	**PE 1 M** PE 2 NM		PE 1 PE 2 PE 5	
	Large Woody Debris			X		PE 2 PE 5	PE 1 NM		PE 2 PE 5	**PE 1 M**		PE 1 PE 2 PE 5	
	Pool Frequency			X		PE 2 PE 5	PE 1 NM		PE 2 PE 5	PE 1 NM		PE 1 PE 2 PE 5	
	Pool Quality			X		PE 2 PE 5	PE 1 NM		PE 2 PE 5	PE 1 NM		PE 1 PE 2 PE 5	
	Off-Channel Habitat		X			PE 2 PE 5	PE 1 NM		PE 2 PE 5	PE 1 NM		PE 1 PE 2 PE 5	
	Refugia			X		PE 2 PE 5	**PE 1 M**		PE 2 PE 5	**PE 1 M**		PE 1 PE 2 PE 5	

PATHWAY INDICATORS Beech Allotment		ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)								
					PBF 1 Freshwater Spawning			PBF 2 Freshwater Rearing			PBF 3 Fresh Water Migration		
		Properly Functioning	At Risk	Not Properly Functioning	Restore	Maintain Neutral	Degrade	Restore	Maintain Neutral	Degrade	Restore	Maintain Neutral	Degrade
Channel Condition and Dynamics	Width to Depth Ratio			X		PE 2 PE 5	PE 1 NM		PE 2 PE 5	PE 1 NM		PE 1 PE2 PE5	
	Streambank Condition		X			PE 1 PE 2 PE 5			PE 1 PE 2 PE 5			PE 1 PE2 PE5	
	Floodplain Connectivity			X		PE 2 PE 5	PE 1 NM		PE 2 PE 5	PE 1 NM		PE 1 PE2 PE5	
Flow/ Hydrology	Change in Peak/Base Flows		X			PE 5	PE 1 NM PE 2 NM		PE 5	PE 1 NM PE 2 NM		PE 1 PE2 PE5	
	Drainage Network Increase			X		PE 1 PE 2 PE 5			PE 1 PE 2 PE 5			PE 1 PE2 PE5	
Watershed Conditions	Roads		X			PE 1 PE 2 PE 3			PE 1 PE 2 PE 3			PE 1 PE2 PE5	
	Riparian Habitat Conservation Areas (RHCA)s		X			PE 2 PE 5	PE 1NM		PE 2 PE 5	PE 1NM		PE 1 PE2 PE5	

M – Measurable

NM – Not Measurable

Project Element 1 = PE-1 (livestock use)

Project Element 2 = PE-2 (permittee management and infrastructure maintenance)

Project Element 3 = PE-3 (monitoring)

8.6 DIRECT AND INDIRECT EFFECTS TO DESIGNATED CRITICAL HABITAT

This analysis evaluates the direct and indirect effects to specific NMFS indicators that correspond to the physical or biological features (PBFs) of CH. The PBFs are used to describe "those physical or biological features that are essential to the conservation of the listed species." The same sub-set of NMFS MPI indicators evaluated for effects to PBFs also apply to the analysis of effects to the species below.

Those indicator/PE combinations for which a conclusion of effect to an indicator or a component of a PBF was "negative and measurable" are identified specifically below, as they have the potential to adversely affect designated CH. These conclusions were only found for PE 1 (livestock use) and not for PE 2 (permittee management and infrastructure maintenance) or PE 5 (monitoring). The indicators for which "negative and measurable" effects were concluded for the Beech On/Off allotment are those bolded below:

Water Temperature
Sediment/Turbidity
Chemical Contaminants and Nutrients
Physical Barriers
Substrate Embeddedness
Large Woody Debris
Pool Frequency
Pool Quality
Off-Channel Habitat
Refugia
Width to Depth Ratio
Streambank Condition
Floodplain Connectivity
Change in Peak/Base Flows
Drainage Network Increase
Roads
Riparian Habitat Conservation Areas (RHCAs)

8.6.1 **Water Temperature:**

Livestock use (PE 1) can result in measurable water temperature increases for certain stream reaches. These impacts are expected to be generally confined to low gradient stream channels less than 10 feet wide with grass/grass-like vegetation providing shade that are being actively grazed. Streams with woody browse species in the riparian community can also be affected by livestock use on plants such as willows and red-osier dogwood which are commonly found in riparian areas of the MNF.

Where existing temperatures are too high because of reduced shade, salmonid survival can decrease, and some habitat may be abandoned as fish migrate to seek cooler temperatures. Many grass/grass-like species found on the MNF have an ungrazed potential height of 21 inches (Kinney and Clary 1994) and some species such as small-fruit bull rush (*Scirpus microcarpus*), big-leaf sedge (*Carex amplifolia*), and tufted hairgrass (*Deschampsia cespitosa*) have potential heights of 3 feet or more (Rausch, personal communication).

In meadow streams with narrow channels, the grass and grass-like species are often the only plants that provide stream shade. PE 1 (livestock use) will potentially reduce vegetation heights to 6 inches (stubble height standard). This will reduce stream shade in those circumstances compared to the ungrazed potential vegetation heights.

The available stream temperature monitoring data for the Beech allotment indicates that State water quality standards are not being met on East Fork Beech Creek. The data was collected in a low water year (2014). The PIBO data indicates that stream temperatures have ranged between 74 and 68 Fahrenheit (F) on East Fork Beech Creek between 2002-2016. The Beef pasture in Beech On/Off provides livestock access to East Fork Beech creek as does and a 15-foot water gap on Patterson pasture. Beef pasture is typically used for two to four weeks in June into the first week of July. Given the Proposed Action of grazing on CH and MSRA on East Fork Beech Creek, including during June when steelhead redds are developing, there is a more than insignificant risk of impacts to streamside vegetation protecting CH. Impacts should be reduced by the timing of grazing, with the longest duration of grazing being four weeks. The actions for the other allotments are described in the other two Biological Assessments (John Day and Mt. Vernon allotments).

The effect to this indicator by PE 1 (livestock use) is negative and measurable.

PE 2 (permittee livestock management and infrastructure maintenance) and PE 5 (monitoring) activities will not remove vegetation that provides shade nor affect channel-forming processes that might widen stream channels. Consequently, there is no mechanism for PEs 2 and 5 to affect water temperature and the effect of the PEs **to the indicator is neutral**.

8.6.2 Sediment/Turbidity and Substrate Embeddedness

The Beech On/Off allotment allows livestock access to approximately 1.2 miles of unfenced CH. Livestock use (PE 1) along streams results in trampled and grazed riparian vegetation and can alter stream banks. Livestock trailing along streams and use of trails to access streams for water also creates disturbed areas of bare soil prone to erosion and can result in fine sediment entering stream channels, increasing turbidity. The effects to CH from increases in fine sediment are to fill in interstitial spaces of the streambed (see embeddedness) which include decreases in water quality, causes species composition shifts in macroinvertebrate communities to those more tolerant of pollution, and loss of cover for larval and juveniles' fishes.

East Fork Beech Creek in the project area was identified on the state of Oregon's 303(d) list for biocriteria, which looks at the composition of the macroinvertebrate communities and their tolerance to polluted waters. Fine sediment levels in East Fork Beech Creek vary but have remained below 20% in portions of the Beech Creek On/Off Allotment. In other reaches, including Reach 5 (Beef pasture) and upstream in the next reach of Forest Service lands (Reach 7) % fines are above the 20% (or less) desired levels. Current PIBO monitoring information within the allotment show percent fines < 2 mm as ranging from 2.9 to 13.8 percent and D50 ranged from 1.5 to 2.4 inches (which indicates a gravel dominated system). As discussed above, some of the areas accessible to cattle in this allotment are adjacent to unfenced stream sections used by MCR steelhead for spawning, incubation, larval development, and rearing. The duration of 14-30 days in Beef pasture is in conjunction with private lands. Distribution of the livestock during the time they are on Beef pasture is not well documented, but stubbleheight at the DMA has consistently been above nine inches. **Because of the risk of sedimentation from livestock access the effect to this indicator by PE1 (livestock use) is considered negative and not expected to be insignificant and discountable but is measurable.**

There is the potential for fine sediment to slightly increase embeddedness within gravels suitable for spawning when the gravel is located immediately downstream from exposed and disturbed streambank areas. High embeddedness values were observed in four of five reaches in East Fork Beech Creek (Section 4.2). Increased embeddedness may result in a decrease in the potential for production of aquatic macroinvertebrates (a forage item for rearing salmonids) in patches of habitat. Embeddedness fills interstitial spaces (space between rocks) used by rearing juveniles as they forage. Because of the duration of the grazing period referenced above the conclusion is that livestock use **(PE 1) will have a negative and measurable effect on substrate embeddedness within CH with respect to adult spawning and juvenile rearing and foraging.**

8.6.3 Large Woody Debris

Large woody debris (LWD) is an important component of non-meadow stream systems and provides cover, substrate for macroinvertebrate production, lessens impacts from solar gain, and is integral to the creation of complex habitat features including quality pools and areas of sorted gravels that create ideal spawning substrate.

While the baseline in this basin for LWD is Not Properly Functioning on East Fork Beech Creek, there has been recent restoration to increase levels of large wood and remove the channel spanning weirs installed over 25 years ago. The installed log weirs are being removed because of the outdated design of these channel spawning structures which inhibit fish movement and can negatively impact stream functioning. LWD levels are below desired in all surveyed reaches, however livestock grazing has no measurable effect on this indicator in conifer-dominated riparian forests. Livestock use can negatively affect this indicator when grazing occurs within hardwood stands that could contribute larger pieces of wood to small streams. Because areas that would naturally be dominated by cottonwood gallery riparian forests or aspen stands are not documented in this allotment, livestock use (PE 1) will not result in altering the level of stocking and future large tree (and subsequent large woody debris) recruitment from those sources.

By not exceeding the grazing use indicators and implementing adaptive management **the effect to this indicator by livestock use (PE 1) is not measurable for this allotment.**

PE 2 and PE 5 do not affect trees and associated LWD. Therefore, there is no mechanism for an effect and the effect is neutral to the indicator for both PEs.

8.6.4 Refugia

The availability of refugia is a limiting factor identified in the recovery plan for the Oregon steelhead population of the MCR steelhead distinct population segment (NMFS 2009). The NMFS MPI (NMFS 1996) defines the Refugia indicator as: "important remnant habitat for sensitive aquatic species." All the indicators are potential components of or impact the quality of Refugia. Analysis of previous indicators (water temperature, fine sediment, substrate embeddedness) on the inter-related allotment (including the adjacent John Day allotment) has determined that PE 1 (livestock use) will have negative and meaningfully measured effects to them. The effects may occur in stream reaches providing refugia conditions for one or more of these habitat characteristics (e.g., areas with cooler water temperatures, low levels of sediment in substrate or the water column, and low levels of substrate embeddedness). Consequently, while impacts in Beech On/Off may be limited for the indicators due to the scale of the allotment, there is an overall negative and measurable impact collectively to the Refugia indicator. The effects are not expected to be distributed evenly across the ESA action area because stream reaches providing characteristics of refugia occur in areas less accessible by livestock, or some streams lack the characteristics of refugia due to the current degraded baseline from legacy impacts. Negative impacts to the Refugia indicator will be minimized by not exceeding the end of grazing use indicators, implementation of

adaptive management and use of PDCs. Stream surveys, temperature monitoring, and PIBO surveys will be the primary methods to track Refugia (as habitat complexity with appropriate thermal regimes) through time.

The highest level of effect to previous indicators by PE 2 (permittee management and infrastructure maintenance) was "negative but not meaningfully measurable." This level of effects will not impact the function of Refugia to provide important remnant habitat. Therefore, the effect conclusion is neutral for PE 2.

The highest level of effect to previous indicators by PE 5 (monitoring) was "negative but not meaningfully measurable" for small and transient increases in turbidity by wading in stream channels or crossing streams on foot or by horse. This level of effects will not impact the function of Refugia to provide important remnant habitat. Therefore, the effect conclusion is also neutral for the PE 5.

The effects from the Proposed Action to the indicators below are not measurable.

8.6.5 Physical Barriers

No barriers to freshwater migration will be created or removed by the actions of any PE in the Action Area. All PEs have a neutral effect on the physical barriers indicator.

8.6.6 Pool Frequency

Indirect effects of livestock grazing (including trailing and watering), on bank stability, undercut banks, width-depth ratio, shrub recruitment, green line plant composition and vigor have the potential to affect this indicator. Adequate levels of pools/mile are desired to provide hiding and foraging cover, rearing habitat, and locations for adult resting. Desired levels of pool frequency are lacking in East Fork Beech Creek (**Error! Reference source not found.**). Specific levels (where available) for this allotment have been presented in stream survey and PIBO data summaries (Environmental Baseline Section 4.2). Pools per mile currently do not meet the Proper Functioning Condition for the NMFS MPI matrix or Forest Plan RMO's for East Fork Beech Creek in this allotment.

By not exceeding the end of grazing use indicators and implementation of adaptive management, existing pool conditions should be maintained. Active stream restoration is often needed to improve pool frequency conditions and instream restoration and occurred in East Fork Beech creek. **Effects from PE 1 (livestock use) to pool frequency are not measurable due to indirect causal effects.** Trend monitoring will help identify the condition of those components important to pool formation (such as LWD and substrate composition) in the long term, and if the proposed actions are maintaining or improving those components.

The overall effect of PE 2 (permittee management and infrastructure maintenance) is neutral to CH and pool frequency due to the limited seasons, limited time, and location of existing infrastructure away from CH.

PE 5 (monitoring) does not have any mechanisms to affect plants or bank and channel features that would impact pool frequency. The monitoring PE has a neutral effect to the indicator.

8.6.7 Pool Quality

Quality pool habitat is provided by the presence of deep pools that provide cover, forage, and resting habitat for listed fishes. Overhead cover in the form of undercut banks, large wood, large substrate, and overhanging riparian

bank vegetation are also components of quality pools. Based upon the stream survey data in Appendix D, pool quality would be NPF in this action area using NMFS MPI criteria. The only pool over 3 feet deep was in the first reach of East Fork Beech creek.

Effects from PE 1 (livestock use) to pool quality are not measurable due to indirect causal effect and the numerous factors that provide quality pools.

The overall effect of PE 2 (permittee management and infrastructure maintenance) is a neutral affect to the indicator.

PE 5 (monitoring) does not have any mechanisms to affect plants or bank and channel features that would impact pool quality. The monitoring PE has a neutral effect to the indicator.

8.6.8 Off Channel Habitat

The current condition of off-channel habitat is likely degraded in the Action Area from legacy management and activities, including, timber harvest, home steading, road building, and historic livestock management. Off-channel habitat is limited or non-existent in steeper gradient streams and is most often associated with larger or low gradient streams or streams reaches on the MNF. Some off-channel habitat is a likely outcome from stream restoration that has installed "beaver dam analogs" and LWD to East Fork Beech creek. That work has also reduced the number of channel spanning weirs installed over 25 years ago.

By not exceeding the end of grazing use indicators, implementing BMPs for livestock management), and implementation of adaptive management, existing conditions for off-channel habitat should be maintained. Active restoration will continue to improve off-channel habitats in the Action Area. **PE 1 (livestock use) to off-channel habitat that is negative and not measurable.**

PE 2 (permittee management and infrastructure maintenance) includes on and off-road vehicle use. PDC 12 (off-road use) will prevent bank damage and effects to off-channel habitat. Infrastructure maintenance actions can affect streambanks, riparian vegetation, or off-channel habitats within the Action Area. The effects are limited by PDC 12 and the amount of impact specific to **PE 2 is not measurable** because of the limited locations, timing, and duration of maintenance activities.

PE 5 (monitoring) does not have any mechanisms to affect off-channel habitat. **PE 5 has a neutral effect to the indicator.**

8.6.9 Width to Depth

Over-utilization of riparian vegetation, bank alteration, lack of large wood material and increases in sediment delivery are primary causes of increased W/D ratios due to grazing. This supports simplified habitat that lack pools and undercut banks reducing the quality of juvenile rearing habitat and floodplain connection. PIBO data (Table 9) indicates that some reaches are closer to reference condition and width: depth ratios have improved over time. Based on stream survey data (Table 12) many of the streams within the John Day allotment are still exhibiting over widened stream channels. Legacy effects have contributed to degradation of this indicator.

Livestock use (PE 1) can have negative effects to the indicator, but they are not measurable due to the many factors through time that change stream channel form (run-off patterns, erosion, disturbances such as wildfire,

etc.). The potential for continued increases in W/D ratio from livestock grazing is less than in the past because of increased protection of sensitive areas by resting and by pasture rotations.

PE 2 The overall effect of PE 2 is a not measurable to the indicator.

PE 5 (monitoring) does not remove vegetation or destabilize stream banks. There is no potential for it to increase W/D ratio. **PE-5 (monitoring) will have a neutral effect to the indicator.**

8.6.10 Chemical Contaminants and Nutrients

The potential for chemical contaminants or nutrients to effect CH is by the addition of specific materials such as petroleum, oil products, nitrogen, or phosphorus. Petroleum and oil products which reach stream systems or wetlands can impact organisms which depend on oxygen and the products or nutrients can travel to impact downstream areas. The relatively small number of chemical materials in the action areas and associated with the Proposed Action, the limited time they are adjacent to streams (e.g. vehicles), and their proper storage prevents impacts to CH.

Excessive nutrients in stream systems are undesirable primarily because of their effect on CH includes increasing algal growth and accompanying oxygen demand, which has a negative effect on cold water fish habitat. Urine and feces from livestock use (PE 1) in riparian areas increases the likelihood that nitrogen and phosphorous will enter streams. Increased nutrients will likely increase stream productivity at the source of nutrients and for a short distance downstream. Distribution of livestock away from riparian areas helps to eliminate the effect from livestock nutrient contributions. **PE 1 (livestock use) has no effect from chemical contaminants. The overall effect to this indicator from PE 1 is slightly negative, but difficult to measure the portion due to livestock in relation to wildlife or other sources such as leaf decay.**

PE 2 (permittee management and infrastructure maintenance) includes vehicle use. The risk of chemical contamination to streams will be minimized by use of PDCs. Maintenance activities are typically distant from designated CH and vegetation provides a buffer to potential petroleum spills. Nutrient and salt blocks are not allowed near streams where they could contribute nutrients or chemicals to a waterway. **The overall effect from PE 2 is for slight negative effects to the indicator that are not expected to be measurable.**

Monitoring (PE 5) does not involve the use of chemicals and does not have the potential to affect nutrients in streams. **PE 5 will have a neutral effect to the indicator.**

8.6.11 Streambank Condition

Properly functioning (PF) stream bank condition is defined in the NMFS matrix as >90% stable and not properly functioning (NPF) condition is <80% stable. On Beech On/Off allotment and the inter-related allotments of John Day and Mt Vernon, the stream survey and PIBO data presented in Section 4.2 of the BAs indicate that surveyed streams all have over 90% bank stability. Greenline vegetation, the type of channel (steep or lower gradient), and parent geologic material (coarse or fine materials) contribute to the natural streambank condition. On the MNF legacy management, including timber harvest, mining, road development, and grazing has altered many systems leaving banks of coarse material that are not easily destabilized. In meadow and other sensitive systems livestock grazing can contribute to loss of bank stabilization. With the six-inch stubble height endpoint indicator, which also helps prevent livestock from shifting to woody browse use (Clary and Webster 1989) the conclusion is that the effect of **PE 1 to this indicator is negative and not measurable.**

PE 2 and PE 5 are not of the frequency, duration or magnitude to significantly affect bank stability and are neutral to this indicator.

8.6.12 Floodplain Connectivity

Lowered water tables and/or channel entrenchment often accompany the loss of floodplain connectivity. Floodplain connectivity was historically impacted throughout the action area by loss of beavers, logging, road development, and historic livestock use. Sections of East Fork Beech Creek exhibit the impacts as evident through high W/D ratios or loss of undercut banks.

Indirect effects of livestock use (PE 1), including trailing and watering on attributes such as bank stability, undercut banks, width to depth ratio, shrub recruitment, and green line plant vigor have limited some streams' ability to access their flood plains; thus, concentrating energies within confined channels and/or causing additional erosion through loss of sediment holding greenline vegetation species. Active restoration has occurred in this allotment on East Fork Beech creek to re-connect floodplains. Floodplain function is expected to improve with the restoration, which will be monitored during this consultation.

The conclusion is that the effect to floodplain connectivity by livestock use in the Beech On/Off allotment is negative but not measurable.

PE 2 (permittee management and infrastructure maintenance) includes on and off-road vehicle use. PDC 12 for (off-road use) will help minimize floodplain impacts. Most infrastructure maintenance actions do not affect streambanks or riparian vegetation adjacent to CH and will therefore not affect floodplain connectivity. **The overall effect of PE 2 is a neutral affect to the indicator.**

Monitoring (PE 5) does not remove riparian vegetation or otherwise have mechanisms to impact habitat complexity. **PE 5 will have a neutral effect to the indicator and the environmental baseline.**

8.6.13 Change in Peak/Base Flows

Changes in peak and base flows are mostly governed at the watershed scale by geology, overall vegetative cover type and condition, density of road networks, and the condition of floodplains and wetlands. **PE 1 (livestock use) use does not have a significant effect on this indicator. PE 2 (permittee management and infrastructure maintenance) and PE 5 (monitoring) do not have effects to this indicator; therefore the effects are neutral.**

8.6.14 Drainage Network Increase

In the Action Area the drainage network environmental baseline has been expanded by the presence of roads and continued road building up into the 1980s. Stream valley bottom roads are common. **None of the three PEs will affect the baseline for this indicator.**

8.6.15 Roads

In the consultation area the baseline road density and location rate as NPF in most sub-watersheds. Due to legacy management the MNF has many valley bottom roads adjacent to streams. Most sub-watersheds also have

relatively high road densities. There is a portion of Inventoried Roadless Area within this allotment. **None of the three PEs will affect the baseline for this indicator.**

8.6.16 Riparian Habitat Conservation Areas (RHCAs)

Riparian habitat conservation areas (RHCAs) are vital for providing shade, large woody debris recruitment, stream connectivity, and diverse vegetation communities. Properly functioning RHCA's help maintain cool stream temperatures, maintain water tables, and prevent sediment from entering streams. The MNF has a variety of plant associations and plant communities within the Action Area (Crowe and Clausnitzer 1997). Legacy actions have simplified or altered riparian conditions through fire exclusion, irrigation, homesteading, logging, road building, and grazing. The potential for many riparian area vegetative communities has not been site specifically identified on the MNF. PE 1 (livestock use) can result in negative effects within riparian areas by grazing on preferred plant species, including cottonwoods, willows, sedges, and native grasses. The baseline in the East Fork Beech creek would be rated as "At Risk" or "Not Properly Functioning" due to loss of aquatic refugia, fragmentation from road locations, and moderate loss of LWD.

Through implementing proposed pasture rotations on these inter-related allotments, including exclosure fencing on lower Clear Creek in the John Day allotment, together with not exceeding the end of grazing use indicators, and adaptive management, negative effects should not rise to the level the processes and functions of RHCAs are measurably impacted. **PE 1 has no measurable effect on this indicator.** If monitoring fails to show an improving trend in the riparian attributes under the proposed actions, re-initiation of consultation may be necessary.

The highest level of effect to previous indicators by PE was "negative but not meaningfully measurable." This level of effects will not impact the processes and functions of RHCAs. **Therefore, the effect conclusion is neutral for PE 2.**

PE 5 (monitoring) does not have any mechanisms to affect the processes and functions of RHCAs. PE 5 has a neutral effect to the indicator.

8.7 DIRECT AND INDIRECT EFFECTS TO THE SPECIES

Effects to MCR steelhead from livestock grazing can be in the form of direct impacts to individual fish or indirectly through habitat disturbance. Direct disturbance includes trampling of redds, resulting in injury or death to incubating embryos or alevins; disturbing holding or spawning adults, forcing them to alter their behavior and seek cover; or disturbing rearing juveniles, forcing them to alter their behavior and seek cover.

Use of the NMFS MPI to determine effects to listed fish species is based upon using the effects of the action on habitat indicators as a surrogate for effects to the species. The premise is that the indicators and the range of environmental baseline conditions provided by the three classifications (PF/AR/NPF for the NMFS MPI) depict the biological requirements of the listed fish species. Since there is a direct relationship between habitat condition and the growth and survival of individual fish at various life stages, the effects of the Proposed Action on habitat variables can be linked to effects to individuals of the species, and ultimately to an ESA effect determination.

Those indicator/PE combinations for which a conclusion of effect to an indicator or a component of a PBF was "negative and measurable" are identified specifically below, as they have the potential to adversely affect MCR steelhead. These conclusions were only found for PE 1 (livestock use) and not for PE 2 (permittee management

and infrastructure maintenance) or PE 5 (monitoring). The indicators for which "negative and measurable" effects were concluded for the Beech On/Off allotment are bolded below:

Water Temperature
Sediment/Turbidity
Chemical Contaminants and Nutrients
Physical Barriers
Substrate Embeddedness
Large Woody Debris
Pool Frequency
Pool Quality
Off-Channel Habitat
Refugia
Width to Depth Ratio
Streambank Condition
Floodplain Connectivity
Change in Peak/Base Flows
Drainage Network Increase
Roads
Riparian Habitat Conservation Areas (RHCAs)

8.7.1 Water Temperature

Water temperature is an important factor affecting distribution and abundance of salmonids within the action area. Water temperatures influence water chemistry, as well as every phase of salmonid life history. Optimal temperatures for steelhead are 50˚ to 61˚ F (10˚ to 16˚ C), and the lethal temperature is approximately 77˚ F (25˚ C). Stream temperatures are of particular concern within the John Day Subbasin. This is highlighted in the John Day Subbasin Plan (NPCC 2005) as well as the MCR Steelhead Recovery Plan (NMFS 2009). Degraded water quality, which includes elevated water temperatures, is identified as a "Limiting Factor" in both plans.

Analysis of 2014 water temperature monitoring data (a low flow year) for East Fork Beech Creek in this allotment indicates that standards for water temperature are exceeded during the summer months. Within the Action Area, high stream temperatures occur near the end of July or the beginning of August and coincide with low stream flows and warm daytime temperatures. By the end of August, stream temperatures are typically dropping as the air temperatures continually drop. Criteria for anadromous salmonid freshwater temperatures are found in the NMFS MPI table presented earlier. Belsky et al. (1999) states that when water temperatures increase to critical levels due to reduced shade, salmonid survival can decrease and some habitat may be abandoned as fish migrate to seek cooler temperatures. It should be noted that water temperatures are typically below concern thresholds when spawning, incubation and larval development of MCR steelhead occurs, as spring flows are greater than later in the year.

PE 1 (livestock use) is from Beech On/Off as indicated by stubble height monitoring (over nine inches each year) may not be contributing to measurable water temperature increases from use on the NFS lands of Beef pasture. However, inter-related impacts are expected on other low gradient stream channels less than 10 feet wide with grass/grass-like vegetation providing shade in the Action Area. **The effect to this indicator by PE 1 (livestock use) on all three allotments together is considered negative and measurable.**

The assumption is that meeting end of grazing use indicators would move key riparian and stream channel elements (bank stability, w/d ratio, woody species regeneration) towards their Desired Conditions and meet Riparian Objectives. If monitoring fails to show this upward trend, adaptive management and administrative actions would be implemented to continue to minimize adverse effects MCR steelhead.

PE 2 (permittee livestock management and infrastructure maintenance) and PE 5 (monitoring) activities will not remove vegetation that provides shade nor affect channel-forming processes that might widen stream channels. Consequently, there is no mechanism for **PE 2 or PE 5 to affect water temperature and the effect of the PEs to the indicator is neutral.**

8.7.2 Sediment/Turbidity and Substrate Embeddedness

Grazing by large herbivores can result in hoof shear to streambanks and trampling and consumption of streamside vegetation. The result is a potential increase in the supply of fine sediment available for transport. This can occur when grazing results in compacted soils and bare areas; and when grazing results in decreased bank stability through mechanical damage to streambanks or reductions in rooting strength of streambank stabilizing vegetation. Both result in an increase in erosion rates and subsequent increases in fine sediment levels in streams.

Small amounts of fine sediment are likely to enter streams where livestock access streams to cross, loaf, or water, or tail along. Small amounts of fine sediment are likely to become deposited in substrate that can decrease egg-to-fry survival and slightly reduce available substrate cover for juveniles and macro-invertebrates. Sediment can also impact behavioral responses of juvenile and fish causing them to leave preferred habitat and increasing the risk to predation (Muck 2010 and Jensen et al. 2009).

Increased fine sediment is detrimental to MCR steelhead through increased turbidity and sediment deposition in the substrate. Increases in fine sediment lead to greater substrate embeddedness and a decrease in the interstitial spaces between gravel substrate important for salmonid spawning. Successful salmonid spawning requires clean gravels with low fine sediment content (Spence et al. 1996). Well-oxygenated water must be able to reach eggs and pre-emergent fry during incubation and emergence. Suffocation of these life stages may occur if redds become covered with fine sediment. Emerging fry may be physically blocked from escaping a redd. Increased sediment load is also detrimental to juvenile salmon by introducing suspended particulate matter that interferes with feeding and territorial behavior (Berg and Northcote 1985). Increased fine sediment deposition in the substrate is likely to decrease egg-to-fry survival (Spence et al. 1996).

In addition, inputs of fine sediment resulting from livestock trampling banks can shift benthic community composition or reduce benthic invertebrate abundance and lead to a shift from aquatic insects to mollusks, which are less palatable to salmonids. 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).

There is one stream (East Fork Beech Creek from mile 0 to 12.4) in the Action Area that has been identified on the 303(d) list for biological criteria (**Error! Reference source not found.**). See Section 4 for PIBO results for the allotment and Appendix D for 2014 stream inventories.

PE 1 (livestock use) will result in sediment entering stream channels. The mechanisms include: 1) mechanical bank damage from hoof chisel and trampling; 2) trailing; and, 3) impacts to soil-holding vegetation by being eaten and trampled. These mechanisms can negatively impact bank stability, resulting

in increased width to depth, erosion, and increase fines downstream. The increases in fine sediment will negatively and measurably affect the Sediment/Turbidity and Substrate Embeddedness NMFS MPI.

These effects to the Sediment/Turbidity and Substrate Embeddedness indicators, especially streambank alteration will be minimized by use the end of grazing use indicators. If pre-season monitoring indicates that wild ungulate use is resulting in measurements near or exceeding an endpoint indicator, livestock will not be turned-out into that specific pasture. These indicators and the water quality BMPs were developed to meet PACFISH grazing standards and guidelines. The assumption is that meeting these end of grazing use indicators would move key riparian and stream channel elements (bank stability, w/d ratio, woody species regeneration) towards their desired conditions and meet riparian objectives. If monitoring fails to show this upward trend, adaptive management and administrative actions would be implemented to continue to minimize adverse effects to designated CH and the listed MCR steelhead. It should be noted some impacts from past management activities (logging, roads, grazing) will persist over the life of this consultation and likely much longer in some cases.

Direct impacts are likely to occur if livestock wade into a stream and disturb rearing juveniles or spawning adults, and/or step on redds. Juveniles in close proximity to stream crossings or watering sites are likely to move out of an area when livestock enter or approach the stream. Juveniles are likely to be at increased risk of predation. Livestock will have access to spawning CH in the allotments during the spawning period. It is likely that spawning behavior will be interrupted, forcing adults to retreat to nearby cover, and that redds will be at risk of being stepped on. Risks will be minimized by implementation of the spawning surveys and redd avoidance as described in the Common to All (Section 6.1).

The potential for direct impacts from PE 2 (permittee management and infrastructure maintenance) is much smaller. Road use has no potential for direct impacts to the species. PDC 12 do not allow off-road vehicles to cross streams except for use of existing fords on road crossings. Either grazing will not occur in pastures with steelhead spawning prior to emergence (before July 1) or range riders on horses will occasionally cross streams, but redds will be identified by provided maps and flagging. Those areas of redds should be avoided. Infrastructure maintenance actions are not located in stream channels, so there is no mechanism for direct impacts to the species.

Some monitoring activities (PE 5) involve walking in stream channels. Actions such as pebble counts and redd surveys will result in individuals walking across stream channels for time periods that may result in MCR steelhead being disturbed and moving out of the area, resulting in direct impacts to the species. Spawning survey monitoring activities (PE 5) involve walking in stream channels for periods of time that may result in MCR steelhead being disturbed and moving out of the area, resulting in direct impacts to the species.

8.7.3 Large Woody Material

Large woody material (aka large wood) is one of the most important habitat components in many fish-bearing streams (Gurnell et al. 2002). Large wood helps provide cover, scour pools, stabilize banks, retain spawning gravels, create off-channel habitats, and provide habitat for macroinvertebrate production (Gregory et al. 2003).

In streams within the action area, large wood is usually provided by fallen conifers that have no effect from the project elements. However, in some areas where hardwoods—particularly black cottonwood and quaking aspen—play an important role in riparian species composition, ungulate grazing can prevent future large wood

recruitment by limiting sapling regeneration and large tree recruitment. Young cottonwoods are desirable forage to both domestic and wild ungulates (Braatne et al. 1996).

Kaufman et al. (1983) found late season riparian cattle grazing retarded regeneration of black cottonwood saplings in northeastern Oregon. Another study found when cattle were removed from a riparian pasture, but wild ungulates were not exclosed, the number of black cottonwood seedlings/saplings increased 56% 3 years after livestock removal (Case and Kaufman 1997). Clearly, livestock grazing can influence the abundance of black cottonwoods in a riparian area, which can have measurable and foreseeable future effects to riparian structure and future large wood recruitment. Beschta and Ripple (2005) surveyed a 40-mile reach of the Middle Fork John Day River for cottonwood abundance and stand structure and found very little cottonwood seedling/sapling regeneration or recruitment into large trees and described wild and domestic ungulate browsing as the primary causal factor.

The analysis of effects to PBFs of CH for MCR steelhead, indicate that the PE 1(livestock use) will not have negative and meaningfully measured effects to the "Large Woody Material" MPI indicator that correlates to components of PBFs in the John Day allotment.

PE 2 and PE 5 will have no effect on the indicator of LWD.

8.7.4 Refugia

The concept of "Refugia" is not described in detail in the NMFS MPI (NMFS 1996). The definition provided in NMFS (1998) is: "important remnant habitat for sensitive aquatic species." The availability of various types of habitat refugia are described as limiting factors in the NMFS 2009 recovery plan for the Oregon steelhead populations of the MCR steelhead DPS (e.g., loss of side-channels that provided high flow refugia; cold water refugia provided by Columbia River tributary streams such as the Deschutes River).

The analysis of effects to PBFs of CH for MCR steelhead indicate that the PE 1 (livestock use) will have negative and measurable effects to several of the NMFS MPI that correlate to components of PBFs. Specifically, the indicators are Water Temperature, Sediment/Turbidity, and Substrate Embeddedness. This may occur in stream reaches in the inter-related allotments which provide refugia conditions for one or more of these habitat characteristics (areas with cooler water temperatures, low levels of sediment in substrate or the water column, and low levels of substrate embeddedness). **Therefore, PE 1 will have a negative effect to the Refugia indicator.**

The effects are not expected to be distributed evenly across the Action Area, because stream reaches providing characteristics of refugia occur in areas less accessible by livestock, or some streams lack the characteristics of refugia due to the current degraded baseline from legacy impacts. Negative impacts to the Refugia indicator will be minimized by the end of grazing use of the endpoint indicators and PDCs.

Recovery of riparian vegetation results in the development of more complex habitat. Riparian recovery allows roots to stabilize streambanks, and stems and foliage to slow water velocities, trap fine sediment, provide overhead cover for fish, provide shade that may aid in keeping stream temperatures cool, and provide surfaces for macroinvertebrates to inhabit. Stable stream banks and fine sediment trapping result in less fine sediment in spawning substrate that would improve egg-to-fry survival (Bjornn and Reiser 1991). Reduced water velocities along stream edges increase the amount of available habitat for young salmonids (Bjorn and Reiser 1991). Spawning salmonids appear to prefer spawning in areas in close proximity of overhead cover (Bjorn and Reiser

1991), and overhead cover protects juvenile salmonids from predation. Shade provided by vegetation can be important in keeping stream temperatures cool for salmonids. Li et al. (1994) found that trout abundance decreased as solar input and water temperature increased. Macroinvertebrates inhabiting overhanging vegetation provide forage for juvenile MCR steelhead when they fall into the stream. Each of these benefits contributes to increasing the amount and quality of habitat available for all freshwater life stages of MCR steelhead.

8.7.5 Physical Barriers

No barriers to freshwater migration will be created or removed by the actions of any PE. All PEs have a neutral effect on the physical barriers indicator.

8.7.6 Pool Frequency

See discussion above.

8.7.7 Pool Quality

See discussion above.

8.7.8 Off Channel Habitat

Off-channel habitat is often naturally limited to low gradient stream reaches. The greatest amount of off-channel habitat is normally associated with larger streams in these low gradient areas. The existing condition of off-channel habitat in the Action Area is degraded due to legacy impacts, including removal of beavers, logging, mining, and road construction. Off-channel habitat provides important areas for rearing of juvenile fish and indicates floodplain connectivity that helps maintain baseflows, moderate stream temperatures, and absorb scouring energy during high flow events. **PE 1 (livestock use) does not have a measurable effect on off-channel habitat.**

PE 2 (permittee management of livestock and infrastructure maintenance) has no measurable effect due the location of infrastructure away from streams, the limited footprint of infrastructure, and because PDC 12 guides off-road vehicle use in sensitive areas such as off-channel or side-channel habitat.

PE 5 (monitoring) does not have any mechanisms to affect off-channel habitat

8.7.9 Width to Depth

8.7.10 See discussion above.

8.7.11 Chemical Contaminants and Nutrients

8.7.12 See discussion above.

8.7.13 Streambank Condition

8.7.14 See discussion above.

8.7.15 Floodplain Connectivity

8.7.16 See discussion above.

8.7.17 Change in Peak/Base Flows

8.7.18 See discussion above.

8.7.19 Drainage Network Increase

See discussion above.

8.7.20 Roads

See discussion above.

8.7.21 Riparian Habitat Conservation Areas (RHCAs)

See discussion above.

8.8 SUMMARY OF THE PROPOSED ACTION IN RELATION TO PACFISH/INFISH GM-1

Riparian Management Objectives identified in PACFISH and INFISH that described good habitat were developed using stream inventory data for pool frequency, large woody debris, bank stability and lower bank angle, and width: depth ratios. Favorable water temperatures for specific species and their life histories were also identified. The stream channel condition RMOs provide the criteria against which attainment or progress toward attainment of riparian goals is measured (PACFISH 1995, INFISH 1995) and "they are a target toward which managers are to aim as they conduct resource management activities across the landscape". As both PACFISH (Appendix page C-5) and INFISH (Decision Notice page A-3) stated "Actions that reduce habitat quality, whether existing conditions are better or worse than objective values, would be inconsistent with the purposes of the interim direction".

. To ensure accurate evaluation of grazing management; in this Biological Assessment the MNF intends to monitor endpoint indicators within two weeks of cattle removal from all pastures. The move-triggers and end of grazing use indicators are designed to eliminate negative effects to riparian or aquatic habitats that would carry

over in any meaningful or measurable way to the following grazing season. Implementing them provides a high degree of assurance that livestock management practices will be effective in maintaining or improving the structure and function of stream channel, riparian and aquatic habitat conditions, and helps meet the intent of GM-1.

Key indicators reflective of grazing actions include bank stability, bank angle, width-to-depth, and percent undercut banks. Bank stability, as defined by PIBO, was above 95% on all sites within the three related allotments, including Beech On/Off in this Biological Assessment. Two of the indicators, bank angle and percent undercut banks do not meet managed or reference PIBO mean values at any of the PIBO sites in the three allotments (although Belshaw Creek in Belshaw Riparian Pasture of Mt Vernon Allotment is just at the PIBO managed values for both bank angle and percent undercut banks). Width-to-depth improved in East Fork Beech Creek when last measured (Beech Allotment), and is good (<10) in Belshaw and Birch Creeks in the Mt Vernon Allotment, but is over desired (meaning wider shallower streams) at the Beech Creek I and K sites. The caveat with the PIBO data is that the locations of all the PIBO sites, with the exception of Birch and Belshaw creeks, are influenced by roads and not within catchments of the allotments, but at the margins, thus many other factors may be influencing the condition of the indicators.

Water quality as indicated by stream temperatures does not meet state standards in the John Day Allotment streams. One data set for Thompson Creek was not used, as it was obvious that the data was impacted by air temperatures. The data for Clear Creek, East Fork Beech, and McClellan was reviewed for similar data impacts, but none were observed. Those streams were documented with weekly maximum temperatures of 83F, 74F, and 77F in 2014, which was a low water year, and therefore may have been especially warm with regards to stream temperatures. These temperatures are approaching or at lethal levels for trout and steelhead.

The livestock use (PE 1) on Beech On/Off Allotment is not likely to further result in measurable water temperature increases for stream reaches in East Fork Beech (or Beech Creek which is fenced out). Due to the proposed actions in the related allotments of Mt Vernon and John Day, the overall effect to this indicator by livestock use remains negative and meaningfully measured based on other streams in the larger action area (especially Clear Creek, McClellan Creek, and Thompson Creek).

The proposed actions generally follow past grazing actions.

Across the forest, the MNF has decreased the use of small riparian pastures for gathering. This has helped reduce grazing of MSRA and CH across the MNF. The creation of upland gather pastures, which were proposed in the 2018 BA's, generally have not been constructed and will need to undergo environmental analysis (NEPA) prior to construction. Further improvements in aquatic and riparian habitat will result from decreased use of riparian pastures and further modification of grazing practices, along with continued active restoration, is likely needed to improve habitat diversity and complexity for MCR steelhead (and resident trout) in the Beech Allotment.

9 ESA CUMULATIVE EFFECTS

ESA cumulative effects are those effects of future State, tribal, local or private activities that are reasonably certain to occur in the area of the Federal action subject to consultation. Future Federal actions that are unrelated to the proposed action are not considered in this section because they are subject to separate consultation pursuant to section 7 of the ESA. This On/Off allotment is unique to consultation because of the related private land and the related allotments of Mt Vernon and John Day. There are likely unidentified future State or private activities that are reasonably certain to occur, some of which may have an effect on listed steelhead, including short term detrimental impacts implemented to provide long term beneficial conditions (such as culvert replacement to provide season long fish passage and less impactful flood flows).

9.1 UNAUTHORIZED GRAZING

Forest Service terminology is "excess use" when done by permittees, and "unauthorized grazing" when done by non-permit holders. The Government Accounting Office (GAO) recently conducted a report (2016) on unauthorized grazing, and referred to all grazing violations by permittees or non-permittees as "unauthorized grazing". They considered grazing at an unauthorized time of year, grazing more livestock than allowed under a permit, or grazing outside of permitted areas, and looked at how often formal actions were taken. Excess use has occurred at times in these allotments during the past consultation period, as evidenced by monitoring and photos included in this consultation and the End of Year reports. Ranger District staff most often notifies livestock owners when unauthorized use or excess use is documented with a phone call, followed up by in-person meetings or written communication. Formal letters are documented to their permit files for certain exceedances or actions. As long as the MNF takes timely action whenever unauthorized or excess use occurs, habitat degradation is likely to be minimized. See "Common to All" for FS procedures if excess use or unauthorized grazing occurs.

9.2 ACTIONS ON PRIVATE PROPERTY

The ESA action area includes private property in-holdings. There is the potential for properties to be developed or for other activities that may impact critical habitat. However, we do not have any information on specific proposals at this time. The effects to PCEs of critical habitat of activities on private property, such as livestock grazing, are expected to continue at the same rate as they have been. At this time, we know of no future private activities that are reasonably certain to occur that are outside the range of activities currently taking place.

It should be noted that private land activities are often more intensive than on Forest Service lands. Activities on private lands include: water developments; grazing; irrigation diversions, manipulation of streamside vegetation, clearing of land, etc. Private land in the action area is intermingled with National Forest System lands, as well as in downstream portions of streams within the action area. Adverse impacts to streams and riparian areas from private land activities can be disproportionate to their total area in the drainage. Water diversions for irrigation water are particularly damaging to ESA-listed species and do exist in this action area.

9.3 ODFW ELK AND DEER MANAGEMENT

Oregon Dept. of Fish and Wildlife manages Rocky Mountain elk and mule deer populations in the ESA action area (Beech On/Off, John Day, and Mt Vernon allotments). The action area is located entirely within the State of Oregon's Northside Unit (#47). Current management objectives (MO) for elk are 2,000 for the unit with the population estimated between 2,500 and 2,700 from 2017 – 2021. The population was consistently above the MO

from 2011-2016. The population estimate was stable at 2500 from 2011-2013 before increasing to 2,700 from 2014-2016.

For mule deer, the MO for the Northside unit is set at 15,500. The population is estimated between 2,981 and 6,186 from 2018-2022.The population estimate was also consistently below the MO for the period of 2011-2016. During that period, the population estimate had remained consistently below the MO with a high estimate of 7,228 in 2012 to a low of 6,566 in 2016. Other yearly estimates between 2011-2016 fell within that range.

10 ESA Effects Determination

The ESA determination is “MAY AFFECT, LIKELY TO ADVERSELY AFFECT” MCR Steelhead and its designated CH for the Beech Creek On/Off Allotment. The conclusion was that the effects to the indicators that were measurable, do not meet the definition of “insignificant” effects. They are not “discountable” because the effects are likely to occur.

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