Decision Notice

& Finding of No Significant Impact

Westside Allotments

USDA Forest Service
Paulina Ranger District, Ochoco National Forest
Crook and Wheeler Counties, Oregon

Decision and Reasons for the Decision

Background

The Paulina Ranger District, Ochoco National Forest, is proposing to authorize livestock grazing for the Deep, Derr, Happy, Little Summit, and Roba Cattle Allotments. These allotments are located approximately 65 miles east of Prineville, Oregon along the north, south and western boundaries of the district in Wheeler and Crook Counties. The project area includes 83,027 acres of which 987 acres are private and 82,040 acres are National Forest System lands. Management direction applies only to National Forest Systems lands within the project area and is described on pages 10-11 of the environmental assessment (EA).

The purpose of this proposed action is to continue authorization of livestock grazing in a manner that is consistent with the goals and objectives of the Ochoco National Forest Land and Resource Management Plan (LRMP). In addition, Section 504 (a) of the Rescission Act of 1995 (Public Law 104-19) requires the Forest Service to establish and adhere to a schedule for completion of National Environmental Policy Act (NEPA) analysis and decision on all allotments. Authorization is needed on these allotments because:

> Where consistent with other multiple use goals and objectives, there is Congressional intent to allow grazing on suitable lands. *(Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Wild and Scenic Rivers Act 1968, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976)*
>
> Federal regulation provides that lands producing forage will be managed for livestock grazing where consistent with land management plans **(Title 36 of the Code of Federal Regulations (CFR) 222.2 (c)).**
>
> The allotments contain lands identified as suitable for domestic livestock grazing in the Ochoco National Forest LRMP. Continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the Ochoco National Forest LRMP (pages 4-111 to 4-112 and 4-139 to 4-147).
>
> It is Forest Service Policy to make forage available to qualified livestock operators on lands suitable for grazing consistent with land management plans **(Forest Service Manual (FSM) 2203.1).**

> It is Forest Service policy to continue contributions to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood **(FSM 2202.1).**

The need for the proposed action was determined by comparing the differences between current conditions and desired resource conditions. There is a need to improve resource conditions within the Deep, Derr, Happy, Little Summit, and Roba Allotments. Our analysis indicates there are areas within these allotments that are not equal to the desired conditions identified in the LRMP (pages 4-1 to 4-118), the EA (pages 5-10), and the Deep Creek Watershed Analysis (pages 72 to 74). In some areas the existing conditions are different from desired conditions identified in the LRMP; this difference helps define the need for resource changes. In instances where current conditions equal desired conditions the resource need is to maintain these conditions in the future. The environmental assessment documents the analysis of three alternatives to meet this need.

Decision

Based upon my review of all the alternatives, I have decided to implement Alternative 2, the Proposed Action Alternative. Alternative 2 permits livestock grazing with specific management standards, mitigation measures, and monitoring requirements. Alternative 2 is designed with an adaptive management strategy to achieve desired conditions (EA, pages 5-10). Management standards would be set on a pasture-wide basis based on resource conditions determined by existing and future monitoring. Changes in management standards and practices would be made to meet the purpose and need for action (EA, pages 3-5) and to address the issues identified through the scoping process (EA pages 14-18). For a more detailed description of Alternative 2 and the mitigation measures and monitoring requirements associated with this alternative refer to pages 23-35 of the EA.

Rationale for the Decision

The purpose of this project is two fold: there is a need to continue the authorization of livestock grazing and to do so in a manner that is consistent with the goals and objectives of the Ochoco National Forest Land and Resource Management Plan (LRMP). Congress has made its intent clear through numerous acts and public laws regarding grazing use of suitable lands within National Forests (see page 3 of the EA and paragraph above). Alternative 2 complies with these acts and laws by authorizing domestic livestock grazing under the Forest Service permit system. Livestock grazing authorized under the Forest Service permit system is to be managed in such a way as to comply with direction within federal regulations and approved land management plans. The Ochoco LRMP outlines management standards for livestock grazing intended to maintain or improve resource conditions equal to the desired condition. Alternative 2 would comply with the LRMP by implementing management standards that are consistent with or more restrictive than standards in the LRMP. Site-specific standards would apply to pastures based on the relative health of soil and vegetation resources as determined by long term (effectiveness) monitoring.

I believe that Alternative 2 provides the best approach for fulfilling the purpose and need for this project in two ways. First and quite simply, it allows for livestock grazing. Actual use each year would be based on the effectiveness of livestock management and climatic conditions. Experience has taught us that it is not unusual for permittees to use allotments at less than

authorized levels due to climate and other reasons. Under Alternative 2, use on the Roba Allotment would be reduced to allow for improvement of resource conditions by resting it from grazing for three years. This rest is intended to provide the best opportunity for successful improvement in resource conditions and treatment of the invasive weed houndstongue. Rest will be implemented during a consecutive three year period coinciding with the use of weed control methods, but no later than two years following the date of my decision. Permitted numbers and seasons on the remaining allotments would not change unless allowable use levels are reached before the end of the grazing season, in which case the level of actual use would be less than the permitted use. My decision will not preclude needed changes in authorized use based on administrative actions as outlined in Forest Service policy. In either case, livestock use would continue as intended by Congress.

Second, Alternative 2 provides for maintained or improved resource conditions in riparian and upland ecosystems consistent with the LRMP. It fulfills this purpose for the project in at least three ways. First, the levels of allowable use and management standards vary depending on the overall level of functionality of a pasture. In short, the intensity of use is adapted to meet the ability of the resources to support the use and sustain or improve functionality. Pastures that are fully functional can be used at levels that will ensure maintenance of this condition. Pastures and allotments that are functioning at risk or non-functioning will be used at reduced levels of forage removal and physical impacts than are currently permitted, including complete rest if needed. These standards will allow sites to improve to a level that is properly functioning, and able to withstand natural events and perturbations. Second, specific mitigation measures outlined in the EA on pages 31-32 would contribute to improved resource conditions. These measures are designed to minimize or offset the impacts associated with the presence and concentrations of livestock in an area. The intensity of impacts on soil and vegetation is increased when livestock congregate in an area for shade, water, or dietary supplements such as salt. The mitigation measures are designed to offset impacts from grazing use to riparian and upland soil and riparian resources, heritage resources, wildlife and fish species, and invasive weed proliferation.

The third way that Alternative 2 provides for improved resource conditions is by implementing monitoring standards to determine the level of functionality of a pasture used. Effectiveness monitoring results will be used to set the levels of allowable use or management standards needed to maintain or improve resources. Monitoring will also be used to identify impacts of grazing on sensitive species, weed populations, and heritage resources. Specific monitoring actions will provide responsive and timely information that will be used to modify livestock grazing practices using the adaptive approaches in the management standards and mitigation measures. The twofold approach to monitoring, implementation and effectiveness monitoring, will provide monitoring tools to determine if annual use standards are applied correctly as planned. They will also provide the information needed to determine if the annual standards are achieving the desired conditions as revealed through effectiveness or long term monitoring.

I did not choose Alternative 1 - No Grazing, because it would not meet the purpose for the project to provide for continued livestock grazing. There are areas suitable for livestock grazing within the project area that are in acceptable condition; they are equal to the desired condition described in the LRMP and the EA on pages 5-10. Elimination of grazing use when monitoring data indicates resource conditions are in agreement with the LRMP would not be appropriate and would conflict with existing Congressional acts and public laws, regulations, and policies. I did not choose Alternative 3 - Current Allotment Management, because there are numerous areas

within the project area that have not improved to the desired conditions outlined in the LRMP as expected. These areas need different management than has been applied in order to improve the level of functionality and sustain basic soil and vegetation resources.

Other Alternatives Considered

In addition to Alternative 2, I considered two other alternatives. A comparison of these alternatives can be found in the EA on pages 44-47.

Alternative 1 – No Action/No Grazing

Under the No Action Alternative, all Term Grazing Permits would be cancelled within two years of implementation of the decision. The requirement to implement this decision no sooner than two years following the project decision is pursuant to Forest Service Handbook (FSH) 2209.13 part 16.24, and the Code of Federal Regulations (36CFR 222.4 (4) (1)). It is in effect an economic mitigation measure directed by policy and regulation. No permits would be issued for any of the five affected allotments unless a subsequent NEPA decision to re-stock any or all of the allotments was made. Since there would be no livestock grazing under this alternative, no mitigation measures would be implemented related to the effects of livestock on physical and biological resources.

Alternative 3 – Current Allotment Management

Alternative 3 reflects current management of the five allotments. Livestock grazing would be permitted under the Forest Service livestock permit system. The allotments would be managed according to the standards and criteria established in the LRMP, Allotment Management Plan, Annual Operating Provisions, and the Term Grazing Permit.

The allotments would be monitored throughout the grazing season for stubble height, streambank alteration, and woody species utilization. Annual Operating Provisions (numbers and seasons of use) would be adjusted in response to the previous years monitoring results and expected climatic conditions for the upcoming grazing season. Allotments failing to meet standards would have annual adjustments in livestock numbers, season of use, and non-use on pastures with serious noxious weed concerns.

Cattle actively graze all of these allotments under current term grazing permits. Deep Creek and Roba Allotments have been administered jointly as one allotment since 1995 in order to improve rider efficiency and livestock distribution. For a more detailed description of Alternative 3 and the mitigation measures and monitoring requirements associated with this alternative refer to pages 35-43 of the EA.

Public Involvement

Various efforts were made to involve the public and solicit comments to the proposed action. In December of 2003 a scoping letter was mailed to 102 members of the public, tribes, and other agencies for comment; six responses were received and are included in the analysis file at the district office. Members of the Forest Service Interdisciplinary Team (IDT) met with the grazing permittees authorized to use the five allotments within the Westside Analysis Area in December of 2003. The proposal was listed in the Deschutes and Ochoco National Forests and Prineville

District, BLM Winter 2004, Spring, 2004, Summer 2004, Fall 2004, Winter 2005, Spring 2005, and Summer 2005 Schedule of Proposed Actions. The Forest Service ID Team hosted a public meeting in January 2004, in Paulina, OR. Forest Service employees were available to explain the project and answer questions. No one from the public attended this meeting. The 30-day review and comment period was initiated in January of 2005. The purpose of the comment period was to provide the public, tribes, and other agencies the opportunity to comment on the proposed action and alternatives to the proposed action prior to a decision being made. Nine responses were received and are included in the analysis file at the district office and are addressed throughout the EA and in Appendix E of the EA.

Using the comments from the public and other agencies (see *Issues* section), the interdisciplinary team identified several issues regarding the effects of the proposed action. Main issues of concern included impacts to riparian and upland vegetation, impacts to riparian and upland soils, and noxious weeds (EA pages 14-15). To address these concerns, the Forest Service created the alternatives described above.

Additionally, the interdisciplinary team and individuals responding during the scoping process identified several other concerns described on pages 16 to 18 of the EA. Heritage resources, proposed, endangered, threatened, and sensitive plant, animal, and fish species, management indicator species, land birds including migratory species, other wildlife species, social and economic values, 303 (d) listed streams, and the North Fork Crooked Wild and Scenic River were determined to be important to the project but did not contribute to alternative development. However, they did contribute to mitigation measures that apply to the action alternatives and are tracked through the analysis process (EA, pages 49-196 and the analysis file).

Finding of No Significant Impact

After considering the environmental effects described in the EA, I have determined that these actions will not have a significant effect on the quality of the human environment considering the context and intensity of impacts (40 CFR 1508.27). Thus, an environmental impact statement will not be prepared. I base by finding on the following:

1. My finding of no significant environmenal effects is not biased by the beneficial effects of the action. Beneficial and adverse effects on the human environment associated with Alternative 2 are discussed in the EA and were analyzed independently. None of the effects were identified as "significant". Impacts to Riparian and Upland Vegetation (pages 49- 67); Impacts to Riparian and Upland Soils (pages 68-77); noxious weeds (pages 77-93); Heritage Resources (pages 93-97); Proposed, Endangered, Threatened, Sensitive (PETS Plant, Animal, and Fish Species, pages 98-152); Management Indicator Species (pages 152-159); Other Wildlife Species (pages 159 to 168); Social and Economic Values (pages 169-172); 303 (d) Listed Streams (pages 172-182); North Fork Crooked River Wild and Scenic River (pages 183-193); Additional Disclosures including Tribal Interest, Environmental Justice,Civil Rights, Women and Minorities, Prime Farmland, Rangelands, and Forestlands, Wetlands and Floodplains, and Park Lands, Wild and Scenic Rivers, and Ecologically Critical Areas (pages 194-196).

2. Based on the results of scoping (EA, page 14 and the analysis file) there were no issues identified related to public heatlth and safety. There are no known significant adverse effects on public health and safety associated with Alternative 2.

3. There will be no significant effects on roadless areas, parklands, or prime farmlands because there are none in the planning area (EA, page195-196). Surveys have been conducted for cultural and historic resources and mitigation and monitoring requirements to protect know sites are identified in the EA on pages 32 and 35. Additionally, the design criteria, mitigation measures, and monitoring requirements included in Alternative 2 conform to those federal laws and guidelines for the protection of National Register of Historic Places eligible sites (EA, page 97). The effects of implementing Alternative 2 on the Nork Fork Crooked Wild and Scenic River are discussed on pages 183 to 193 of the EA. In summary Alternative 2 would improve the riparian and vegetation conditions and the designated Outstandingly Remarkable Values of the North Fork Crooked Wild and Scenic River and would lead to resource conditions that meet the desired condition for the Wild and Scenic River Corridor outlined in Chapter One of the EA (EA, pages 187-188). There are numerous wetlands associated with the streams in the project area. Alternative 2 is designed to improve wetlands in both the short-term and the long-term (EA, pages 175-179 and 178-180) and conforms to Executive Order 11990 EA, page 195).

4. The effects on the quality of the human environment are not likely to be highly controversial. The degree to which possible effects on the human environment are likely to be highly contoversial was determined through public and internal scoping. As described in Chapters One (EA, page 14) and Four (EA, pages 197-199), scoping efforts included a series of mailings, EA review procedures, and a public meeting with agencies organizations, and individuals. Comments were incorporated into the EA where appropriate and are summarized in Appendix E. Although, it has become customary for some commentors to provide their own scientific advice, the analysis is based on information provided through the Ochoco National Forest Land and Resource Management Plan as amended, National Forest Policy and Direction, and other documents and direction described on pages 3, 13, and the bibliography of the EA.

5. The analysis does not create a situation where the possible effects on the human environment are highly uncertain or involve unique or unknown risks as discussed in the Chapter Three of the EA, pages 49-196 and the analysis file. Cattle grazing is a common practice on the Paulina Ranger District and the Ochoco National Forest and has been since the 1880s (EA, Appendix A). The EA effectively addresses and analyzes issues and environmental impacts specifically associated with this project.

6. Analysis indicates the actions associated with Alternative 2 will not result in significant adverse effects (EA, pages 49-196 and the analysis file) and do not establish a precedent for future actions with significant effects nor does this decision represent a decision in principle about future considerations. Future projects within the area or in surounding areas will be analyzed on their own merits and implemented, or not, independent of the actions currently selected.

7. There are no known significant cumulative or secondary effects due to this project with other projects implemented or planned for the forseeable future. Effects to the human environment (Riparian and Upland Vegetation, pages 49- 67; Riparian and Upland Soils, pages 68-77; Noxious Weeds, pages 77-93; Heritage Resources pages, 93-97; Proposed, Endangered, Threatened, Sensitive (PETS Plant, Animal, and Fish Species, pages 98-152; Management Indicator Species, pages 152-159; Other Wildlife Species, pages 159-168; Social and Economic Values, pages 169-172; 303 (d) Listed Streams, pages 172-1182; North Fork Crooked River Wild and Scenic River, pages 183-193; Additional Disclosures including Tribal Interest, Environmental Justice,Civil Rights, Women and Minorities, Prime Farmland, Rangelands, and Forestlands, Wetlands and Floodplains, and Park Lands, Wild and Scenic Rivers, and Ecologically Critical Areas, pages 194-196) were estimated and determined to be localized. This determination is based on the cumulative effects analysis discussed in the EA, which considered past, existing, and proposed activities. Furthermore, the cumulative effects analysis follows the guidance provided in the Council of Environmental Quality (CEQ) Memorandum titled Guidance On The Consideration Of Past Actions In Cumulative Effects Analysis issued on June 24, 2005 (EA, page 49).

8. The action will have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. The design criteria, mitigation measures, and monitoring requirements included in Alternative 2 conform to those Federal laws and guidelines for the protection of National Register of Historic Places eligible sites (EA, pages 23-35 and 96-97). Additionally, under the adaptive management strategy, monitoring would aid in the identification and assessment of livestock damage to archaeological sites.

9. Biological evaluations for threatened, endangered, and sensitive plants, wildlife, and fish species were completed for the project area. The activities proposed under Alternative 2 resulted in determinations of No Effect or Not Likely to Adversely Affect to threatened or endangered species or its habitat that has been determined to be critical under the Endangered Species Act (40 CFR 1508.27(b)(9). Several plant, fish, and wildlife species on the Regional Forester's Sensitive Species list are known to occur or have habitat adjacent to the project area (EA, pages 98-152). The determination of effects for these species was Beneficial Impact, No Impact, or May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability of Habitat (EA, Appendix D). These determinations did not trigger a significant action as defined under the National Environmental Policy Act. Complete Biological Evaluations for plants, fish, and wildlife are included in the analysis file.

10. The action will not violate Federal, State, and local laws or requirements for the protection of the environment (40 CFR 1508.27(b) (10). Applicable laws and regulations were considered in the analysis (EA, pages 3, 13, 194-195). The activities proposed under Alternative 2 are consistent with Forest Plan direction, as amended, which has been found to be consistent with existing environmental statues and regulations. Forest Plan consistency is discussed throughout Chapter Three of the EA when Forest Plan standards are applicable to a specific resource area.

Findings Required by Other Laws and Regulations

Federal regulations (36 CFR 219.10(e) require that permits, contracts, cooperative agreements, and other activities carried out on the Paulina Ranger District are consistent with the Ochoco National Forest Land and Resource Management Plan and accompanying Final Environmental Impact Statement and Record of Decision dated August 1, 1989 as amended by the Regional Forester's Forest Plan Amendment #2 (6/95) and PACFISH/INFISH. Accordingly, I have reviewed my decision against Forest Plan direction, and I have determined that Alternative 2 complies with Forest Plan direction, including both Management Area (LRMP, pages 4-45 to 4-118) and Forest-wide standards and guidelines (LRMP, pages 4-119 to 4-266). Furthermore, the adaptive management strategy proposed under Alternative 2 is designed to move towards the desired conditions for riparian vegetation and streambanks, stream channels and water quality, upland vegetation, rangelands, soils, North Fork Crooked River Wild and Scenic River, Noxious Weeds, Threatened, Endangered, and Sensitive species, management indicator species, and other wildlife species described in the LRMP on pages 4-45 to 4-118 and the EA on pages 5-10.

There are no known impacts to Native American treaty rights (EA, pages 87, 88, and 181).

Based on the results of scoping (EA, pages 14 and 197 – 199 and the analysis file), there were no issues identified related to women, minority groups, or civil rights. There are no known direct or adverse effects on women, minority groups, or civil rights (EA, page 195).

Under Alternative 2 current uses of National Forest lands would continue, including recreation, harvesting of non-forest products, special-use permits, subsistence uses, and spiritual/aesthetic uses.

This decision is in compliance with Executive Order 12989 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Effects to minority populations, disabled persons, and low income groups would not be disproportionate with other users of the National Forest (EA, pages 194-195). Alternative 2 will provide an opportunity for employment EA, pages 169-172. This opportunity to support employment and income would be available to all groups of people. Opportunities for all groups of people to collect forest products and participate in recreational activities would be maintained under Alternative 2, and no disproportionate effect is anticipated to subsets of the general population. Alternative 2 would not have disproportionately high and adverse environmental effects on minority populations, low-income populations, or Indian tribes.

Alternative 2 complies with the provisions of 36 CFR 219.14 (f) (2005) which address Management Indicator Species. The effects to Management Indicator Species, including steelhead and redband trout, pileated woodpecker, northern flicker, the red-naped sapsucker and the downy and Lewis' woodpecker, are discussed on pages 129 to 159 of the EA. In summary, Alternative 2 would meet Forest Plan standards for Management Indicator Species and their habitats would be maintained and improve over time.

Implementation Date

If no appeals are filed within the 45-day time period, implementation of the decision may occur on, but not before, 5 business days from the close of the appeal filing period. When appeals are filed, implementation may occur on, but not before, the 15th business day following the date of the last appeal disposition.

Administrative Review or Appeal Opportunities

This decision is subject to administrative review (appeal) pursuant to 36 CFR Part 215. Any written notice of appeal of this decision must be fully consistent with 36 CFR 215.14, "Appeal Content." Individuals or organizations who submitted substantive comments during the comment period specified at 215.6 may appeal this decision. The notice of appeal must be filed hard copy with Appeal Deciding Officer, Kathryn J. Silverman, Acting Ochoco National Forest Supervisor, ATTN: 1570 APPEALS, 3160 NE 3rd Street, Prineville, Oregon 97751, faxed to (541) 416-6695, sent electronically to appeals-pacificnortwest-ochoco@fs.fed.us, or hand delivered to the above address between 7:30AM and 4:30PM, Monday through Friday except legal holidays. The appeal must be post marked or delivered within 45 days of the date the legal notice for this decision appears in the *Bend Bulletin newspaper.* Attachments received after the 45 day appeal period will not be considered. The publication date of the legal notice in the *Bend Bulletin newspaper* is the exclusive means for calculating the time to file an appeal and those wishing to appeal should not rely on dates or timeframes provided by any other source.

Electronic appeals must be submitted as part of the actual e-mail message, or as an attachment in Microsoft Word, rich text format, or portable document format only. In cases where no identifiable name is attached to an electronic message, a verification of identity will be required. A scanned signature is one way to provide verification. E-mails submitted to e-mail addresses other than the one listed above or in other formats than those listed or containing viruses will be rejected. It is the responsibility of the appellant to confirm receipt of appeals submitted by electronic mail. This project may be implemented 50 days after this legal notice if no appeal is received. If an appeal is received the project may not be implemented for 15 days after the appeal decision. Should this project be appealed the responsible official offers to meet with appellants to attempt to informally resolve the appeal on November 15, 2005 at 10:00 am at the Paulina Ranger District Office 7803 Beaver Creek Road, Paulina, Oregon.

Relative to issuance of the term grazing permits, permittees may choose to appeal under the regulations listed at 36 CFR 251, Subpart C. The permittee must select which administrative review regulation (36 CFR 215 or 251) they will opt to use, because they cannot use both for the same appealed decision. An appeal by the permittee under the 36 CFR 251 regulations must be filed simultaneously with the Reviewing Officer Acting Ochoco National Forest Supervisor Kathryn J. Silverman (address above) and the Deciding Officer Paulina District Ranger, Mike Lawrence, at 7803 Beaver Creek Road, Paulina, Oregon 97751 or fax: (541) 477-6949. The 45 day appeal period begins on the first day after the Deciding Officer's written notice of the decision.

Contact

For additional information concerning this decision or the Forest Service appeal process, contact Robert M. Crisler, Environmental Coordinator, Paulina Ranger District, 7803 Beaver Creek Road, Paulina, Oregon, and (541) 477-6900.

MIKE LAWRENCE
District Ranger
Paulina Ranger District

Date

USDA

United States
Department of
Agriculture

Forest
Service

September 2005

Environmental Assessment

Westside Allotments

Paulina Ranger District, Ochoco National Forest
Crook and Wheeler Counties, Oregon

Legal Description:

- **Crook County**

T.13S., R.22E., Sections 23 through 26, 35, and 36;
T.14S., R.22E., Sections 1, 2, 11 through 14, 23 through 27, 35 and 36;
T.14S., R.23E., Sections 1 through 36;
T.15S., R.22E., Sections 1 through 3, 9 through 16;
T.15S., R.23E., Sections 1 through 18;
Willamette Meridian

- **Wheeler County**

T.13S., R.22E., Sections 1, 2, 11 through 14;
T.13S., R.23E., Sections 1 through 36;
T.13S., R.24E., Sections 7, 18, 19, 30 through 32;
T.14S., R.24E., Sections 5 through 8, 16 through 21, 28 through 32;
Willamette Meridian

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(541) 477-6900
www.fs.fed.us/r6/centraloregon

Contents

Tables

Figures

Diagrams

Photographs

SUMMARY

The Ochoco National Forest proposes to continue authorization of grazing on the Deep Creek, Derr, Happy, Little Summit, and Roba Allotments. The project area is located within the Deep Creek watershed and portions of the Mountain Creek, Rock Creek, Paulina Creek, and lower North Fork Crooked River watersheds on the Paulina Ranger District, Ochoco National Forest, Oregon. This action is needed because management plans in place on the allotments are outdated.

The proposed action is expected to maintain rangelands in acceptable ecological status and improve sites that are not in acceptable ecological status as determined by monitoring of key riparian and upland sites (refer to the map of Alternative 2, Chapter Two).

In addition to the proposed action, the Forest Service also evaluated the following alternatives:

- No Grazing
- Current Management

Based upon the effects of the alternatives, the responsible official will decide whether or not to authorize grazing on the allotments within the Westside Analysis area. If the decision is to continue authorization of grazing then the responsible official will decide specific standards and guidelines that would be used with this action.

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CHAPTER ONE: PURPOSE AND NEED FOR ACTION

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. Currently, the document is organized into three parts:

Introduction: This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Comparison of Alternatives, including the Proposed Action: This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Background

Prior to 1995, questions existed over whether to consider a grazing permit a Federal action requiring review under the NEPA. Additional questions existed about the ability of the Forest Service to complete analyses for allotments where grazing permits were soon to expire. To resolve the issue, Congress approved legislation commonly known as the Rescission Act of 1995 (Public Law 105-19, Section 504), which required the Forest Service to identify all allotments needing analysis under the NEPA. Congress further required the Forest Service to prepare and adhere to a schedule for completing analysis on the identified allotments. Section 504(b) and (c) allows the Forest Service to issue expired and waived permits on allotments listed on the schedule that have not been through a NEPA analysis as long as the terms and conditions of the permits are not changed. In a reply to Congress, the Forest Service established a schedule to complete this work within 15 years (by the year 2010).

The Paulina Ranger District, Ochoco National Forest, is proposing to authorize livestock grazing for the Deep, Derr, Happy, Little Summit, and Roba livestock allotments. Brief summaries of past grazing use of these allotments are contained in Appendix A. These allotments are located approximately 65 miles east of Prineville, Oregon along the north, south and western boundaries of the district in Wheeler and Crook Counties. The project area includes 83,027 acres of which 987 acres are private and 82,040 acres are National Forest System lands. Management direction applies only to National Forest Systems lands within the project area. A legal description can be found on the title page of this document. The project is called the Westside Allotments Environmental Analysis Project.

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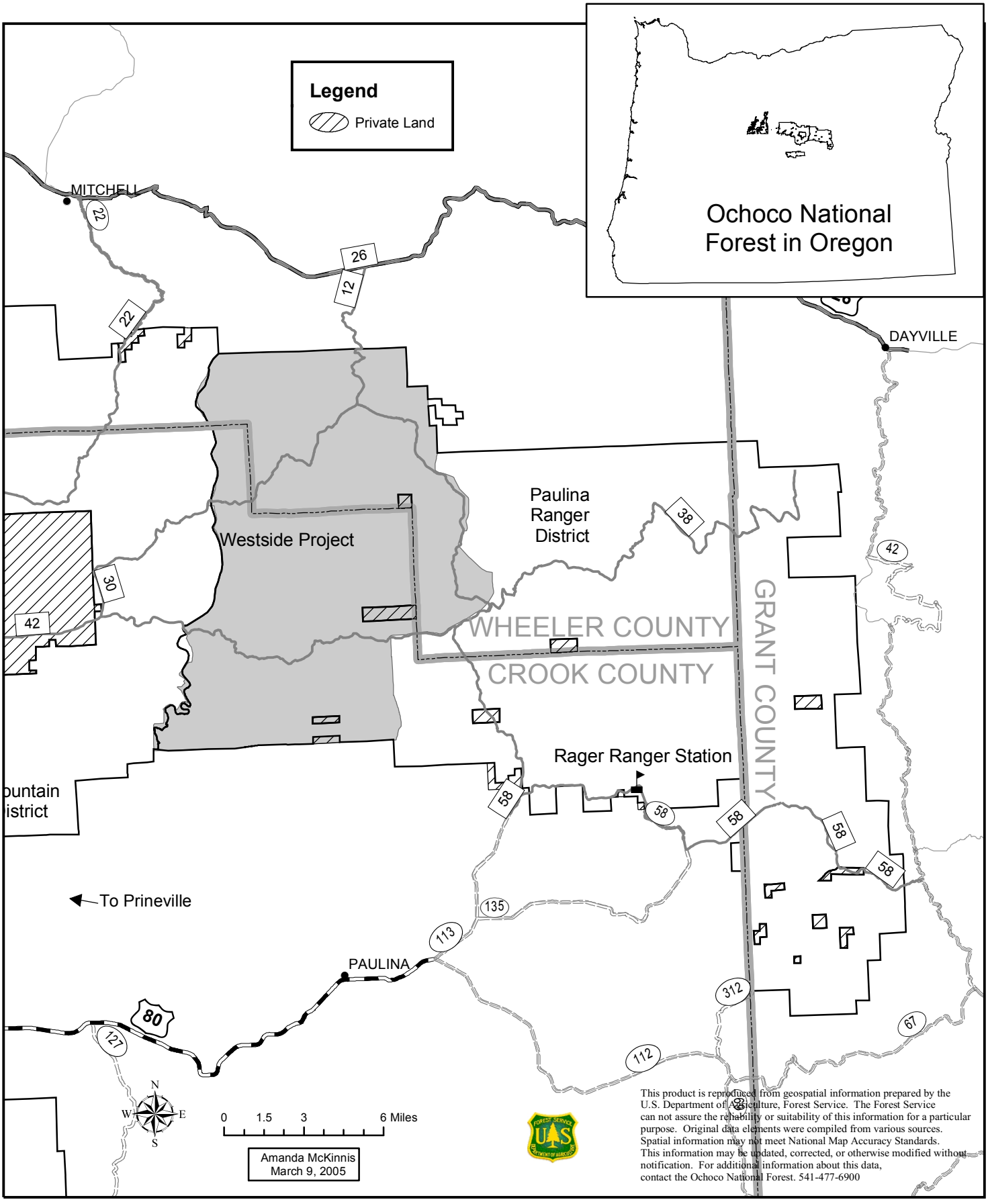
Figure 1. General location of the Westside Allotments Analysis Project
Paulina Ranger District, Crook and Wheeler Counties, Oregon



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Purpose and Need for Action

The purpose of this proposed action is to continue authorization of livestock grazing in a manner that is consistent with the goals and objectives of the Ochoco National Forest Land and Resource Management Plan (LRMP). Authorization is needed on these allotments because:

Where consistent with other multiple use goals and objectives there is Congressional intent to allow grazing on suitable lands. *(Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Wild and Scenic Rivers Act 1968, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976)*

Federal regulation provides that lands producing forage will be managed for livestock grazing where consistent with land management plans **(Title 36 of the Code of Federal Regulations (CFR) 222.2 (c)).**

The allotments contain lands identified as suitable for domestic livestock grazing in the Ochoco National Forest LRMP. Continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the Ochoco National Forest LRMP (pp. 4-111 to 4-112 and 4-139 to 4-147).

It is Forest Service Policy to make forage available to qualified livestock operators on lands suitable for grazing consistent with land management plans **(Forest Service Manual (FSM) 2203.1).**

It is Forest Service policy to continue contributions to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood **(FSM 2202.1).**

There is a need to improve resource conditions within the Deep, Derr, Happy, Little Summit, and Roba livestock and horse (C&H) allotments. Analysis indicates areas within these allotments are not moving toward desired conditions identified in the LRMP. Existing conditions are different from desired conditions (as identified in the LRMP on pages 4-1 to 4-118 and the Deep Creek Watershed Analysis on pages 72 to 74). This difference helps define the need for resource changes. In instances where current conditions equal desired conditions the resource need would be to maintain those conditions in the future. A comparison of the existing conditions with desired conditions indicates specific desired conditions are not being met as follows:

Riparian Plant Communities

Riparian plant communities are not in acceptable condition in portions of the project area. Riparian studies revealed these reaches have excess early seral to mid seral vegetation with heavy browsing on all age classes of riparian woody species.

- Deep Creek C&H Allotment - Big Spring Creek (about 1.0 mile) in the South Pasture; Deep Creek (about 7.0 miles) in the North and South pastures; Double Corral Creek (about 0.75 miles); Little Summit Creek (about 1.5 miles); Happy Camp (about 0.5 miles), and Jackson (about 2.5 miles) creeks in the North Pasture.
- Derr C&H Allotment - Jackson Creek (about 0.5 miles) and unnamed tributary of Jackson Creek (about 0.75 miles) in the East Pasture.

- Happy C&H Allotment - Haypress Creek (about 0.5 miles) in the East Pasture and Happy Camp Creek (about 1.0 miles) in the West Pasture.
- Little Summit C&H Allotment - Little Summit Creek (about 5.6 miles); Thorton Creek (about 2 miles), and an unnamed tributary of Jackson Creek (about 0.75 miles).
- Roba C&H Allotment - North Fork Crooked River (about 5.0 miles) in the Riparian pasture; Roba (about 4.0 miles) and Hewed Log Creeks (about 2.5 miles) in the Roba pasture; Dipping Vat Creek (about 4.0 miles) in the Dipping Vat pasture, Indian Creek (about 2.0 miles) in the West Pasture.

Upland Plant Communities

Upland plant communities are not in acceptable condition in portions of the project area. Condition and Trend (C&T) studies have found that vegetation and ground cover are in a less than desirable condition on the following sites:

- Derr C&H Allotment - Dry Meadow and Stiff Sage (Condition & Trend study #'s – 43, 47, 51, 57)
- Little Summit C&H Allotment - Stiff Sage (C&T #'s – 60, 66)
- Roba C&H Allotment - Stiff Sage (C&T #'s – 7, 15)

Soil and Streambank Stability

Studies on each of the allotments reveal that in some areas soil stability is poor. Streambank stability is not adequate to protect water quality in some locations within the project area. Ground cover is not adequate in some areas to protect soils from accelerated erosion. Proper utilization of forage and improved livestock distribution would facilitate improvement of soil stability on stream banks and upland sites.

- Deep Creek C&H Allotment - Big Spring Creek (about 1.0 mile) in the South Pasture; Deep Creek (about 7.0 miles) in the North and South Pastures; Double Corral (about 0.75 miles), Little Summit Creek (about 1.5 miles); Happy Camp (about 0.5 miles), and Jackson (about 2.5 miles) Creeks in the North Pasture.
- Derr C&H Allotment – Jackson Creek (about 0.5 miles) and unnamed tributary of Jackson Creek (about 0.75 miles) in the East Pasture.
- Happy C&H Allotment - Haypress Creek (about 0.5 miles) and moist meadow (C&T #'s 12/13) in the East Pasture; Happy Camp Creek (about 1.0 miles) in the West Pasture,
- Little Summit C&H Allotment - Little Summit Creek (about 5.6 miles); Thorton Creek (about 2 miles), and an unnamed tributary of Jackson Creek (about 1.5 miles)
- Roba C&H Allotment - North Fork Crooked River (about 5.0 miles) in the Riparian pasture; Roba (about 4.0 miles) and Hewed Log Creeks (about 2.5 miles) and Ponderosa pine/pinegrass communities (C&T #'s 25, 28) in the Roba Pasture; Dipping Vat Creek (about 4.0 miles) in the Dipping Vat Pasture; Indian Creek (about 2.0 miles), Grassland (C&T # 12) and Stiff Sage communities (C&T #15) in the West Pasture.

Noxious Weeds

Noxious weeds occur throughout the project area. Within the Happy, Deep, and Little Summit Allotments, noxious weeds are mostly confined to the road shoulders of major travel routes. Houndstongue is the most prevalent weed in the planning area with concentrations in the Roba

Allotment. The presence of houndstongue is believed to be the result of forest management practices. Its spread is the result of various activities that can carry seed to new locations including livestock grazing, wildlife, prescribed burning, machinery associated with stream restoration, forest practices, and recreational vehicles. Within the Roba Allotment, noxious weeds are found along roads, riparian areas and within disturbed upland plant communities. Specific areas include Roba Creek and its tributaries in the Roba Pasture, Dipping Vat Creek and its tributaries in Dipping Vat Pasture, Indian Creek, Hewed Log Creek, Paulina Creek, and Dry Paulina Creek in the West Roba Pasture.

Functional Class

A preliminary analysis was conducted for several resources of concern and a determination was made to classify each pasture as properly functioning, functioning-at-risk, or non-functioning. Monitoring data for riparian and upland vegetation, soil and streambank condition, noxious weeds, and stream survey information were collectively used to make this decision.

Table 1: Functional Class for Pastures within the Westside Allotments Environmental Analysis Project Area

Allotment	Pasture	Functional Class
Deep Creek	North	Functioning-At-Risk
	South	Functioning-At-Risk
Derr	East	Functioning-At-Risk
	West	Functioning-At-Risk
Happy	North	Properly Functioning
	East	Functioning-At-Risk
	West	Functioning-At-Risk
Little Summit	Little Summit	Functioning-At-Risk
Roba	Dipping Vat	Non-Functioning
	Riparian	Non-Functioning
	Roba	Non-Functioning
	West	Non-Functioning

The Desired Condition

The need for the proposed action was determined by comparing the differences between current conditions and desired resource conditions. Desired conditions for the allotments were derived from goals, objectives, and standards and guidelines identified in the Ochoco National Forest Land and Resource Management Plan, as well as public scoping and input from the interdisciplinary team. Desired conditions provide a future vision for the project area and can help develop management options for the allotments over time. Proposed actions within the Westside Allotments Project Area are designed to move resources towards the desired condition described below.

Riparian Vegetation and Streambanks

Riparian areas will develop and maintain a healthy cover of ground vegetation with a multistoried community of shrubs, hardwoods, and conifers where the potential exists. Most riparian areas will be in excellent condition (LRMP, page 4-6 and 4-12).

Streamside vegetation includes native and desired non-native plant communities that are diverse and productive, providing streambank stability, increased/longer water holding capacity and a decrease in rates of streambank erosion. Management will limit new areas of streambank disturbance and promote restoration measures to restore streambank stability.

Riparian areas are properly functioning and are managed to maintain this condition with no downward trends. Areas currently functioning-at-risk or non-functioning are managed so that they show an upward trend on an annual basis. Riparian plant communities will be utilized by livestock at levels that will allow sustained use without a decline in these communities (LRMP, page 4-12).

Stream Channels and Water Quality

The primary goal for all watersheds within the project area is the attainment of Oregon Department of Environmental Quality (DEQ) water quality standards, as well as Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) and Interim Inland Naïve Fish Strategy for the Intermountain, Northern, and Pacific Northwest Regions (INFISH) objectives for habitat at the earliest possible date. It is not only mandated by law but also ecologically desirable to maintain and restore channel form and flow regimes, increase channel stabilization, establish and expand appropriate riparian vegetation, increase large woody debris (LWD) levels, reduce stream temperatures, and to move streams toward their maximum potential condition. Stream channels that are in excellent condition can maintain a stable dimension, pattern, and profile such that, over time, channel features are maintained and the stream system neither aggrades nor degrades (Rosgen 1996). Additional information (such as empirical goals) on the desired future condition may be found in the Ochoco Land and Resource Management Plan, PACFISH and INFISH, the Interior Columbia Basin Ecosystem Management Project (ICBEMP), the Deep Creek Water Quality Restoration Plan, Deep Creek Watershed Restoration EA, Deep Creek Watershed Analysis, and the Keeton-Fry Watershed Analysis.

Upland Vegetation

Uplands will be managed to improve vegetation and soil conditions in order to provide a diverse and productive plant community while reducing erosion hazards. Down woody material will occur in such quantities that provide for long-term site productivity while adding to amounts of effective ground cover.

Upland plant communities will be utilized by livestock at levels that will allow sustained use without a decline in these communities (LRMP, page 4-12). All suitable range upland types will be in fair or good forage condition as defined in FSH 2209.21.

Rangelands

Rangelands reflect a diversity of multi-age native grasses, forbs, and shrubs. Management emphasis is on maintaining a diverse native plant community and protecting the soil resources. Encroachment by coniferous species onto non-forest plant associations will be limited. New infestations of noxious weeds are uncommon and existing infestations are declining. Livestock management will be such, that new negative impacts to the vegetation and soil resources will be limited. Range conditions will be good and forage production will be higher than at present due to improved range conditions (LRMP, page 4-12).

Soils

Management activities will not increase detrimental soil conditions (LRMP, page 4-29). Increases in vegetation and effective ground cover resulting from increased livestock management will lower soil

erosion rates. Areas currently not meeting desired conditions due to detrimental soil conditions will be rehabilitated to bring soil conditions within current standards and guidelines (LRMP, page 4-29 and 4-30).

North Fork Crooked River Wild and Scenic River

The North Fork Crooked River will be protected as a free-flowing river with a diverse, dynamic, sustainable ecosystem, ranging from wet prairies to basalt canyons. All future river management or activities occurring within its boundaries will maintain and enhance the outstandingly remarkable river values for which the river was designated, including scenic, wildlife, botanical, and recreational values (North Fork Crooked River Management Plan, April 1993).

Noxious Weeds

The desired future condition for noxious weeds is that well established infestations will be contained, and will be fewer in number. New infestations of less than 10 plants will be rare, and will quickly be detected and brought under control. Most established infestations will be confined to spotty locations along road corridors. The long-term desired future condition is for new infestations to be found only on road corridors and they will be small, isolated, and are the results of management practices, and will not be present after one year. Established infestations will not be apparent on the forest (LRMP Amendment #18 – Noxious Weeds, page 46).

Threatened, Endangered and Sensitive Species

The LRMP (LRMP 4-246) directs that Threatened and Endangered species be considered in land management activities as covered and regulated by the Endangered Species Act. The LRMP also directs that Sensitive Species identified by the Regional Forester be considered in land management activities for potential effects. Table 2 identifies Threatened, Endangered and Region 6 Sensitive Terrestrial Species for the Ochoco National Forest.

The desired condition for greater sage-grouse habitat in the analysis area is a habitat condition that provides for the needs of nesting and brooding sage-grouse. Nesting habitat will provide suitable overhead cover from sagebrush crowns and suitable screening cover provided by grasses and other litter from the previous year's growth (Connelly et al. 2004). Brooding habitat will consist of abundant succulent forbs in sagebrush communities and functioning wet meadow and riparian habitats with abundant succulent forbs communities (ibid.).

The desired condition for the gray flycatcher in the analysis area is a habitat condition that provides for breeding and summer habitat needs for this species. The gray flycatcher is dependent upon areas with tall sagebrush, bitterbrush, or mountain mahogany communities. They can occupy these communities within open forests of ponderosa and lodgepole pine. They also inhabit juniper woodlands with a well-developed sagebrush understory (Csuti et al., 1997). These habitats provide for nesting, roosting and foraging.

The desired condition for the Columbia spotted frog in the analysis area is a habitat condition that provides for needs of all life stages of the frog. Wetland habitat associated/dominated by herbaceous species such as grasses, sedges and rushes in the analysis area will provide breeding habitat; after breeding, adults often disperse into adjacent wetland and stream habitats (USDA 2003). Populations in the analysis area will be well connected with suitable habitat present along appropriate lengths of stream systems.

Table 2: List of Proposed, Threatened, Endangered, and Region 6 Sensitive Terrestrial Species for the Ochoco National Forest

Species	Listing	Presence in Analysis Area
Threatened and Endangered		
Northern Bald Eagle	Threatened	Confirmed
Region 6 Sensitive		
California Wolverine	Sensitive	Suspected
Pygmy Rabbit	Sensitive	Not Present (habitat)
Bufflehead	Sensitive	Not Present (habitat)
American Peregrine Falcon	Sensitive	Not Present (habitat)
Greater Sage-grouse	Sensitive	Confirmed
Upland Sandpiper	Sensitive	Not Present (habitat)
Gray Flycatcher	Sensitive	Suspected
Tricolored Blackbird	Sensitive	Not Present (habitat)
Columbia Spotted Frog	Sensitive	Confirmed

The desired future condition for sensitive plant species is that habitat for existing threatened, endangered, and sensitive species of plants will be available as needs are identified over time (LRMP, page 4-5). Viable populations will be maintained for all native plant species in habitats distributed throughout their geographic range on Forest Service administered lands (FSM 2670.22). Documented sensitive plant species within the Westside Allotments include: *Achnatherum hendersonii, Botrychium ascendens, B. crenulatum, B. minganense, B. montanum, B. pinnatum* and *Calochortus longebarbatus* var. *peckii.*

The improvement of stream and riparian habitat would benefit threatened steelhead and resident redband trout populations. It is desirable to maintain and expand fish populations in all life stages, including non-game and non-sensitive species such as sculpin and macroinvertebrates. Increased inter-watershed connectivity will improve overall population genetic fitness and enable these species to more easily withstand natural disturbances such as fires and "catastrophic" floods. No target population values exist for proposed endangered, threatened, and sensitive (PETS) species, although it is desirable to see all of these species removed from national and local lists by National Oceanographic and Atmospheric Administration (NOAA) Fisheries, the U.S. Fish and Wildlife Service, and the Regional Forester.

Management Indicator Species

The LRMP (LRMP 4-242) identifies management indicator species, as required by the National Forest Management Act, for the management of National Forest System lands. These species serve as indicators for a larger host of species and the potential for effects of management actions on National Forest lands. Table 3 identifies the management indicator species for the Ochoco National Forest.

The desired future condition for upland primary cavity excavators is sufficient dead wood habitat to provide 100 percent of potential population levels for these birds. This habitat is to be distributed across the landscape with no 40 acre block of forest devoid of habitat.

The desired future condition for riparian dependent primary cavity excavators is the presence and abundance of functioning hardwood communities, well distributed in the analysis area. Cottonwood and aspen communities are the primary focus but also include willow and alder communities. Large snags and foraging opportunities will be abundant and well distributed in the appropriate riparian habitats. Suitable habitat will provide for viable populations of cavity excavators dependent upon these habitats.

Table 3: Terrestrial Management Indicator Species for the Ochoco National Forest

Species	Presence
Pileated Woodpecker	Confirmed
Primary Cavity Excavators	Confirmed
Northern Flicker	Confirmed

Land Birds Including Migratory Species

In 2001, President Clinton signed Executive Order 13186 Sec. 3 (6) that states: "ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern." Focal species as identified in the Partners in Flight, Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (PIF Strategy) (Altman 2000) will be the focus of these analyses.

The desired future condition for land birds, including migratory species, is the presence and abundance of suitable habitats for a diversity of species that use the analysis area. Riparian, shrub-steppe, grassland, woodland and forested communities will provide diverse and functioning habitats for a range of species, including those identified in the PIF Strategy. The distribution and abundance of habitat will provide for the viability of these species in the analysis area and contribute towards large landscape viability goals for those species (ibid.).

Other Wildlife Species

The desired future condition for other wildlife species in the Ochoco National Forest is to provide for, manage, and improve wildlife habitats to maintain viable populations of existing native and non-native vertebrate species. Within the LRMP there are specific objectives, standards and guidelines for some of these other wildlife species. Specific objectives include management to obtain population levels for deer and elk through the management of road density and cover; providing habitat for old growth-associated wildlife species through the maintenance of old growth habitats; providing habitat for cavity-dependant wildlife through the retention of snags well distributed across the Forest; specific guidelines to provide

security for nesting raptors through seasonal restrictions and habitat preservation around nest and roost sites, and lastly, to provide emphasis for the maintenance of unique habitats.

Management Areas and Direction

The following is a summary of the Management Allocations (MA) associated with the project area as allocated in the LRMP (Figure 2, pg. 9):

MA-F6 Old Growth *(FP 4-58)* – Provide habitat for wildlife species dependent on old growth stands (1,807 acres or about 2% of the project area).

MA-F7 Summit National Historic Trail *(FP 4-60 to 4-61)* – Protect the existing integrity of the Summit Trail. Enhance and interpret significant segments for public enjoyment and education. Pristine segments will be managed to protect, interpret, and preserve their historic qualities (1,969 acres or about 2% of the project area).

MA-F13 Developed Recreation *(FP 4-71)* – Provide safe, healthful, and aesthetic facilities for people to utilize while they are pursuing a variety of recreational experiences within a relatively natural outdoor setting (85 acres or less than 1% of the project area).

MA-F15 Riparian *(FP 4-74 to 4-75)* – Manage streamside vegetation and habitat in order to maintain or improve water quality and meet stream temperature and turbidity levels as required by state standards under the Clean Water Act (2,241 acres or approximately 3% of the project area). PACFISH/INFISH offers additional direction for management options for inland native fish and anadromous fish, by reducing the risk of loss of populations and reducing potential negative impacts to aquatic habitat..

MA-F19 Deep Creek Recreation Area *(FP 4-81)* – Provide a near natural setting for recreational pursuits within the area where management activities are not visually evident (759 acres or about 1% of the project area).

MA-F20 Winter Range *(FP 4-81)* – Manage for big game winter range habitat (7,145 acres or about 9% of the project area).

MA-F22 General Forest *(FP 4-86 to 4-87)* – Produce timber and forage while meeting the Forest-wide Standards and Guidelines for all resources. In ponderosa pine stands, management will emphasize production of high value (quality) timber (65,031 acres or about 78% of the watershed).

MA-F24 North Fork Crooked River Scenic Corridor *(FP 4-90 to 4-91)* – Management will maintain and enhance the natural appearing landscape and protect the scenic river designation (331 acres or less than 1% of the watershed).

MA-F26 Visual Management Corridors *(FP 4-94 to 4-95)* – Maintain the natural appearing character of the Forest along major travel routes, where management activities are not evident or are visually subordinate to the surrounding landscape (2,672 acres or approximately 3% of the watershed).

Private Land – There are 987 acres of private land within the project area (less than 2%).

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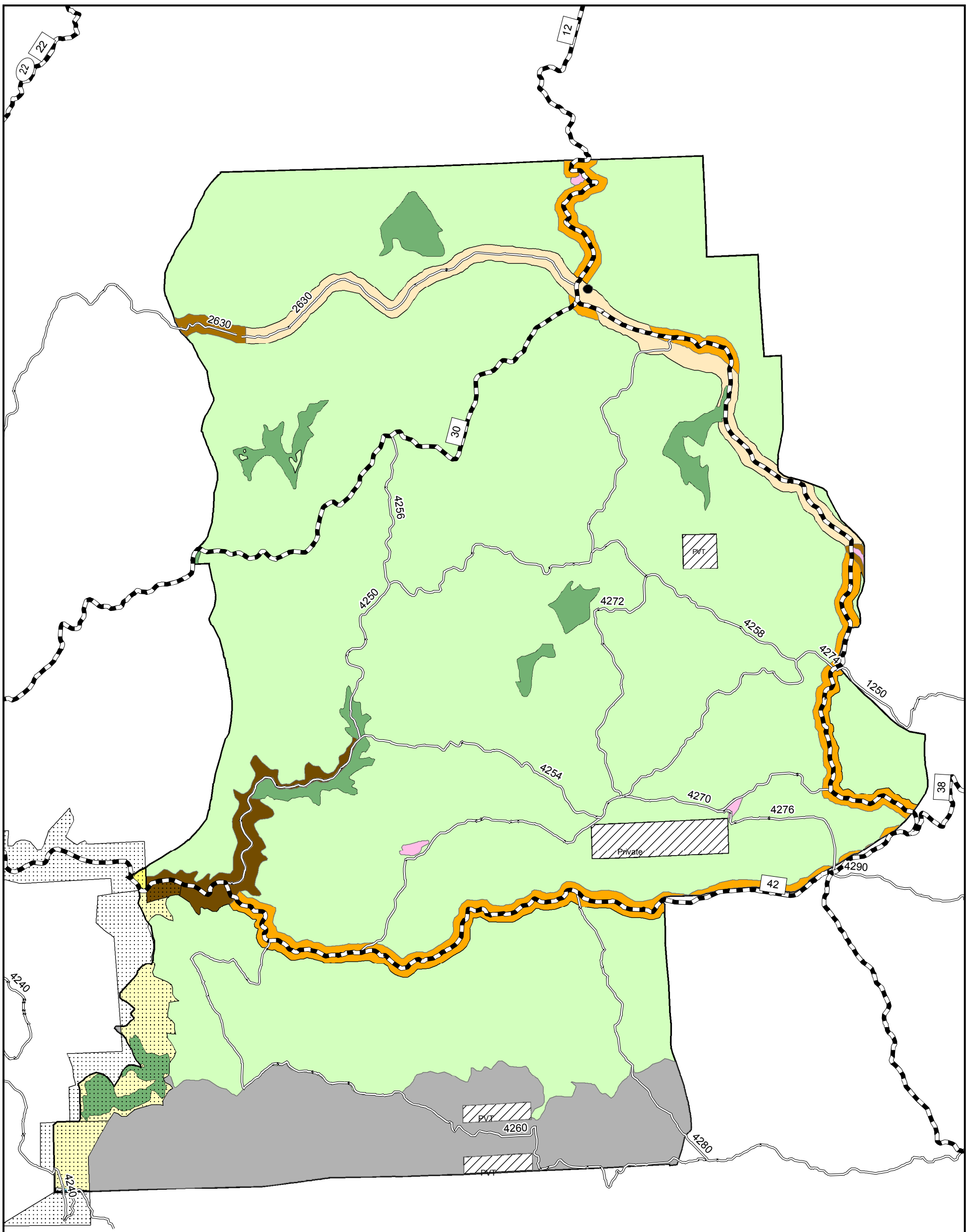

Figure 2 - Westside Allotment Analysis Project Management Areas

Amanda McKinnis
September 15, 2005

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Legend

- Private Land
- Wild and Scenic River Corridor

DESCRIPTIO

- Deep Creek Recreation Area
- Developed Recreation
- General Forest
- North Fork Crooked River Recreation Corridor
- North Fork Crooked River Scenic Corridor
- Old Growth
- SUMMIT TRAIL PARTIAL VISUAL RETENTION CORRIDOR
- Summit Trail Visual Retention Corridor
- USGS Snow Course Monitoring Points
- Visual Management Corridors (Partial Retention)
- Winter Range
- Riparian Habitat Conservation Areas

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Proposed Action

The Paulina Ranger District, Ochoco National Forest, is proposing to continue the authorization of livestock grazing in the Westside Allotments Project Area under new grazing management direction. Standards and strategies are proposed to help the Forest improve rangeland condition in ecologically important vegetation communities across the project area over the life of this analysis. These standards and strategies are described in more detail in Chapter Two under the Proposed Action. In the Proposed Action, grazing management standards and strategies are proposed that would maintain resources that are functional, and improve those resources that are either functioning-at-risk or non-functioning. If a determination is made that adjusting livestock grazing standards and/or strategies in an area can improve the environmental condition of a specific vegetation community within an allotment, those adjustments would be made in partnership with the given permittee and implemented under the existing term grazing permit until vegetative conditions are improved.

The proposed action is designed with an adaptive management strategy to achieve desired conditions based on changed resource conditions or management needs to meet the purpose and need for action. As more information is developed from project monitoring, further adjustments to management are anticipated to achieve and/or maintain progressive attainment of project objectives. Administration of the Terms and Conditions of grazing permits (adjustments in season of use, permitted or authorized numbers, allowable use standards, etc.) would be based on monitoring findings.

Documents Tiered To

This EA tiers to and relies upon the analysis in the Final Environmental Impact Statement (FEIS) for the Ochoco LRMP (1989), as amended. Amendments include but are not limited to the Regional Forester's Eastside LRMP Amendment #1 (1994), Screens; Amendment #2 (1995), Amendment of Screens; Amendment #3 (1994), PACFISH; Amendment #4 (1995), INFISH; The North Fork Crooked River Management Plan (1993); and Amendment #18 (1995), Noxious Weeds. These analyses are documented in the FEIS and Record of Decision for the LRMP, and the environmental analyses and Decision Notices for PACFISH and INFISH, and the Interim Management Direction Establishing Riparian Ecosystem and Wildlife Standards, and project specific resource reports prepared for this analysis (analysis file).

The following documents are incorporated by reference throughout this environmental assessment: the Deep Creek Watershed Analysis (1999), the Joint Aquatic and Terrestrial Programmatic Biological Assessment for Federal Lands within the Deschutes and John Day Basins (2004), and the Deep Creek Watershed Water Quality Restoration Plan (2001).

Decision Framework

The Responsible Official for this proposal is the Paulina District Ranger. Several decisions will be made from this environmental assessment. The District Ranger will decide whether or not to continue to authorize livestock grazing on the allotments within the Westside Allotments Environmental Analysis project area. If the District Ranger decides to authorize continued livestock grazing, the decision will include determining how the grazing resources are to be managed to best meet the goals of the LRMP and meet the purpose and need for the project. The decision will address whether to implement the project as proposed, to implement the project in a modified fashion, or not to implement the project at all. The District Ranger will decide if implementation of the Proposed Action or alternatives to the Proposed Action would cause significant effects requiring analysis in an environmental impact statement. That

determination will be based on context and intensity, and weighing the significance of the actions *(40 CFR 1508.27)*.

Public Involvement

Various efforts were made to involve the public and solicit comments to the proposed action. In December of 2003 a scoping letter was mailed by the Paulina Ranger District to 102 members of the public, tribes, and agencies for comment; six responses were received and are filed in the project record at the district office. Members of this project's Forest Service Interdisciplinary Team (IDT) met with the grazing permittees authorized to use the five allotments within the Westside Analysis Area in December of 2003. The proposal was listed in the Deschutes and Ochoco National Forests and Prineville District, Bureau of Land Management (BLM) Winter 2004, Spring 2004, Summer 2004, and Fall 2004 Schedule of Proposed Actions. The Forest Service IDT hosted a public meeting in January of 2004 in Paulina, OR. Forest Service employees were available to explain the project and answer questions. No one from the public attended this meeting.

Issues

This section identifies the issues associated with implementing the proposed action. The Forest Service interdisciplinary team identified preliminary issues prior to requesting input from the public. Significant and non-significant issues were identified from the preliminary list of issues identified by the Forest Service and responses received from the public. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, LRMP, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" A list of non-significant issues and reasons regarding their categorization as non-significant are included in the analysis file.

The public's response to the proposed action reflected and reinforced significant issues identified by the interdisciplinary team. These issues were grouped into similar themes for a total of three issues. Following is the list of significant issues and the associated measurement indicator. Measurement indicators are properties that change in response to management, climate, or both and reflect the current functional status. For each of the associated indicators, the given unit of measure will be used to compare the effects of each alternative on the significant issues.

Issue # 1: Impacts to Riparian and Upland Vegetation

The Westside Allotments Environmental Analysis project area contains a number of riparian and upland areas and their associated plant communities. Livestock grazing can reduce or eliminate certain species leading to a decline in vegetative diversity. Vegetation attributes can be described in the following terms:

- Composition (variety and amount of different plant species),
- Cover (amount of soil covered or protected by desirable vegetation), and
- Structure (height, width, and density of plants within the plant community).

Livestock grazing can affect the vegetative quality and quantity, which in turn affects the overall health of rangeland and aquatic systems.

Measures

Species composition of vegetation including recruitment of young woody plants (percent of plants that indicate the plant community is functioning as desired).

Bare ground (percent)

Issue # 2: Impacts to Riparian and Upland Soils

Livestock have the potential to directly harm soil quality by compacting soils and indirectly by consuming or trampling vegetation that protects and helps form soils. Compaction reduces water infiltration and storage that may lead to increased overland flows and "flashier" runoff patterns in streams. Compaction can physically restrict root growth and reduce nutrient availability. A loss of vegetation results in bare ground that is more susceptible to water and wind erosion, has increased runoff following precipitation events, and has less organic matter available for nutrient cycling.

Measures

Trampling damage (percent)

Streambank alteration (percent of unnatural alteration)

Bare ground (percent)

Issue #3: Noxious Weeds

Noxious weeds are indicators of unsatisfactory range condition and are often associated with disturbed sites where livestock grazing is heavy and native vegetation has been affected. Livestock can cause openings in plant communities through trampling, and can reduce the vigor, cover, and species composition of native plant communities. Openings and altered plant communities may allow the establishment and spread of weeds within the planning area such as houndstongue, whitetop, teasel, spotted knapweed and medusahead rye. Livestock can also transport noxious weed seed in their gut, hair, and hooves, increasing the potential for new weed infestations. Once established, noxious weeds often out-compete native plant species, thus reducing the productivity of rangelands.

Measures

Potential for noxious weed spread

Table 4: Summary of Significant Issues by Allotments, Within the Westside Allotments Environmental Analysis Project Area, Paulina Ranger District

		Issue #1 Impacts to Riparian and Upland Vegetation	Issue #2 Impacts to Riparian and Upland Soils	Issue #3 Noxious Weeds
Allotment	Deep Creek	All pastures	All pastures	All pastures
	Derr	All pastures	All pastures	Not Present
	Happy	East & West pastures	East & West pastures	All pastures
	Little Summit	All pastures	All pastures	All pastures
	Roba	All pastures	All pastures	All pastures

Other Concerns Identified by the Public and IDT

The Forest Service IDT and individuals responding in the scoping process raised the issues described below. They were evaluated and determined to be issues important to the project but did not contribute to alternative development. They did contribute to mitigation measures that apply to the action alternatives and are tracked through the analysis process.

Heritage Resources

The Forest Service, as a federal agency, is required to comply with regulations 36CFR 800, which implements Section 106 of the National Historic Preservation Act. These regulations require that all federal actions shall not adversely affect historic properties, including Traditional Use Areas by American Indians. All federal actions within the State of Oregon must have clearance with the Oregon State Historic Preservation Officer (OSHPO). Properties that are determined eligible to the National Register of Historic Places, a listing kept by the U.S. Department of the Interior, are to be protected from federal actions.

Implementation of allotment management plan actions would ensure that eligible sites to the National Register of Historic Places would be protected. Site eligibility determinations would be made through the Section 106 compliance process for historic properties within National Forest System lands. These determinations would be made prior to implementation of this project. American Indian tribal members who have off-reservation Treaty rights in the Ochoco Mountains would continue to have access to Traditional Use Areas.

Measures

Percentage of documented disturbance from livestock grazing-related activities to an archaeological site (all archaeological site records include the listing of site disturbance agents and the estimation of that disturbance to the whole site).

Proposed, Endangered, Threatened, Sensitive (PETS) Plant, Animal, and Fish Species

The Forest Service must ensure that proposed management actions do not adversely affect threatened or endangered species and their habitats such that continued existence of a species is in jeopardy. The Forest Service must also insure that sensitive species identified by the Regional Forester are not affected such that the species or populations are moved towards listing under the Endangered Species Act. The grazing of livestock has the potential to affect sensitive species including the greater sage-grouse, gray flycatcher, and the Columbia spotted frog. This issue is addressed through the consultation process with the appropriate regulatory agencies for Threatened and Endangered species, including development of Biological Evaluations or Assessments as appropriate. For sensitive species, this issue will be addressed in the Biological Evaluation.

Measures

Greater Sage-grouse – Acres of suitable sagebrush shrub-steppe and riparian/meadow habitat.

Gray Flycatcher – Acres of suitable upland shrub habitat.

Columbia Spotted Frog – Acres of suitable riparian wetland habitat.

Sensitive Plants – Long-term species viability.

Steelhead, Redband trout, and Chinook Salmon EFH – Stream channel habitat features (width-to depth ratios, streambank stability).

Management Indicator Species (MIS)

Management Indicator Species that historically occupied, are currently known to occupy, or that could be present in the planning area include the pileated woodpecker, primary cavity excavators, northern flicker, redband trout, brook trout, and steelhead. Applicable standards and guidelines for managing these species are described in the LRMP and an effects analysis will be conducted in this document.

Measures

Riparian Dependent Cavity Excavator Species – Acres of suitable riparian hardwood habitat.

Land Birds including Migratory Species

Documented declines in land birds nation-wide, including migratory species, has raised issues and concerns over the affects of land management activities, including the grazing of livestock. An Executive Order, signed January 10, 2001 directs federal agencies, including the US Forest Service, to address the declines of migratory birds through several avenues and actions. This includes the consideration in the environmental analysis of federal actions and the effects upon migratory species of concern from those actions, as directed by NEPA. In December of 2002, the US Fish and Wildlife Service issued a report titled *Birds of Conservation Concern 2002* (USFWS(a) 2002), that identifies migratory bird species of concern in each Bird Conservation Region (BCR). Partnerships with national and international organizations, including Partners In Flight, have developed conservation plans and strategies that form a basis for land bird and migratory bird management and assessment of effects of federal activities on these species.

Measures

Riparian, Grassland, Sagebrush Shrub-steppe, Woodland and Forest Dependent Species – Acres of suitable habitat, per habitat type and focal species.

Other Wildlife Species

Other wildlife species with standards and guidelines established in the LRMP include deer and elk, old growth-associated wildlife species, and raptors with specific guidelines to provide security for nesting and around nest and roost sites. Measures for these species are very specific and include road density and cover for deer and elk, establishment and management of structural conditions in old growth reserves for old growth-associated wildlife species, and seasonal restrictions against human activity for raptors. Since the proposed action of continued grazing will not affect any of the specific LRMP compliance measures, none are proposed for further analysis. LRMP standards and guidelines for snag habitat will be covered under the measures established for MIS.

Social and Economic Values

Livestock grazing within the Westside Allotments Environmental Analysis project area contributes to the social and economic stability of the surrounding community. Agriculture, including ranching, has been a part of the community social fabric since the establishment of Crook and Wheeler Counties. The ranching industry contributes to the economy of the local area. Changes in use on the allotments in the project area can affect the viability of ranching operations, which could impact the local community.

Measures

Permitted Animal Unit Months (AUM's) gain or loss, currently valued (2004) at $7.86 per AUM for Region 6.

303 (d) Listed Streams

Currently Dipping Vat Creek, Roba Creek, Dry Paulina Creek, North Fork Crooked River, Crazy Creek, Deep Creek, Happy Camp Creek, Jackson Creek, Double Corral Creek, and Little Summit Creek are on the Oregon Department of Environmental Quality 303 (d) list of impaired waterbodies for exceeding temperature standards. Livestock grazing has the potential to indirectly affect water temperature and other water quality parameters. Streams without riparian vegetation may become overly wide, thus allowing for greater solar infiltration, and warm in the absence of hardwood shrubs that provide near-surface shade. Eroding streambanks may also be causal in excessive fine sediment production. Livestock defecate in streams which can cause an increase in fecal coliform and nutrient levels, as well as change other water chemistry variables such as lowering dissolved oxygen levels.

Measures

Stream Temperature/Shade

North Fork Crooked Wild and Scenic River

Segment three of the North Fork Crooked Wild and Scenic River lies partially within the project area. Scenery and botanical values are designated as outstandingly remarkable values within this segment. Livestock grazing may affect the outstandingly remarkable scenic values by altering native plant communities, trampling vegetation, exposing mineral soils, and depositing fecal material. These changes will be used to determine the progress in meeting the desired conditions as outlined in the North Fork Crooked River Management Plan (April 1993).

Measures

Changes in herbaceous and woody plant species composition and soil disturbance (percent).

CHAPTER TWO: ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Westside Allotments project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the physical, biological, social and economic effects of implementing each alternative.

Alternatives

Alternative 1 - No Action/No Grazing

Under the No Action alternative, all Term Grazing Permits would be cancelled within two years of implementation of the decision. The requirement to implement this decision no sooner than two years following the project decision is pursuant to Forest Service Handbook (FSH) 2209.13 part 16.24, and the Code of Federal Regulations (36CFR 222.4 (4) (1)). It is in effect an economic mitigation measure directed by policy and regulation. No permits would be issued for any of the five affected allotments unless a subsequent NEPA decision to re-stock any or all of the allotments was made. Since there would be no livestock grazing under this alternative, no mitigation measures would be implemented related to the effects of livestock on physical and biological resources.

Maintenance of range developments on the allotments would no longer be the responsibility of the permittees. Subsequent decisions would need to be made regarding retention and maintenance of any improvements (such as water developments and fences). All developments not needed for resource management would be removed. Permittees who participated in the development of range improvements would be reimbursed for their amortized share, consistent with direction in FSH 2209.13, Chapter 70.

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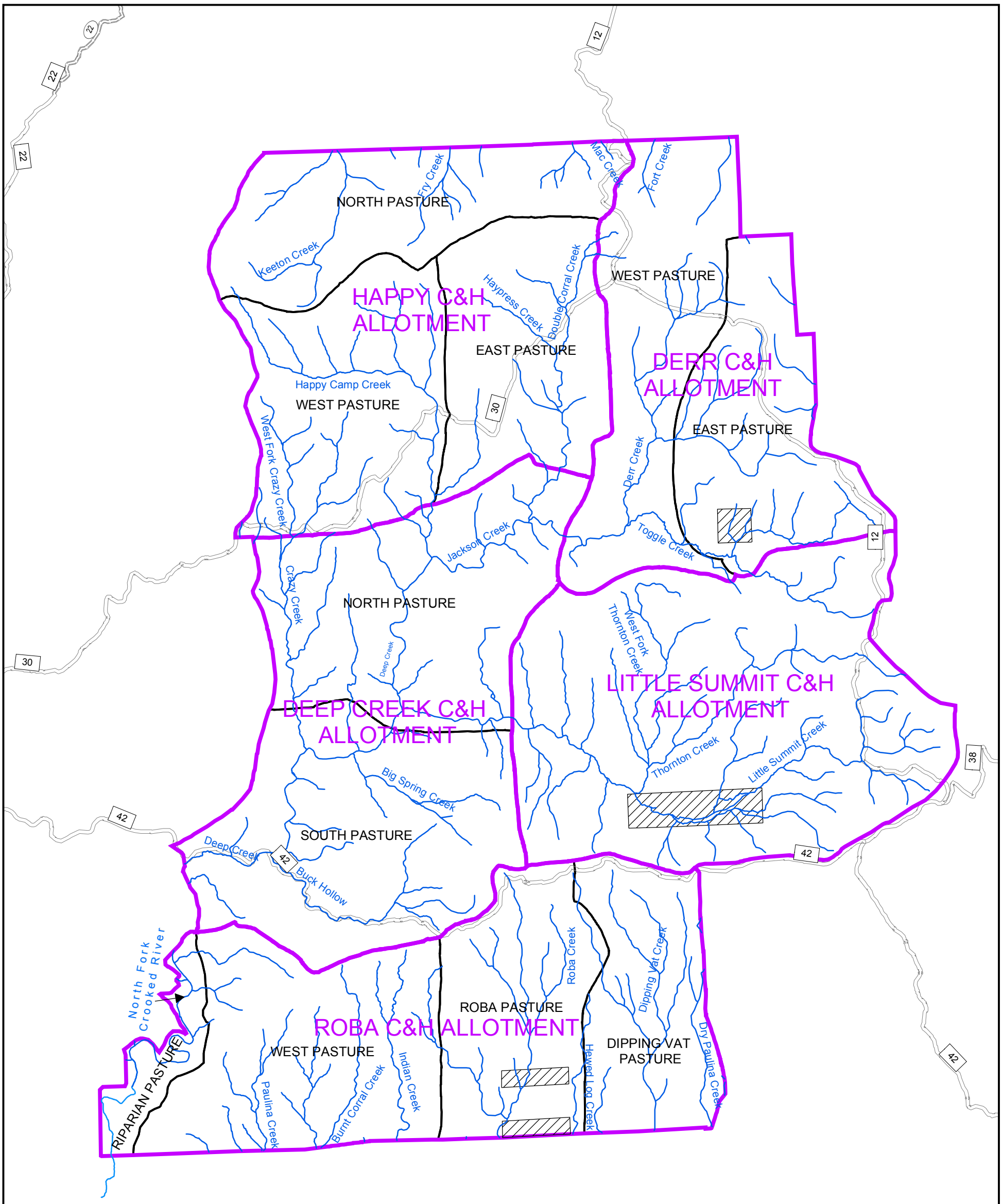

Figure 3 - Select Features of the Westside Allotment Analysis Project, Paulina Ranger District, Crook and Wheeler Counties, Oregon

Legend

- Streams
- Private Land
- Allotments
- Roads
- State
- County
- Pastures

0 0.375 0.75 1.5 Miles

N W E S

Amanda McKinnis
September 15, 2005

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Alternative 2 - The Proposed Action

The Proposed Action was developed to meet the purpose and need for action described in Chapter One and to address the issues identified through the scoping process. The Proposed Action would authorize livestock grazing in all five allotments under new grazing management standards using an adaptive approach. Grazing management standards would be implemented based on an assessment of the level at which resources within pastures or allotments are functioning. A system is functioning when the soil of the area and the vegetation that it supports are in satisfactory condition; water from precipitation and runoff is effectively absorbed, routed, and retained longer within the watershed; erosion occurs slowly, is limited in scope, and is filtered by landform and vegetation; and systems can withstand and recover quickly from disturbance events. Based on existing data, only resources in the North Pasture of the Happy Allotment are functioning properly. Resources throughout the Derr, Little Summit, and Deep Allotments and the East and West pastures of the Happy Allotment are functioning at risk, while resources on the Roba Allotment are currently non-functioning. Under the Proposed Action, the Roba Allotment would be rested for three years following the decision to allow for improvement of resource conditions and aggressive treatment of noxious weeds.

This alternative prescribes management standards to maintain or improve resources that would be impacted by livestock grazing. These standards would not be used as resource objectives, but rather, they would be used as triggers to guide livestock management to achieve the overall objectives of acceptable resource conditions as required by the LRMP and subsequent amendments. Individual standards or practices would be more restrictive in an area that is functioning-at-risk or non-functioning than an area that is functioning properly. Mitigation measures listed for this alternative also serve to ensure that resources would be maintained or improved.

In the Proposed Action, management standards include utilization levels for riparian and upland herbaceous and woody vegetation, stubble height along the greenline, stream bank alteration, and soil disturbance (Table 5). Permittees would use the standards as triggers for determining when and how to manage livestock use. Some strategies that would be used by a permittee when standards are met include moving livestock to another pasture or off the allotment after the last pasture is used, sending riders to herd livestock away from areas where standards have been met, or using temporary fences to exclude livestock from an area. Individual management standards are further described below.

Utilization

Herbaceous species: Utilization standards would be applied to both riparian and upland herbaceous species. Allowable use in riparian and upland areas would be from 0-40% for herbaceous species depending on functional class. For pastures that are properly functioning, utilization standards would be up to but not exceeding 40% of the current year's annual growth. Utilization standards for functioning-at-risk sites would be from 20-39%. Non-functioning sites would have 0-19% utilization standards. Utilization would be estimated using accepted agency protocols such as the landscape appearance method, height – weight curves, and clipping and weighing vegetation.

Woody species: Permittees would use strategies to manage livestock when it becomes evident that livestock preferences are switching from grass and grass-like species to shrubs. These strategies include moving livestock to the next pasture, out of the area being used, or temporary fencing. These strategies apply to all riparian sites regardless of functional class. On upland sites, allowable use by livestock on woody species would be from 0-20%, depending on functional class. Properly functioning sites would have utilization standards up to but not exceeding 20%. Utilization standards for sites that are functioning at risk would be 10-19%; standards for nonfunctioning sites would be 0-19%. Standard protocols

accepted for use in the Forest Service would be used to estimate utilization levels on woody species, such Photo Point Monitoring (Hall, 2002).

Streambank Alteration

Streambank alteration would be allowed up to but not exceeding 10% for properly functioning and functioning-at-risk sites. Alteration thresholds for non-functioning sites would be set at 0-9%, since these sites need additional protection to enable them to recover. Streambank alteration monitoring would be conduced using Agency-accepted protocols such as the "BLM method" (Cowley and Burton, 2005). Observer variability would be quantified and considered in determining whether the standard has been met at a particular site.

Soil Disturbance

Soil Disturbance standards in riparian sites would be up to but not exceeding 10% for proper functioning and functioning-at-risk sites and 0-9% for non-functioning sites. Soil Disturbance standards for properly functioning upland sites would be allowed up to but not exceeding 20%, functioning at risk sites 10-19%, and nonfunctioning sites 0-9%.

Timing

Timing restrictions set forth in PACFISH/INFISH and the Joint 2004 Biological and Terrestrial Programmatic Biological Assessment (here after "Programmatic Biological Assessment") limit the season of use on category one designated pastures (anadromous fish bearing). Restrictions for North Pasture of the Happy Allotment and West Pasture of Derr Allotment are that no livestock grazing would occur between February 15 and July 15. In order to meet the intent of the North Fork Crooked River Management Plan, which seeks to protect and enhance the unique values of the area, timing restrictions for the riparian pasture of the Roba Allotment would be instituted. The following practices would apply: early season, short duration grazing between May 15 and June 21. This pasture would be rested every other year.

Numbers and Season-Of-Use

Management standards would be applied at the pasture level and based on results of monitoring and resource condition assessments. Permitted livestock numbers and grazing seasons would initially be the same as described under Alternative 3. All decisions regarding livestock numbers and season-of-use would be made during the Annual Operating Instructions (AOI) meeting. Annual changes to numbers and season of use would be made based on the previous years monitoring and climatic conditions, (i.e. drought).

Adaptive Management

An adaptive management strategy is proposed for Alternative 2, the Proposed Action. This strategy integrates flexibility in the development of the Annual Operating Instructions (AOI) and the management standards set for each allotment, based upon active feedback through implementation and effectiveness monitoring and annual review of the allotment. The purpose is to move various resources and the allotments themselves to a desirable functional class and condition in a more active and responsive way.

The flow chart in Diagram 1 gives a visual representation of the following description:

With the selection of the Proposed Action, management standards, along with the AOI to achieve those standards, would be set for each allotment based upon the functional class (Properly Functioning/Functioning-at-Risk/Non-functioning). Grazing (or rest) would be implemented the next

season, with the required implementation and effectiveness monitoring occurring as prescribed. At the end of the season, two essential questions would be asked, for each allotment, and answered based upon monitoring data: First – were the management standards met? Second – did the management standards move the allotment towards or help maintain the desirable functional class condition?

- If the answer to the first question is "no", then the implementation monitoring would be reviewed to determine whether it was a failure of the AOI or a failure of the permittee to implement the AOI. If the AOI is at fault, the instructions would be reviewed and modified for the following grazing season such that the allotment meets those standards. If implementation of the AOI by the permittee is at fault, appropriate administrative action would be taken for the following grazing season and performance would again be monitored. Unless other information indicated a need to change the management standards, they would remain unchanged. Modifications to those standards, however, could occur if data and analysis indicates a need.
- If the answer to the first question is "yes", then the second question is reviewed based upon scheduled effectiveness monitoring:
    - If the answer to the second question is "no", then the management standards would be reviewed and modified in order to maintain or move the allotment in(to) the desired functional class condition. This may result in a change in functional class designation to a lower class if resource conditions have further deteriorated due to grazing or other factors. This would influence management standards as well. The AOI would be modified to insure grazing meets the new standards set for the allotment.
    - If the answer to the second question is "yes", then the existing management standards and AOI would be affirmed and would continue in the subsequent grazing season. A change in functional class may occur, providing additional flexibility in the management standards, if the allotment resources have improved to justify the new classification. Minor adjustments to the management standards and AOI may also occur if opportunities are identified to increase the rate of allotment improvement.

This strategy relies upon the feedback provided by annual implementation and scheduled effectiveness monitoring to modify or maintain each allotment's AOI, management standards, and grazing strategy. This feedback would influence administrative decisions (including the rest of allotments and/or pastures), as well as other future management decisions (water developments, fence construction, exclosures, etc.) to move allotment resources to a desired functioning classification. Because effectiveness monitoring for the different resources identified in Table 5 are scheduled to occur at different intervals, the review of individual management standards may not occur on an annual basis, nor be reviewed during the same time frame as other management standards. Management standards may still, however, be modified if other data (noxious weed establishment, T&E species occurrence, etc.), information or recommendations merit changes outside those scheduled intervals.

Diagram 1 - Adaptive Management Flowchart

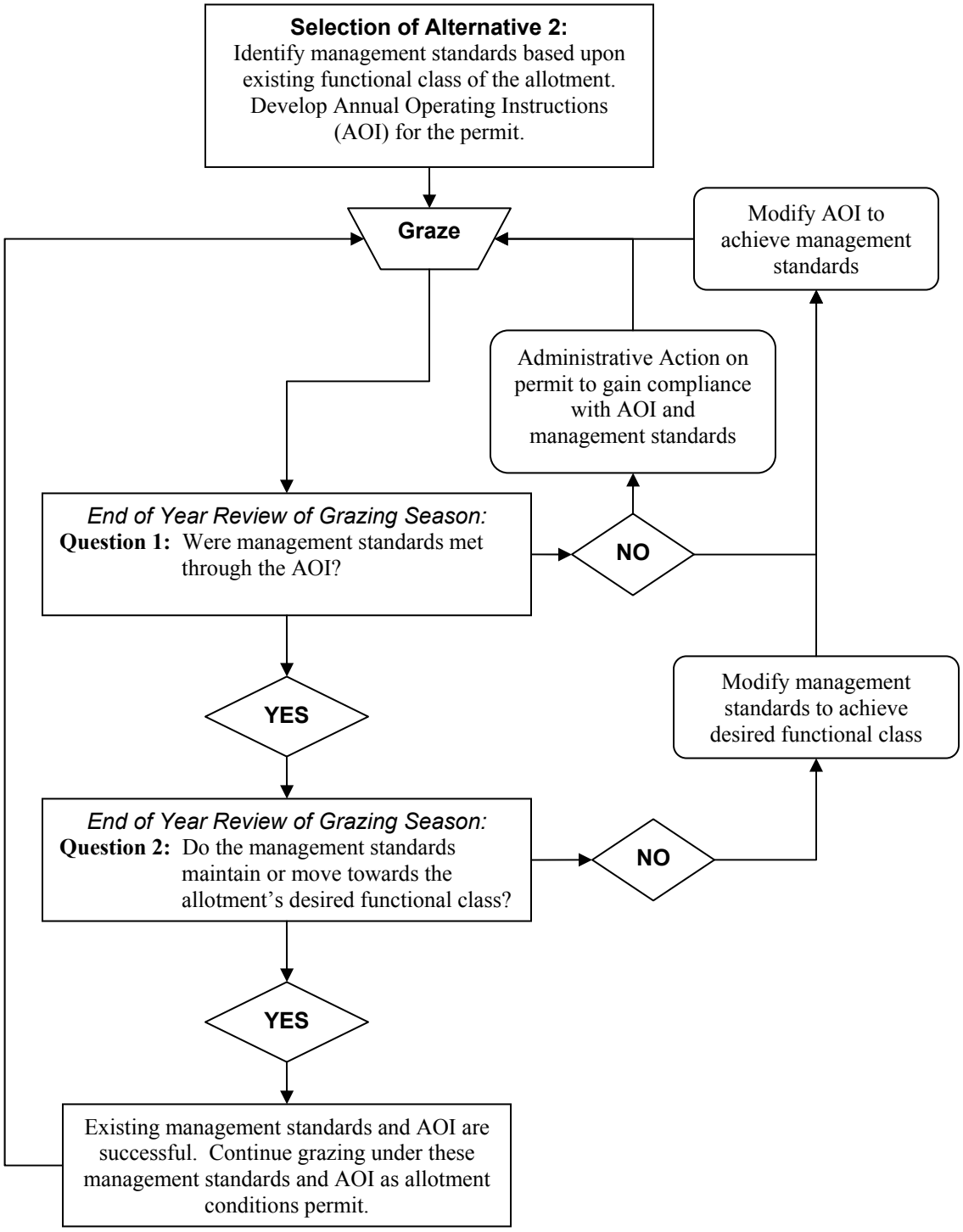

Table 5: Management Standards Under the Proposed Action Alternative Within the Westside Allotments Environmental Analysis Project Area, Paulina Ranger District.

MANAGEMENT STANDARDS				
		Properly Functioning (Satisfactory)	Functioning-at-Risk	*Non-functioning (Unsatisfactory)
UTILIZATION	Riparian and Upland Herbaceous Species Utilization (%)	≤ 40%	20-39%	0-19%
	Riparian Woody Species Utilization	Livestock are moved when there is a change from herbaceous vegetation to woody vegetation consumption		
	Upland Woody Species Utilization (% of annual growth)	≤ 20%	10-19%	0-9%
STREAMBANK ALTERATION	Stream Bank Alteration (%)	≤ 10%	≤ 10%	0-9%
STUBBLE HEIGHT	Stubble Height (inches): Grasses End of grazing use	4”	5”	6”
	Stubble Height (inches):Grass-like End of growing season	6”	6”	6”
SOIL DISTURBANCE	Soil Disturbance by Livestock (%) – Riparian & Forested Communities	≤ 10%	≤ 10%	0-9%
	Soil Disturbance by Livestock – Shrub and Grassland Communities	≤ 20%	10-19%	0-9%
TIMING	Restrictions for North Pasture of the Happy Allotment and West Pasture of Derr Allotment	No livestock grazing would occur between February 15th and July 15th.		
	Restrictions for the Riparian Pasture of the Roba Allotment (N Fork Crooked River), will take effect after the initial 3 year rest period for the Roba Allotment	Early season, short duration (≤ 20 days) grazing between May15th and June 21st. Pasture would be rested every other year.		

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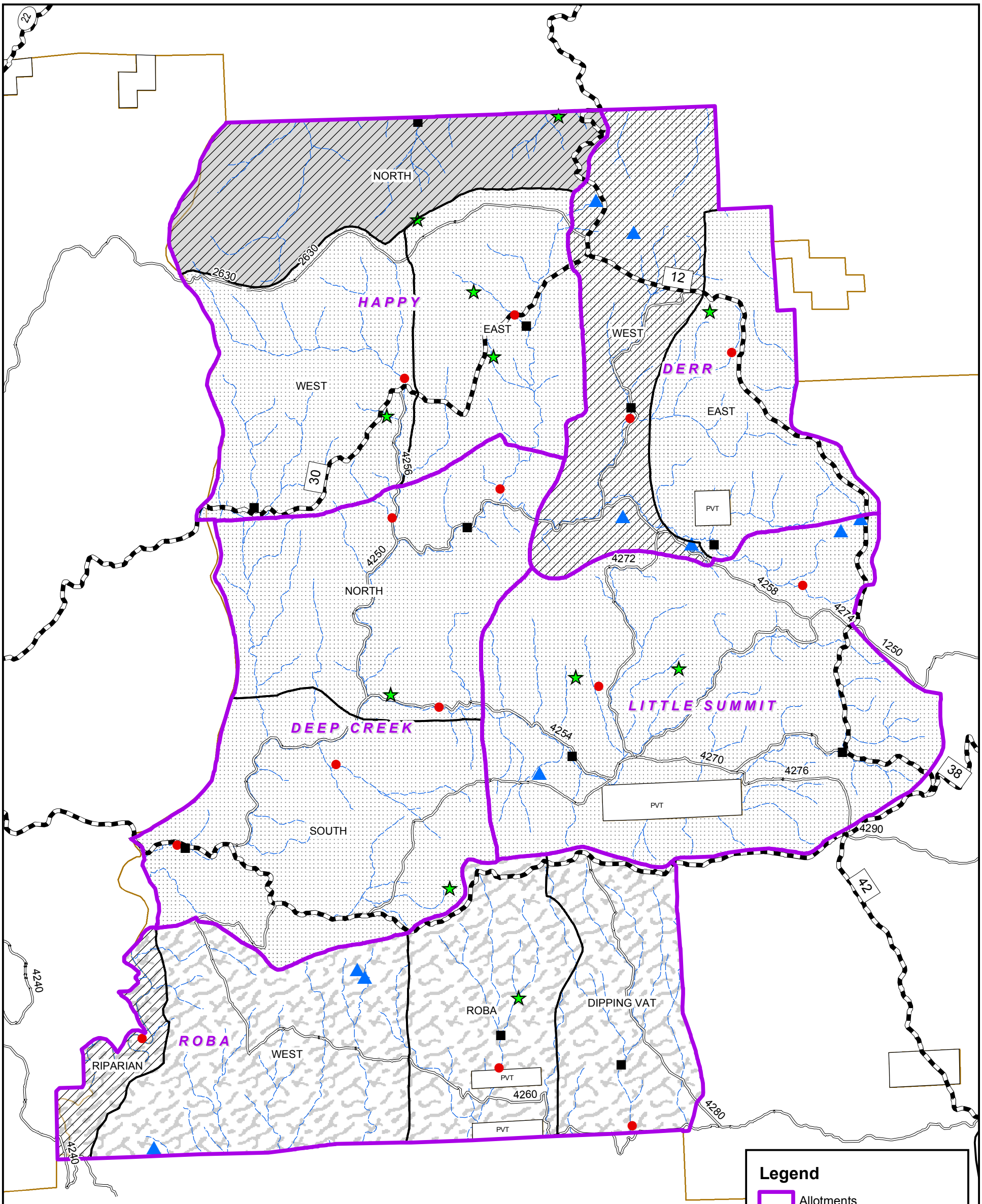

Figure 4 - Select Features of Alternative 2 Under the Westside Allotment Analysis Project

Amanda McKinnis
March 18, 2005

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Mitigation Measures Specific to Alternative 2

The following mitigation measures were developed to reduce negative impacts from the proposed action and respond to public comments:

Noxious Weeds

1. All agency and permittee owned off-road equipment, including all terrain vehicles (ATV's), would be cleaned prior to coming onto National Forest lands as to be free of soil, seeds, vegetative matter, or other debris that could contain or hold noxious weed seeds (Executive Order 13112, February 3, 1999).
2. The Forest Service would inspect equipment prior to its off-loading from the transportation vehicle. Vehicles requiring cleaning would be moved to a site designated by the Forest Service if cleaning is needed prior to start of operations.
3. Livestock entering the Forest from a known pasture infested with noxious weeds may require holding and feeding for a period of several days in a small holding area in order to allow any seed to pass through the digestive tract. The District Ranger would designate an appropriate holding area in consultation with the affected permittee.
4. Any seeding completed as part of grazing management would use seed in accordance with the LRMP, certified as weed free. The Forest Service would designate the appropriate seed mix.
5. The Forest Service would provide grazing permittees a map showing noxious weed infestations within each allotment during Annual Operating Instruction meetings.
6. The Forest Service would provide permittees with weed identification material and training each year or as requested to help them recognize noxious weed species.
7. Permittees would not use weed-infested areas for camps, holding areas, salting areas, or parking areas.
8. All materials used in grazing management activities by the Forest Service and permittees, including logs, rock, boulders, fill-dirt, and gravel, would come from noxious weed-free sources.

Sensitive Plant Populations and Habitat

1. Permittees would not place salt or feed blocks within ¼ mile of known Sensitive plant species populations or suitable habitat. The Forest Service would provide guidance to permittees in the placement of salt.
2. Ground disturbing equipment would not operate within a 50 foot buffer of sensitive plant populations and habitat without the approval of the District Ranger. The Forest Service would specify exceptions, which may include the re-use of existing roads and areas reviewed and approved by the District Ranger.
3. Permittees would avoid ground disturbing activities on scablands to protect sensitive plant habitat. The Forest Service would provide for on-site review of unanticipated disturbances, which would be approved by the District Ranger.

Wildlife

1. Project design criteria for sage-grouse, listed in the current edition of the Programmatic Biological Assessment, would be applied immediately if monitoring discovers the nesting or brooding of this species within the project area.
2. Project design criteria specific to threatened or endangered species, listed in the current version of the Programmatic Biological Assessment, would be applied immediately if monitoring discovers new species populations within the project area.

Hydrology and Fisheries

1. Project design criteria for the essential fish habitat of bull trout, steelhead trout, and Chinook salmon (EFH), as listed in the current version of the Programmatic Biological Assessment, would continue to apply. Criteria for livestock grazing activities in riparian areas would adhere to standards in the Programmatic or the Proposed Action, whichever is more protective.

Range

1. Permittees would use riders to control livestock movement and meet management standards.
2. Permittees would move livestock as needed to obtain even utilization across the entire pasture/allotment.
3. Permittees would place salt and feed blocks at least ¼ mile from riparian areas, water, or trails used by the public.
4. The Forest Service would implement pasture use and rotation according to allotment specific management plans or Annual Operating Instructions.

Soils

1. Permittees would not place livestock on the Forest when soil moisture levels would result in damage to soils.
2. Permittees would use appropriate management practices such as temporary fences, where practical, to protect soils sensitive to impacts from livestock grazing.
3. Permittees would provide riders to control livestock movement and limit use of sensitive riparian and upland areas to protect and reduce impacts to soil and vegetation resources.

Heritage Resources

1. Permittees would not place salt or feed blocks or concentrate livestock within 500 feet of known eligible cultural sites. The Forest Service would provide guidance to permittees in the placement of salt.

Monitoring Requirements Specific to Alternative 2

Monitoring is used to ensure that the management standards are implemented as planned and to evaluate whether the prescribed management is accomplishing the desired objectives. Implementation (short term) monitoring usually occurs on an annual or more frequent basis. Effectiveness (long-term) monitoring is conducted to determine if management is moving resources toward desired conditions. Implementation monitoring can include utilization of herbaceous or woody species, stubble height of residual vegetation

following grazing, soil disturbance, streambank alteration, the presence or absence of noxious weeds, and presence of livestock in pastures and allotments according to planned use. Permittees would have the primary responsibility for implementation monitoring and acting on triggers for moving livestock. The Forest Service would retain final responsibility for ensuring that standards are met in each allotment.

Effectiveness monitoring can include the amount of bare ground in plant communities, stream channel morphology, stream temperature conditions, the presence or absence of weeds, and the composition of plant species within communities. Trends toward objectives in the allotment management plan and PACFISH/INFISH requirements would be assessed in these evaluations. Accepted Forest Service protocols would be used for implementation and effectiveness monitoring activities and reviewed as needed to stay abreast of emerging science. There is considerable scientific support for using long-term monitoring to validate and modify existing standards in this fashion (e.g.,Clary and Leininger 2000, University of Idaho, 2004).

Should effectiveness monitoring indicate that resources at a monitoring site have changed functional class, a commensurate change would then occur in management. The standards of the next higher or lower functional class would be applied as appropriate and monitoring would continue to ensure that the desired results are being achieved. Non-functional pastures or sites may receive rest, changes in the season-of-use, reduction in livestock numbers, and/or temporary fencing of an affected area.

Monitoring protocols not specifically identified below will follow established or accepted Agency protocols, and utilize new methodologies when they become available. Monitoring requirements under the Proposed Action are listed below by resource.

Range

1. The Forest Service would inspect the Riparian Pasture of the Roba Allotment at least twice each month to monitor for unauthorized or excess livestock use between the months of June and the end of October (implementation monitoring).
2. The Forest Service would monitor allotments annually for compliance with all terms and conditions of grazing permits, i.e., salt and feed block placement; spot-checking pasture move dates; evaluating allowable and actual use; verifying permittee maintenance of range improvements; confirming that authorized livestock are present; and timely livestock movements, etc., (implementation monitoring).

Noxious Weeds

1. The Forest Service would monitor existing noxious weed infestations for spread and density trends by established protocols including gross area, net area and population size estimates. Established photo point monitoring of houndstongue would continue in the Roba Allotment. This monitoring strategy would take place annually.
2. The Forest Service, in cooperation with County Weed Control agencies (Crook and Wheeler Counties) would identify new noxious weed infestations through a shared inventory process. Portions of allotments would be inventoried on a rotational basis every one to five years.

Vegetation

1. The Forest Service would establish and conduct studies on permanent riparian monitoring sites used to monitor riparian vegetation seral status and soil stability. These plots would be adapted to

use riparian classification and status monitoring protocols when they become available. These plots would be re-evaluated approximately every three to eight years (effectiveness monitoring).

2. The Forest Service would monitor utilization of riparian, upland, and woody vegetation. Stubble height of residual vegetation along the greenline of designated streams would be monitored in accordance with direction in PACFISH/INFISH and the Programmatic Biological Assessment. Stubble height monitoring would occur at least twice during the grazing season on an annual basis (implementation monitoring).
3. The Forest Service would monitor upland vegetation sites for existing condition and apparent trend of vegetation and soils. Monitoring activities would be modified as new monitoring protocols are developed and approved by Region 6. These plots are reevaluated every five to seven years and would be used to help set future management direction (effectiveness monitoring).

Wildlife

1. The Forest Service, in cooperation with other federal and state agencies, would annually monitor for nesting sage-grouse from April through June (Hanf et al. 1994) over a period of five years following implementation of the decision for this project. Monitoring would determine the distribution of nesting grouse, and if this activity is occurring in the project area. Several techniques are available to monitor nesting activity, including the use of radio collars and trained hunting dogs. Interagency coordination is required to implement this monitoring and may also include cooperation with adjacent private landowners to gain access to sage-grouse hens if radio collaring is used for monitoring.
2. The Forest Service would monitor for brooding sage-grouse during the months of May through September (Connelly et al. 2004) over a period of five years following implementation of this project. Monitoring would determine the distribution of brooding sage-grouse and associated habitat. Several techniques are available to monitor brooding habitat use by sage-grouse, including radio collars, trained hunting dogs, and repeated observations of suspected suitable habitat (ibid.). Interagency coordination is required to implement this monitoring and may also include cooperation with adjacent private landowners to gain access to sage-grouse hens if radio collaring is used for monitoring.

Fisheries/Hydrology

1. The Forest Service would monitor stream temperature conditions within each allotment (6^{th} field HUC/subwatershed), in addition to specific streams currently on the Oregon Department of Environmental Quality 303 (d) list of impaired waterbodies (effectiveness monitoring). Trends attributable to livestock grazing would be expected after a period of 3 – 15 years for properly functioning and functioning-at-risk streams, and >15 years for non-functioning sites to allow for adequate recovery. This period is believed to be sufficient to ascertain the effects of livestock grazing in the face of climatic variability.
2. The Forest Service would establish permanent effectiveness monitoring sites (e.g., channel cross–sections, longitudinal profiles, pebble counts) on selected streams throughout the project area to determine the condition and trend of channel morphology, by channel type, as affected by livestock grazing (effectiveness monitoring).). Trends attributable to livestock grazing would be expected after a period of 3 – 15 years for properly functioning and functioning-at-risk streams,

and >15 years for non-functioning sites to allow for adequate recovery. This period is believed to be sufficient to ascertain the effects of livestock grazing in the face of climatic variability.

3. The Forest Service would conduct monitoring at reference sites, by channel type, to determine the rate at which stream channels are moving toward attainment of Riparian Management Objectives (RMOs).
4. Forest Service Regional stream surveys (Level II, Bottom Line Surveys) would be conducted in selected streams throughout the project area. This information would help to describe the quantity and quality of fisheries habitat.
5. The Forest Service would monitor streambank alteration annually to determine the level of physical alteration along the streambank in the current grazing season using the "BLM method" (implementation monitoring).

Soils

1. The Forest Service would monitor soil disturbance on monitoring sites annually (implementation monitoring).
2. The Forest Service would monitor ground cover on monitoring sites (effectiveness monitoring).

Heritage Resources

1. The Forest Service would monitor ground disturbance, from livestock, in areas of high probability for cultural materials, and in the vicinity of known cultural sites (effectiveness monitoring).

Alternative 3 – Current Allotment Management

Alternative 3 reflects current management of the five allotments. The allotments would be managed according to the standards and criteria established in the LRMP, Allotment Management Plan, Annual Operating Instructions, and the Term Grazing Permit.

The allotments would be monitored throughout the grazing season for stubble height, streambank alteration, and woody species utilization. Annual Operating Instructions (AOI) (numbers and seasons of use) would be adjusted in response to the previous years monitoring results and expected climatic conditions for the upcoming grazing season. Allotments failing to meet standards would have annual adjustments in livestock numbers, season of use, and nonuse on pastures with serious noxious weed concerns

All of these allotments are actively grazed by livestock under current term grazing permits. Deep Creek and Roba Allotments have been administered jointly as one allotment since 1995 in order to improve rider efficiency and livestock distribution. Table 6 displays current management standards.

Table 6: Current Management Standards

CURRENT MANAGEMENT STANDARDS							
					SAT	UNSAT	
INTENSITY: Utilization - Stubble Height (Riparian), % of Annual Growth (Non-riparian)	Riparian Herbaceous Species Stubble Height (Inches) for Kentucky Bluegrass dominated sites: End of grazing use (PACFISH/INFISH)				Before 6/30 – 2” Between 7/1 & 8/15 – 3” After 8/15 – 4”	Before 6/30 – 2” Between 7/1 & 8/15 – 3” After 8/15 – 4”	
	Riparian Herbaceous Species Stubble Height (Inches) for sites other than Kentucky Bluegrass dominated are: End of grazing use (PACFISH/INFISH)				Before 6/30 – 3” After 7/1 – 4”	Before 6/30 – 3” After 7/1 – 4”	
	Riparian Herbaceous Species Stubble Height (Inches): End of growing season (PACFISH/INFISH)				4” Grasses 6” Grass-like	4” Grasses 6” Grass-like	
	Riparian Woody Species Utilization (PACFISH/INFISH)				Livestock are moved when there is a change from herbaceous vegetation to woody vegetation consumption		
	Range Resource Management Level	Forested Communities		Grassland Communities		Shrubland Communities	
		SAT	**UNSAT**	**SAT**	**UNSAT**	**SAT**	**UNSAT**
	B - Livestock use managed within current grazing capacity by riding, herding, salting, and cost-effective improvements used only to maintain stewardship of the range (Little Summit Allotment).	40	0-30	50	0-30	40	0-25
	C - Livestock managed to achieve full utilization of allocated forage. Management systems designed to obtain distribution and maintain plant vigor include fencing and water development (Deep Creek, Derr, Happy, and Roba Allotments).	45	0-35	55	0-35	45	0-30
INTENSITY: Streambank Alteration (PACFISH/INFISH)	Stream Bank Alteration (%)	≤10%					
TIMING (PACFISH/INFISH)	Restrictions for North Pasture of the Happy and West Pasture of the Derr Allotments.	No livestock grazing between February 15th and July 15th.					

Table 7: Current Allotment Information

Allotment	Acres	Permit Type	Permitted Number	Kind/Class	Season of Use	Head Months
Deep Creek	17,581	Term	200	Livestock-cow/calf	6/16 to 9/30	703
Derr	12,638	Term	150	Livestock-cow/calf	7/1 to 9/30	454
Happy	18,630	Term	230	Livestock-cow/calf	6/21 to 9/30	771
Little Summit	16,638	Term	200	Livestock-cow/calf	6/21 to 9/30	670
Roba	17,936	Term	236	Livestock-cow/calf	6/16 to 10/15	947

Three types of monitoring would be required for the purpose of strengthening the implementation of PACFISH (Category I), INFISH (Category II) and the attendant salmon, steelhead and bull trout Biological Opinion. These include implementation, effectiveness, and validation monitoring. In 1999, the Ochoco National Forest first developed a Programmatic Biological Assessment that would meet the monitoring requirements as set forth in the various Biological Opinions. Since 1999, the project design criteria have been adjusted based on monitoring data and end of year reporting. Project design criteria are based on the Forage Utilization/Stubble Height threshold within the greenline and upper terraces at stream channels and other springs (these are identified key areas). Seasonal pasture moves are based on 2, 3, and 4-inch stubble height requirements. All pasture stubble height requirements must be 4 inches at the end of the growing season. Adjustments in grazing would occur if end of growing season stubble height requirements were not met, in accordance with the Programmatic Biological Assessment.

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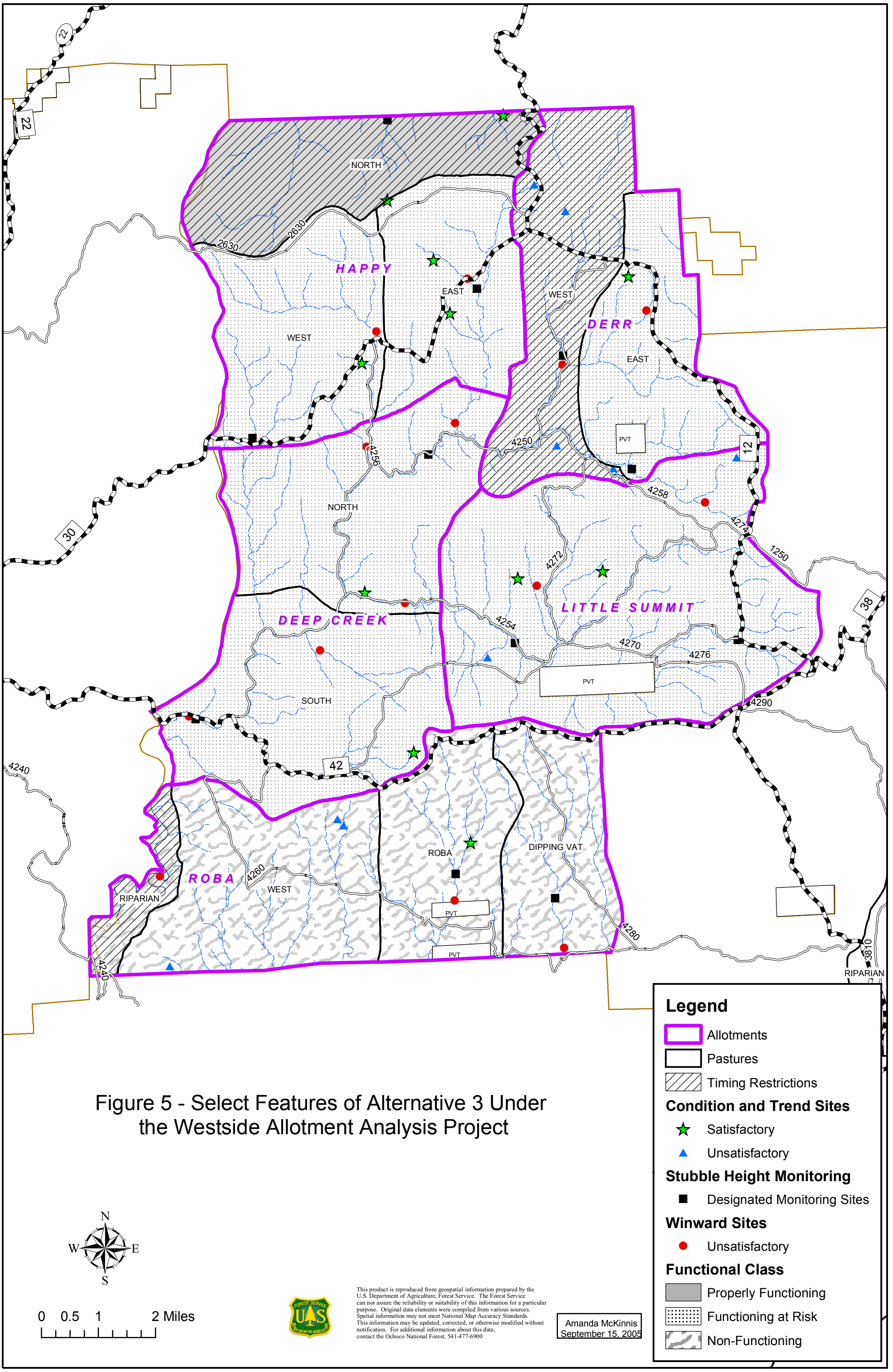

Figure 5 - Select Features of Alternative 3 Under the Westside Allotment Analysis Project

Amanda McKinnis
September 15, 2005

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Mitigation Measures Specific to Alternative 3

The following mitigation measures were developed to reduce the potential for negative impacts and respond to public comments:

Noxious Weeds

1. All agency and permittee owned off-road equipment (including ATV's) would be cleaned prior to coming onto National Forest lands as to be free of soil, seeds, vegetative matter, or other debris that could contain or hold noxious weed seeds (Executive Order 13112, February 3, 1999).
2. The Forest Service would inspect equipment prior to its off-loading from the transportation vehicle. Vehicles requiring cleaning would be moved to a site designated by the Forest Service if cleaning is needed prior to start of operations.
3. Livestock entering the Forest from a known pasture infested with noxious weeds may require holding and feeding for a period of several days in a small holding area in order to allow any seed to pass through the digestive tract. The District Ranger would designate an appropriate holding area in consultation with the affected permittee.
4. Any seeding completed as part of grazing management would use native seed in accordance with Forest Service policy, certified as weed free. The Forest Service would designate the appropriate seed mix.
5. The Forest Service would provide grazing permittees a map showing noxious weed infestations within each allotment during Annual Operating Instruction meetings.
6. The Forest Service would provide permittees with weed identification material and training each year or as requested to help them recognize noxious weed species.
7. Permittees would not use weed-infested areas for camps, holding areas, salting areas or parking areas.
8. All materials used in grazing management activities by the Forest Service and permittees, including logs, rock, boulders, fill-dirt, and gravel, would come from noxious weed-free sources.

Wildlife

1. If monitoring discovers nesting or brooding sage-grouse within the project area project design criteria for sage-grouse (2004 Programmatic Biological Assessment) would be immediately applied and the frequency of monitoring increased.
2. If monitoring discovers new populations of Threatened and Endangered species project design criteria specific to those species (2004 Programmatic Biological Assessment) would be immediately applied.

Hydrology and Fisheries

1. Project design criteria for bull trout, steelhead trout, and chinook salmon EFH, as listed in the current version of the Joint Aquatic and Terrestrial Programmatic Biological Assessment would continue to apply. Criteria for livestock grazing activities in riparian areas will adhere to standards in the Programmatic Biological Assessment.

Range

1. Riparian and upland utilization monitoring would be used as the primary trigger for removal of livestock from pastures/allotments.
2. Riders would be used to control livestock movement and limit use of sensitive riparian and upland areas to protect soil and vegetation resources.
3. Livestock would be moved as needed to obtain even utilization across the entire pasture/allotment.
4. Salt would be placed at least ¼ mile from riparian areas or other sensitive areas.
5. Pasture use and rotation would be changed annually if feasible. The Forest Service and the permittees would agree on pasture rotations during Annual Operating Instruction meetings.

Soils

1. Soil moisture would be inspected prior to livestock turning onto the Forest.
2. Use riders to control livestock movement and limit use of sensitive riparian and upland areas to protect soil and vegetation resources.
3. Place salt at least ¼ mile from riparian areas or other sensitive areas to protect soils.

Heritage Resources

1. Permittees would not place salt blocks or concentrate livestock within 500 feet of known eligible cultural sites. The Forest Service would provide guidance to permittees in the placement of salt.

Monitoring Requirements Specific to Alternative 3

Range

Monitoring is used to evaluate whether the prescribed management is working, and if there is improvement and long-term recovery to the resource. Some indicators that would be used to evaluate this are the presence or absence of noxious weeds or soil disturbance, the seral status of the vegetation and utilization of herbaceous and woody vegetation. Trend towards objectives in the allotment management plan would be assessed in these evaluations.

1. Compliance with Annual Operating Instructions would be monitored including: spot-checking pasture move dates; evaluating allowable and actual use; verifying permittee maintenance of range improvements; and confirming that authorized livestock are present.
2. Riparian and upland utilization monitoring would be used as the primary trigger for removal of livestock from pastures/allotments.
3. Riparian plots are permanent monitoring sites used to monitor riparian vegetation seral status and soil stability. These plots would be updated as new monitoring protocols when they become available. These plots are reevaluated approximately every three to five years.
4. Stubble Height Monitoring is required under PACFISH/INFISH and the 2004 Programmatic Biological Assessment. Streambank alteration, woody vegetation utilization, and residual herbaceous stubble height are measured at designated sites within a pasture. There would be at least 4” of residual herbaceous stubble height at the end of the growing season. Stubble height

monitoring occurs at least twice during the grazing season on an annual basis, per the 2004 Programmatic Biological Assessment.

5. Condition and Trend Plots are permanent monitoring sites used to monitor the existing condition and apparent trend of upland vegetation and soils. These sites would be modified as new monitoring protocols are developed and approved by Region 6. These plots are reevaluated every five to seven years and would be used to help set future management direction.
6. The Riparian Pasture of the Roba Allotment would be inspected at least twice each month to monitor for unauthorized livestock use. Monitoring begins in June and continues through the end of October.

Noxious Weeds

1. Existing noxious weed infestations would be monitored for spread and density trends by established protocols including gross area, net area and population size estimates. Established photo point monitoring of houndstongue would continue in the Roba Allotment. This monitoring strategy would take place annually.
2. New noxious weed infestations would be identified through an inventory process shared by Forest Service personnel and County Weed Control agencies (Crook and Wheeler Counties). Portions of allotments would be inventoried on a rotational basis every one to five years.

Wildlife

1. The Forest Service, in cooperation with other Federal and State agencies, would monitor for nesting sage-grouse annually from April through June (Hanf et al. 1994) over a period of five years following implementation of the decision for this project. Monitoring would determine presence and distribution of nesting grouse, if this activity occurs in the project area. Several techniques are available to monitor nesting activity, including the use of radio collars and trained hunting dogs. Interagency coordination is required to implement this monitoring, and may also include cooperation with adjacent private landowners to gain access to sage-grouse hens if radio collaring is used for monitoring.
2. The Forest Service would monitor for brooding sage-grouse during the months of May through September (Connelly et al. 2004) over a period of five years following implementation of this project. Monitoring would determine presence and distribution of brooding sage-grouse and associated habitat. Several techniques are available to monitor brooding habitat use by sage-grouse, including radio collars, trained hunting dogs, and repeated observations of suspected suitable habitat (Connelly et al. 2004). Interagency coordination is required to implement this monitoring, and may also include cooperation with adjacent private landowners to gain access to sage-grouse hens if radio collaring is used for monitoring.

Fisheries/Hydrology

1. Stream temperature would be monitored, with streams currently on the Oregon DEQ 303(D) list being prioritized.
2. Forest Service Regional Level II and Ochoco National Forest (Bottom Line Surveys) stream surveys would be conducted in selected streams throughout the project area. This information would help to describe the quantity and quality of fisheries habitat.

Table 8: Comparison of Management Standards Under Alternatives 2 and 3

		Alternative 2	Alternative 3
Utilization	Riparian	0-40% (% of annual growth)	Currently Use Stubble Height (End of Growing Season) 4" Grasses 6" Grass-like
	Upland	0-40% (% of annual growth)	0-55% (% of annual growth)
	Woody Species	Livestock are moved when there is a change from herbaceous vegetation to woody vegetation consumption	Livestock are moved when there is a change from herbaceous vegetation to woody vegetation consumption
Streambank Alteration		≤10%	≤10%
Stubble Height		4-6" Grasses (End of Growing Season) 6" Grass-like (End of Growing Season)	4" Grasses (End of Growing Season) 6" Grass-like (End of Growing Season)
Soil Disturbance	Riparian & Forested Communities	0-10%	N/a
	Shrub & Grassland Communities	0-20%	
Timing	North Pasture, Happy & West Pasture, Derr Allotments	No livestock grazing would occur between February 15 and July 15.	No livestock grazing would occur between February 15 and July 15
	Riparian Pasture, Roba Allotment	Early season, short duration (≤ 20 days) grazing between May 15 June 21. Pasture would be rested every other year. Will take effect after the initial 3 year rest period for the Roba Allotment.	Early season, short duration (≤ 20 days)

Table 9: Comparison of the Anticipated Effects Of The Alternatives Considered In The Westside Allotment Analysis Project, Paulina Ranger District

	Alternative 1 **No Action**	**Alternative 2** **Proposed Action**	**Alternative 3** **Current Management**
Condition of Riparian/Upland Plant Communities	Conditions should improve more quickly than other alternatives. Quickest movement towards desired seral vegetation.	Best recovery of all action alternatives, gradually moving towards desired seral vegetation.	Rapid or consistent improvement is not expected. Likely that some areas would continue not to meet desired seral vegetation condition.
Soil Erosion and Compaction	Most rapid recovery of all alternatives. Quickest movement towards LRMP Standards.	Best soil recovery of all action alternatives, gradually moving towards LRMP Standards.	Soil erosion and compaction would continue at its current rate. Likely that some areas would continue not to meet LRMP Standards
Condition of Stream Channels and Aquatic Habitat	Conditions Streams in a degraded state would improve most quickly and may approach "near natural rates of recovery." Quickest movement towards LRMP/PACFISH/INFISH Standards.	Best recovery of the action alternatives, gradually moving towards LRMP Standards. Adaptive management promotes maintenance and slow improvement of conditions.	Delayed recovery and possible degradation. within the foreseeable future. Likely that some streams would not meet LRMP Standards and/or Water State water quality standards without active restoration activities.
Noxious Weeds	Livestock would not cause or spread noxious weed infestations. Bare ground would be reduced and native plant community health would improve, reducing the susceptibility of the area to noxious weed invasion.	Resting the Roba pasture for 3 years would improve the success of on-going noxious weed treatments and allow native vegetation recovery. Adaptive management techniques such as fencing small infestations and pasture rest, would limit spread by livestock.	Current grazing standards would continue, where livestock act as a vector for spreading noxious weeds. Current pasture function would not likely change, therefore native plant communities would remain susceptible to noxious weed invasion.
Heritage Resources	Provides most protection to ground surface archaeological sites, both known and those not yet found and recorded.	Lower risk of possible damage to ground surface archaeological sites not yet found and recorded.	Continued rate of risk of possible damage to ground surface archaeological sites not yet found and recorded.

Threatened, Endangered, and Sensitive Plant Species	Habitat conditions of sensitive plant species would improve under this alternative.	More stringent grazing standards and the use of adaptive management to quickly address pasture function would move habitat conditions of sensitive plants toward desired future conditions.	Current pasture function would not likely change, therefore habitat conditions for sensitive plant species would not more toward desired future condition.
Threatened, Endangered and Wildlife Sensitive Terrestrial Species	Would result in the greatest level and fastest rate of habitat improvement and suitability for those species which use ground level vegetation. This would effect greater sage-grouse and gray flycatcher the most.	Would result in a lower level of habitat improvement for those species which use ground level vegetation, and at a slower rate of improvement, than Alternative 1; would result in a higher level of habitat improvement for greater sage-grouse and gray flycatcher, and at a faster rate of improvement, than Alternative 3.	Would result in the lowest level of habitat improvement for for those species which use ground level vegetation, and at the lowest rate of improvement, of the three alternatives, and may lead to further declines in habitat quality and condition.
Threatened, Endangered, and Sensitive Aquatic Species	Populations would slowly expand as habitat improves. Some streams would likely still need active restoration activities to improve watershed interconnectivity and genetic health.	Populations would be maintained or slowly expand as habitat improves. Some streams would likely still need active restoration activities to improve watershed interconnectivity and genetic health.	Populations would be maintained yet still vulnerable to local extirpations due to changes in climate and flow. Active restoration would still be needed to improve watershed interconnectivity and genetic health.
Management Indicator Species (MIS)	Would result in the greatest level and fastest rate of habitat improvement and suitability for MIS.	Would result in a lower level of habitat improvement for MIS, and at a slower rate of improvement, than Alternative 1; would result in a higher level of habitat improvement for MIS, and at a faster rate of improvement, than Alternative 3.	Would result in the lowest level of habitat improvement for MIS, and at the lowest rate of improvement, of the three alternatives, and may lead to further declines in habitat quality and condition

Land Birds Including Migratory Species	Would result in the greatest level and fastest rate of habitat improvement and suitability for land birds	Would result in a lower level of habitat improvement for land birds, and at a slower rate of improvement, than Alternative 1; would result in a higher level of habitat improvement for land birds, and at a faster rate of improvement, than Alternative 3	Would result in the lowest level of habitat improvement for land birds, and at the lowest rate of improvement, of the three alternatives, and may lead to further declines in habitat quality and condition
Economic Viability/Efficiency for Permittees	Greatest negative impact on all permittees. Loss of 100% of permitted AUM's (4,716) could require permanent herd reductions or purchase or lease of alternate pasture on the part of the permittee.	Possibility of reduction in permitted AUM's after monitoring. Roba Allotment permittee would lose the use of the allotment for a period of at least 3 years resulting in the loss of 1250 AUM's annually. Could require permittee to reduce herd size and/or purchase or lease alternate pasture.	Least impact to permittee, no reduction in permitted AUM's.
Water Quality and 303(d) Listed Streams	Stream temperature conditions would improve most rapidly as shade conditions improve. Some streams would likely still need active riparian planting and restoration activities to move into compliance with State water quality standards.	Stream temperatures conditions would improve slowly as shade conditions improve. Some streams would likely still need active riparian planting and restoration activities to move into compliance with State water quality standards.	Stream temperatures would likely remain in a degraded state and in some reaches may actually worsen. Many streams would likely need active riparian planting and restoration activities to move into compliance with State water quality standards.
North Fork Crooked Wild and Scenic River	Conditions should improve more quickly than other alternatives. Quickest movement towards meeting intent of the North Fork Crooked River Management Plan.	Best recovery of all action alternatives, gradually moving towards meeting the intent of the North Fork Crooked River Management Plan.	Delayed recovery and possible degradation. Likely that some sections would continue not to meet the intent of the North Fork Crooked River Management Plan.

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CHAPTER THREE: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing condition of components of the human environment followed by a disclosure of the environmental effects of implementing the three alternatives described in Chapter Two. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above on pages 45-47.

Mitigation measures are described in Chapter Two. The following assessment of effects assumes the application of these measures. It provides the decision maker with information needed to compare alternatives and select the appropriate course of action.

Three types of effects will be discussed: direct, indirect, and cumulative. A direct effect is an action occurring at the same time and place as that which is acted upon. The retention of a snag has a direct effect on the pileated woodpecker that occupies it. An indirect effect occurs later in time, away from the action. The effect on fish by the removal of shading vegetation is an indirect effect. The effect of past, present, and reasonably foreseeable future actions must also be taken into account. These are cumulative effects. Past and future timber harvest and use must be considered. This analysis follows the guidance provided in the Council of Environmental Quality (CEQ) Memorandum titled Guidance On The Consideration Of Past Actions In Cumulative Effects Analysis (June 24, 2005). This memorandum provides guidance on the extent to which agencies of the Federal Government are required to analyze the cumulative environmental effect of a proposed action in accordance with Section 102 of the National Environmental Policy Act (NEPA) and the CEQ Regulations for Implementing the Procedural Provisions of NEPA.

In general, the time frame of reference for effects are short-term, mid-term, and long-term, and are more specifically defined in individual resource sections. Unless otherwise stated in the following sections, the boundaries of space in which the cumulative effects and the specific actions are considered is the project area described in Chapter One.

Issue # 1: Impacts to Riparian and Upland Vegetation

Introduction

The discussion of range and soil resources and potential effects uses existing information including: the Ochoco National Forest Land and Resource Management Plan (USFS 1989), Deep Restoration EA (USFS 2004), Deep Vegetation Management EIS (USFS 2004), Deep Creek Watershed Analysis (USFS 1999), Deep Water Quality Restoration Plan (USFS 2001), and PACFISH/INFISH (1994/95), project specific resource reports, agency and scientific studies as well as site specific professional experience and judgment.

Range assessments for the Westside Allotments Environmental Analysis Project included Condition and Trend (C&T) transects established in the 1950s and 1960s and reread in 2002/2003. Condition and Trend data was further supported by 21 paced transects. Condition and Trend and paced transects were scored in 2003 using available Region 6 scorecards. Riparian transects and existing stream data were used to determine current conditions on project area streams and riparian areas. The previously mentioned data as well as professional judgment, stream survey information, and ocular field observations were used to determine the existing condition and to rate the current functionality of the

grazing allotments. For a more detailed discussion of existing conditions and environmental consequences associated with implementing the three alternatives, refer to the project specific resource reports (analysis file).

Condition & Trend Transects: Twenty-six Condition and Trend Cluster transects (Parker 1951) were established in the 1950s and 1960s. Of the original 26 transects, four have been destroyed due to logging operations over the years. The remaining 22 were revisited and 21 were analyzed in 2002 and 2003 (these transects were revisited four years into a dry cycle). Condition and Trend transects measure and monitor plant species composition changes over time and provide an indication of ecological trend. Condition and Trend transects also provide information about soil surface conditions, such as the presence or absence of bare soil, litter, rock or plant material.

Riparian Monitoring Plots: In 2003, riparian area information was collected on allotments and current conditions calculated using methods outlined in "Monitoring the Vegetation Resources in Riparian Areas" (Winward 1991). Greenline vegetation composition, streambank stability, woody species composition, and regeneration are analyzed during the monitoring process. These permanently staked monitoring sites provide the basis for current riparian condition and provide a means for long-term monitoring of the riparian resources. These monitoring plots would be updated as new monitoring protocols are developed for the Ochoco National Forest. For the location of these monitoring sites refer to the Range Report in the analysis file.

Stubble Height Monitoring: Stubble height monitoring has occurred annually since 1999 to meet standards found in PACFISH/INFISH (1994/95) and the Joint Aquatic and Terrestrial Programmatic Biological Assessment (2001).

Paced Transects: Twenty-one paced transects described in Forest Service Handbook (FSH) section 532 were used to provide supporting data for current condition and to fill in informational gaps. Paced transects were used to gather forage rating data in areas where benchmarks are absent. Paced transects are not a strictly repeatable measurement - they give only an indication of probable forage rating and an estimated trend.

Affected Environment

Deep Creek Allotment: This allotment is located in the western portion of the project area. It is bounded on the north by the Happy Allotment, on the east by the Derr and Little Summit Allotments, on the south by the Roba Allotment, and to the west by the Lookout Mountain Ranger District, Ochoco National Forest. Since 1995, the Deep Creek and Roba Allotments have been used in conjunction as one allotment in an effort to improve livestock distribution and increase herding effectiveness.

This allotment is comprised of two pastures with the North (8,397 acres) and South (9,184 acres) totaling 17,581 acres. According to the 1961 range analysis for this allotment, approximately 3,258 acres (18.5%) are classified as not suitable for grazing due to steep slopes. Deep Creek is the main drainage for the entire allotment. The allotment is a mix of low/rigid sagebrush scablands and ponderosa pine vegetation types. Elevations range from 4,337 feet in lower Deep Creek to 5,568 feet at the summit of Paulina Butte. The topography is predominately gently rolling hills and flats dissected by steep-sided canyons with some rock outcrops.

Three Condition & Trend clusters were established in 1964 on Ponderosa pine-pinegrass (2) and Stiff sagebrush-Sandberg's bluegrass (1) sites. In 2002, the two remaining permanent range Condition and Trend study plots were re-examined and measured. Current condition and apparent trend were calculated using available Region 6 ecological scorecards. Seven paced transects were used to further support the current conditions calculated for the C&T plots. Data in the form of plant community, effective ground cover, and bare soil was collected and analyzed at two long term transects (C&T) located on two plant association types within the Deep Creek Allotment. These plant association types included Ponderosa pine-pinegrass (CPG2 21) and Stiff sagebrush-Sandberg's bluegrass (SD91 11). Analysis of the C&T plots indicates that the upland vegetation and soils are in fair to good condition with a slight upward to stable trend. The number of plants and the amount of litter, moss, and lichen has shown a slight increased across the Deep Creek Allotment with a corresponding decrease for bare soil. This is further supported by paced transects at seven locations on this allotment.

Riparian monitoring plots, stream surveys, ocular field observations, and professional judgment indicate that portions of Big Springs, Crazy, and Deep Creeks are a mix of Non-functioning and Functioning-at-Risk. This is due to all or a portion of the following indicators: very early seral vegetation, streambank stability, 303d listing for stream temperature, or the width to depth ratio (W:D) exceeds PACFISH/INFISH interim standards.

Based on available data and field observations, the Deep Creek Allotment was designated as Functioning-at-Risk for resource conditions.

Derr Allotment: This allotment is located in the northeastern portion of the project area. It is bounded on the north and east by private lands, on the south by the Little Summit Allotment, and to the west by the Happy and Deep Creek Allotments. This allotment is comprised of two pastures with the East (5,859 acres) and West (6,779 acres) totaling 12, 638 acres. Of the 12,638 acres, 12,478 acres (98.7%) are National Forest land and 160 acres (1.3%) are private lands. According to the 1960 range analysis, approximately 3,052 acres (24.1%) are classified as not suitable for grazing due to steep slopes and dense timbered stands. Jackson Creek is the main drainage for the southern portion of the allotment. The northern portion drains into Fort Creek, a tributary to the John Day River.

This allotment is a mix of dry meadows, low/rigid sagebrush scablands, and dense grand fir/larch stands in the draws with Ponderosa pine on the ridges. Elevations range from 4,500 feet at the northern boundary to approximately 6,050 feet on the northeastern side of the allotment. The topography is predominately gently rolling hills and flats with some steeper slopes to the north.

Historic records indicate that domestic livestock grazing began here in 1882, when the father of George S. Donnelly brought a band of sheep into the forest via Buck Point. It is probable that heavy unrestricted use began during this decade and continued until the Blue Mountain Reserve was established in 1907. The boundaries of the present allotment have changed several times in the past years and District records are not sufficiently complete before 1945 to give an accurate history of permitted numbers or allotment size. Historic records further indicate that, during the 1930s, utilization by sheep caused the removal of livestock earlier every year due to the forage base being completely utilized. Much of this allotment was described by the early Forest Service rangers as looking like a dust bed. In

1951, livestock grazing was changed from sheep to livestock and range recovery was noted as very slow.

Seven Condition & Trend clusters were established from 1961 to 1963 on dry meadow (3), Ponderosa pine-pinegrass (2) and Stiff sagebrush-Sandberg's bluegrass (2) sites. In 2002, the remaining five permanent Condition and Trend study plots were re-examined and measured. Current condition and apparent trend was calculated using available Region 6 ecological scorecards. Four paced transects were used to further support the current conditions calculated for the Condition and Trend plots. Analysis of the Condition and Trend plots for this allotment indicates that the upland vegetation is currently in poor to good condition with a stable to slight upward trend. The Dry Meadows (MD) and Stiff sage/Sandberg's bluegrass (SD91 11) sites stand out for poor vegetation conditions, but most sites are showing an upward trend. It should be noted that these transects were revisited four years into a dry cycle. Soils are in fair to good condition with a slight upward trend reflecting the amount of vegetation and litter on the ground affording soil protection. These findings are further supported by the paced transects that indicate high numbers of plants and amounts of litter with moderate amounts of bare soil.

Riparian monitoring plots, stream surveys and ocular field observations indicate that portions of Derr, Double Corral, Fort, Jackson, and Toggle Creeks are a mix of Non-Functioning and Functioning-at-Risk. This is due to all or a portion of the following indicators; very early seral vegetation, streambank stability, a 303d listing for stream temperature, DEQ list of potential concern for stream temperature, or the width to depth ratio (W:D) exceeds PACFISH/INFISH interim standards.

Based on available data and field observations, the Derr Allotment was designated as Functioning-at-Risk for resource conditions.

Happy Allotment: This allotment is located within the northern portion of the project area. It is bounded to the north by private lands, on the east by the Derr Allotment, on the south by the Deep Creek Allotment, and to the west by the Lookout Mountain Ranger District, Ochoco National Forest. This allotment is comprised of three pastures: the North (6,086 acres), East (5,754 acres), and West (6,790 acres) totaling 18,630 acres. According to a 1958 range analysis, approximately 7,860 acres (42.2%) within this allotment are classified as not suitable for grazing due to steep slopes and dense timbered stands. This number was revised in 1996 to 8,491 acres (45.6%) based on the 1993 Happy Range Allotment Analysis.

This allotment is a mix of dry and wet meadows, dense stands of lodgepole pine and fir, low/rigid scablands, and Ponderosa pine vegetation types. Elevations range from 4,500 feet on the north boundary to 5,850 feet at Buck Point. The topography varies from gently rolling hills and flats dissected by steep-sided canyons with some rock outcrops. Numerous streams flow from this allotment north to the John Day River and south to the North Fork Crooked River.

The Happy Allotment was part of the old Badger Allotment, which was included within the Big Summit District, Ochoco National Forest. Sheep and livestock grazed this area with the Summit Road Stock Driveway being used from 1908 to until 1930. Many years later this driveway still reflected heavy use by livestock, as documented in the allotment records.

Four Condition & Trend clusters were established in 1958 and three established in 1964 on dry meadow (1), moist meadow (3), and Ponderosa pine-pinegrass (2) sites. In 2002, six permanent range Condition and Trend study plots were re-examined and measured. Current condition and apparent trend was calculated using available Region 6 ecological scorecards. Analysis of the Condition and Trend plots indicates that the upland vegetation is currently in fair to good condition with a slight upwards trend. Soils are in fair/good condition with a stable trend reflecting the amount of vegetation and litter on the ground affording soil protection. Desirable species of plants and litter has increased across the Happy Allotment with a corresponding decrease for bare soil.

Riparian monitoring plots, stream surveys, ocular field observations, and professional judgment indicate that portions of Crazy, Happy, and Haypress Creeks are a mix of Non-functioning and Functioning-at-Risk. This is due to all or a portion of the following indicators: very early seral vegetation, streambank stability, a 303d listing for stream temperature, stream survey data, or the width to depth ratio (W:D) exceeds PACFISH/INFISH interim standards.

Based on available data and field observations, the Happy Allotment was designated as Functioning-at-Risk for resource conditions on the East and West pastures. The North Pasture was designated as Properly Functioning for resource conditions.

Little Summit Allotment: This allotment is located within the eastern portion of the project area. It is bounded on the north by the Derr Allotment, on the east by the Rock Creek Allotment, on the south by the Roba Allotment and Wolf Creek Allotments, and to the west by the Deep Creek Allotment. This allotment is comprised of a single pasture totaling 16,368 acre of which 15,728 acres (96%) are National Forest and 640 acres (4%) are private lands. According to the 1961 range analysis, approximately 1860 acres (12%) of Forest Service lands are classified as not suitable for grazing due to steep slopes.

The allotment is a mix of scablands, meadows, and large amounts of heavily timbered areas. Elevations range from 4,920 on Little Summit Creek to 5,800 feet at Round Meadows. The topography is predominately gently rolling hills with a few steep hillsides. Little Summit Creek is the main drainage for the entire allotment.

Domestic livestock grazing began in this area around 1885 when it was used for summering bands of sheep. The Little Summit Sheep Allotment was formed when the Ochoco National Forest was founded in 1911. In 1936, this allotment consisted of 5,140 acres of National Forest land with 480 aces of private land, and remained so until 1944. In 1944, part of the old Toggle Meadow and Jackson Creek allotments were added to the existing Little Summit Allotment. This allotment was fenced in 1962 and grazing use was changed from sheep to livestock the following year.

In 1963, the first of four Condition & Trend clusters were established within this allotment with the remaining three put in place in 1964 on Ponderosa pine-pinegrass (1) and Stiff sagebrush-Sandberg's bluegrass (2), and Low sagebrush-Sandberg's bluegrass (1) sites.

In 2002, four permanent range Condition and Trend study plots were re-examined and measured. Current condition and apparent trend were calculated using available Region 6 ecological scorecards. Five paced transects were used to further support the current conditions calculated for the Condition and Trend plots. Analysis of the Condition and Trend plots indicates that the upland vegetation currently ranges from poor to good with a

generally stable trend. Stiff sage/Sandberg's bluegrass (SD91 11) and Low sage/Sandberg's bluegrass (SD92 21) sites are in poor vegetation conditions. This is largely due to a shift from more desirable forage species to less desirable species and not to a reduction in vegetation. Soils are in fair to good condition with a strong upward trend reflecting the amount of vegetation and litter on the ground affording soil protection. These findings are further supported by the paced transects that indicate high numbers of plants and amounts of litter with small amounts of bare soil.

Riparian monitoring plots, stream surveys and ocular field observations indicate that portions of Little Summit Creek and an unnamed tributary of Jackson Creek are ether Non-functioning or Functioning-at-Risk. This is due to all or a portion of the following indicators: very early to mid seral vegetation, streambank stability, and a 303d listing for stream temperature.

Based on available data and field observations, the Little Summit Allotment was designated as Functioning-at-Risk for resource conditions.

Roba Allotment: This allotment is located within the southern portion of the project area and is bounded on the north by the Deep Creek and Little Summit Allotments, on the east by the Wolf Creek Allotment, on the south by the BLM and private lands, and to the west by the Lookout Mountain Ranger District, Ochoco National Forest. This allotment is comprised of four pastures with Dipping Vat (4,626 acres), Roba (5,286 acres), West (7,024 acres), and Riparian (1,000 acres) totaling 17,936 acres. According to the 1960 range management plan, approximately 2,315 acres (13%) are classified as not suitable for grazing due to steep slopes and rockiness.

This allotment is a mix of low/rigid sagebrush scablands and Ponderosa pine vegetation types. Elevations range from 4,000 feet in the lower draws to 5,500 feet near Paulina Butte. The topography is predominately gently rolling hills and flats dissected by steep-sided canyons with some rock outcrops. The majority of the allotment drains into Beaver Creek, a tributary of the Crooked River.

This allotment was established in 1957, and before that it was a portion of the western section of the old Beaver Creek Allotment. During the early 1900s, before the construction of the boundary fences, this range was freely grazed by livestock from early spring to late fall with virtually no control as to numbers or season of use. As a result, it developed into the poorest condition of any range on the Paulina District.

Three Condition & Trend clusters were established in the 1950s and 1960s on Ponderosa pine-pinegrass (2) and Stiff sagebrush-Sandberg's bluegrass (1) sites.

In 2002, four permanent range Condition and Trend study plots were re-examined and measured. Current condition and apparent trend were calculated using available Region 6 ecological scorecards. Five paced transects were used to further support the current conditions calculated for the Condition and Trend plots. Stream survey information, ocular field observations, and professional judgment were utilized to determine current condition. Analysis of the Condition and Trend plots indicates that the upland vegetation is currently in poor to good condition with generally a static trend. This is largely due to a shift from more desirable forage species to less desirable species and not to a reduction in vegetation. The Low sagebrush/Idaho fescue-bluebunch wheatgrass (SD19 11) sites stand out for poor vegetation conditions with a reduction in the bluebunch wheatgrass component. Noxious

weeds (predominately Houndstongue) are a problem throughout this allotment. Soils are in fair to good condition with a generally static trend reflecting the amount of vegetation and litter on the ground affording soil protection. There has been a slight increase for bare soil. These findings are further supported by the paced transects that indicate static numbers of plants and amounts of litter with increased amounts of bare soil.

Riparian monitoring plots, stream surveys and ocular field observations indicate that portions of the North Fork Crooked River and Roba, Dipping Vat, Indian, and Hewed Log Creeks are a mix of Non-functioning and Functioning-at-Risk. This is due to all or a portion of the following indicators: very early to mid seral vegetation, streambank stability, a 303d listing for stream temperature, DEQ listing of potential concern for stream temperature, or the width to depth ratio (W:D) exceeds PACFISH/INFISH interim standards.

Based on available data, field observations, and the extent of the noxious weed problem, the Roba Allotment was designated as Non-functioning for resource conditions.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: Implementation of this alternative would provide for the greatest improvements to vegetation conditions within the shortest time frame. There would be no direct effects from livestock grazing, trampling, or trailing that is occurring on an annual basis. There would be no direct impact to stream banks in those areas accessible to livestock. There would be no grazing of riparian shrubs (mostly willow) by livestock. Removal of livestock as a direct disturbance to riparian systems would facilitate a more rapid increase than is presently occurring in the amount and diversity of riparian grasses, sedges, and rushes. Removing range developments, such as fences and possibly abandoning or removing water improvements, could directly affect vegetation in the short-term, most notably where heavy equipment is needed to facilitate the removal.

Studies of livestock exclusion from riparian areas have found that recovery of riparian vegetation occurred in four to eight years, depending on site location (Skovlin 1984). Rates of recovery would be expected to vary across this project area. Previously altered sites presently lacking a riparian vegetation component would take longer to fully recover. The return to original conditions (pre-European) on some sites would be very slow or non-existent (Laycock 1989, Winward 1991). In the long-term (15+ years) desirable riparian vegetation, such as riparian grasses, sedges, rushes, and woody species, would out-compete and replace undesirable species, such as shallow rooted annuals.

Discontinuing livestock grazing would allow streams to improve their ecological condition. Stream banks would stabilize as riparian grasses, sedges, rushes, and shrubs reestablish on previously non-vegetated or unstable sites with a corresponding reduction in the percentage of bare ground. This trend would probably continue through the mid to late seral stages, however, this trend would not continue to be stable through time due to the dynamic nature of stream systems. Natural hydrologic processes can produce dramatic changes in short time periods.

Woody species would benefit in both the short (0-15 years) and long-terms (15+ years) from less browsing pressure and would likely expand their canopy cover providing increased amounts of stream shading. In areas capable of supporting woody species, such as willows and alders, increased amounts and age classes of these deeply rooted plants would help stabilize stream banks, catch large woody debris, and filter sediment, all helping to improve water quality. It is expected that increases in the numbers, age classes, and distribution of woody species would only occur in areas with suitable soil conditions. Aspen stands would benefit by increased numbers of young plants resulting from less browsing pressure by livestock and would potentially benefit in the short-term (0-15 years). The continued browsing of aspen by wildlife, conifer encroachment, and the exclusion of fire as a needed disturbance for regeneration would potentially reduce or reverse the short-term gains.

Removing livestock would be expected to have less of an immediate impact to upland vegetation conditions than is expected in riparian areas. The current conditions of some upland communities are the results of past grazing practices and other management activities that occurred before the founding of National Forest management.

Dry meadows, sagebrush, bunchgrass, and shrub-steppe communities would be expected to recover slowly over the long-term (15+ years) following the removal of livestock. Forested communities would be little affected by the removing of livestock because present management practices are leading to densely stocked stands that are not accessible for livestock use. Understory shrubs and grasses are continuing to decline as canopy cover increases. Fuel loading in these areas would continue to increase as would the risk of wildfires in the long-term (15+ years) except in areas where thinning and prescribed fires are used. Belsky and Blumenthal (1997) have stated that livestock grazing is a main contributor to increasingly dense western forests. This statement was discussed by Borman (2003) who acknowledges that past grazing practices, predominately by large sheep herds, did contribute to dense western forests, however, he believes that current grazing management practices do not significantly contribute to increased tree densities and that other management activities, such as fire suppression and logging combined with favorable climatic conditions, especially during the early 20th century, helped promote tree regeneration. No sheep have been grazed within the project area since the early 1960s but logging and fire suppression activities have continued, leading to ever increasing stand densities.

Indirectly, under this alternative, soil conditions would begin to improve in the long-term (15+ years) as increased amounts of vegetation with resulting litter help to protect and stabilize soils while decreasing the percentage of bare ground. Those areas currently in poor to fair condition would experience increases in litter accumulation and decreases in bare ground. This matting and accumulation of dead plant material would insulate the ground, provide some water-holding capacity, and decrease surface soil movement and erosion. Some grasses that evolved with the periodic removal of vegetative material through fire, insects, or ungulates would likely benefit little under this alternative. In the absence of grazing or other disturbances, plants continue to accumulate litter (dead grass blades left at the end of the growing season). After years of litter accumulation, plants go into a "self-imposed stress" whereby the detritus (previous years' growth) chokes out new shoots competing for light (Knapp, et al., 1986). The vigor of the entire plant is compromised and rangelands become less productive and healthy.

The loss of professional rangeland management, permittee awareness of on-the-ground conditions, and decreased emphasis on management within the project area would increase the likelihood of trespass livestock and other unauthorized uses that would go unnoticed and possibly impede vegetation recovery.

Discontinuing livestock grazing could be beneficial to rangeland conditions the first few years and potentially neutral to negative thereafter. In addition to the loss of plant vigor and a decrease in rangeland health, the accumulation of litter allows fine fuels to build, which increases susceptibility to fire.

Cumulative Effects Common to all Alternatives: Past and present management activities such as domestic livestock grazing (sheep and livestock), timber harvest, fire suppression and prescribed burning, road building and maintenance, recreation and special uses have all contributed to degraded riparian and upland vegetation conditions. The Westside Allotments Environmental Analysis Project Area, as well as adjacent Federal and private lands, were considered in the cumulative effect analysis.

Past grazing practices allowed unrestricted grazing, mostly by large numbers of sheep, to occur between 1880 and 1907. This resulted in changes in vegetation communities and soils with a degraded riparian and upland habitat. Changes in livestock grazing practices after the founding of the Ochoco National Forest has allowed some improvement in vegetation condition, but historic impacts can still be seen and continue to contribute to current vegetation conditions. Elimination of livestock grazing permits in this locality could jeopardize the viability of the ranches associated with those permits. Conversion of land use from family based ranching operations to subdivided mini-ranches located adjacent to lands administered by the Forest Service could affect soils and vegetation in watersheds already impacted by other uses leading to decreased soil productivity, increased runoff and sediment loads in streams.

Past timber harvest activities including: the Deep Salvage Sale, 1995 (900 acres); Summit Timber Sale, 1996 (2,040 acres); Fryton/Rainier/Barn Timber Sale, 1992 to present (1,739 acres); and others had the potential to impact vegetation and soils leading to a change in habitat conditions and overall forest productivity. There are both beneficial and detrimental affects associated with these types of activities. Pre-commercial thinning in and around riparian areas reduces the amount of conifer encroachment and opens the forest canopy allowing more sunlight to reach the forest floor. The increased sunlight combined with a reduction in competition for nutrients and moisture enhances understory woody and herbaceous vegetation. Livestock would have a tendency to congregate in the areas that are producing more herbaceous forage that could potentially have negative affects on both plant populations and soil conditions. Detrimental affects to soil conditions include soil compaction and displacement, and creation of bare ground which can lead to increased rates of soil erosion and decreased forest productivity. Future vegetation management activities include: The Deep Vegetation Management Project (includes timber harvest) (6,300 acres); prescribed burning (8,500 acres); and road reconstruction/construction (25 miles). In the long term (15+ years) vegetation and soils would benefit from these types of projects, but short term impacts to vegetation and soils would be expected.

Restoration projects such as those found in the Deep Creek Watershed Restoration Project have the potential to affect vegetation and soils in the short-term (0-15 years) and include:

large wood placement, cutbank revetment, pool habitat restoration, riparian exclosures, spring developments, and stream channel reconstruction. In the long-term (15+ years), these restoration activities would potentially improve both vegetation and soils by repairing headcuts, stabilizing streambanks, and decommissioning roads, ultimately improving overall watershed health.

Past and future road construction and yearly maintenance would continue to alter natural drainage patterns. This has the potential to affect riparian vegetation and its habitat by limiting floodplain interaction and thereby its function. Past and present projects that included road construction are: Summit Timber Sale, 1996 (6.0 miles); Deep Salvage, 1995 (3.0 miles); Dippy Beaver Timber Sale, 1996 (3.7 miles); and Fryton/Rainier/Barn Timber Sale, 1992 to present (15.8 miles). Proposed road decommissioning projects in the Deep Creek Watershed Restoration Project would potentially reduce these impacts and would improve riparian vegetation and its habitat.

Many of the streams in the project area benefited by the presence of beaver, which helped reduce stream velocity, increase sediment deposition, raise water tables, and promote riparian vegetation colonization and habitat expansion. Increased amounts of woody vegetation would likely lead to increased numbers of beaver. Natural hydrologic processes produce changes that are increased by the presence of beaver. As beaver build dams, sediment is deposited in the resulting ponds, which can raise the water table. This expands the riparian zone with more opportunities for riparian grasses, sedges, rushes, and shrubs to colonize and expand.

With grazing eliminated, the project area could become even more appealing, than it is now, for recreation. An increase in recreational use could lead to an increase in all types of human use. Impacts on riparian and upland areas from illegal off-road use may increase impacts to vegetation and soils leading to degraded watershed conditions and reducing forest productivity. Removing livestock from the project area would potentially lead to more increased opportunities for fishing. This would attract larger numbers of anglers, potentially causing a decline in redband trout populations in the North Fork Crooked River, Deep Creek, and associated tributaries.

Increases in the amounts of fine fuels in the form of grasses, forbs, and accumulated litter would likely occur from removing livestock. In the case of prescribed fire found in such projects as: Summit Timber Sale, 1996 (8,000 acres); Dippy Beaver Timber Sale, 1996 (1,200 acres); and Fryton/Rainier/Barn Timber Sale, 1992 to present (2,704 acres), these fuels could be important in carrying a controlled burn. These same fuels, however, may be dangerous in the case of an uncontrolled wildfire. Increased fire intensity and duration can detrimentally affect soils, thereby potentially affecting riparian and upland vegetation.

It is likely that late-season unauthorized livestock use in the Riparian Pasture of the Roba Allotment would occur from neighboring allotments or private lands. This use is expected to be limited, as grazing management strategies have been implemented to detect and remove unauthorized livestock. Unauthorized livestock use has the potential to slow the recovery of vegetation conditions by consuming the vegetation after the growing season and reducing the health and vigor of the plant. This would ultimately have a detrimental affect on the vegetation and soils - the degree would depend on the number of unauthorized livestock (averages approximately 30-40 head) and the duration of use (approximately 1-1.5 weeks).

Summary: Alternative 1 would not expose forage plants, streams, and soils to livestock grazing. Alternative 1 would partially meet the Purpose and Need by leading to vegetation conditions that meet the Desired Conditions outlined in Chapter One, but would not authorize livestock grazing. This would result in more riparian species (both herbaceous and woody) being present with increasing density and vigor, resulting in increased stream bank stabilization, and reduced head cutting and sedimentation. Alternative 1 would improve vegetation conditions in the project area faster than Alternatives 2 and 3.

Alternative 2 – Proposed Action

Direct and Indirect Effects Common to All Allotments: Implementation of the Proposed Action is expected to result in improved riparian and upland vegetation conditions throughout the Westside Allotments Environmental Analysis Project Area. Reductions in the duration of livestock use through implementation of the proposed standards is expected to improve riparian conditions by reducing the amount of time riparian and upland areas are exposed to livestock grazing. The proposed standards allow the flexibility to change as the situation dictates. This is the essence of adaptive management. This alternative addresses the Purpose and Need as outlined in Chapter One by reducing forage utilization to a level that would promote healthy riparian and upland vegetation. Mitigation and monitoring requirements described in Chapter Two would reduce negative impacts to soils and vegetation by outlining management practices such as: controlling livestock movement, salt and feed block placement, limiting ground disturbance, use of temporary fencing, and soil moisture standards to help improve vegetation communities within the project area. There is the possibility that a reduction in the number of livestock or season of use will be necessary in order to meet the proposed management standards. These reductions could possibly run as high as 25% or more.

Direct impacts from livestock grazing, such as riparian and upland forage removal and soil disturbance resulting from hoof action, would occur as a result of implementing Alternative 2. The proposed standards would set forage utilization, browse, and soil disturbance at an appropriate level, thereby allowing riparian and upland vegetation to recover and improve in the short (0-15 years) and long-term (15+ years). Forage removal has the potential to impact individual plants by lowering plant vigor and carbohydrate reserves, thereby affecting overall plant health. Proper utilization levels would allow individual plants and plant communities to maintain health and vigor. Mosley et al. (1997) states that to protect water quality, herbaceous utilization levels of less than 65% are usually appropriate and the utilization of riparian shrubs should not exceed 50 to 60% during the growing season. Popolizio et al. (1994) suggested that studies have found there were no differences in foliar cover of forbs between treatments involving no grazing and 65% utilization. Clary and Webster (1989) suggest that spring utilization levels of 65% and summer utilization levels of 40-50% are sufficient to maintain plant vigor and afford streambank protection. The proposed standards outlined in Chapter Two would not only meet the above recommended utilization levels, but on over 80% of the pastures the utilization levels would be even lower affording the opportunity to improve vegetation conditions.

Studies on stubble height in riparian areas and what the appropriate grazing level should be for maintaining and improving the health of these areas concluded that maintaining a minimum streamside stubble height of 4” may be best in many, but not all, situations

especially when allowing for multiple riparian issues such as maintaining plant vigor, trapping and stabilizing sediment, and stream bank trampling (Clary and Leininger 2000). Clary and Leininger also discussed that stubble height can change depending on stream type and soil classification. Clary and Webster (1989) cited Elmore (1988) in suggesting that 3" to 4" of stubble height would maintain riparian components. Elmore (1988) thought that 3" to 4" stubble height would maintain plant vigor, provide stream bank protection, and aid deposition of sediments needed to rebuild degraded stream banks. The presence of vegetative mats and willows are important for reducing water velocities and trapping sediments that are needed to rebuild stream banks (Clary et al 1996; Platts 1991). Hall and Bryant (1995) maintain that undesirable grazing impacts can occur at any time as stubble height reaches 3" or less. Clary and Webster conclude that grazing strategies in riparian areas must provide for re-growth of riparian plants after use for healthy plant vigor, or should leave sufficient vegetation at the time of grazing for maintenance of plant vigor and stream bank protection. Maintaining a minimum stubble height can help preserve forage plant vigor, reduce browsing on willows, stabilize sediments and indirectly limit stream bank trampling (Clary and Leininger 2000).

Full implementation of utilization, stubble height, and monitoring standards in the Proposed Action, outlined in Chapter Two, would meet or exceed those recommended by a number of grazing studies and would afford for the improvement of riparian vegetation and stream bank stability. Riparian vegetation communities with a very low to mid seral ecological status would improve, although improvement would not occur at a rate as fast as predicted in Alternative 1 (the No Actiion/No Grazing Alternative). Movement to late seral vegetation would likely occur in the long-term (15+ years). Increased amounts of vegetation and litter would provide protection to the soil surface and result in a lower percentage of bare ground.

Utilization on riparian woody species by livestock would be kept to minimum, as livestock would be moved when there is a change from herbaceous vegetation to woody vegetation consumption in accordance with the Proposed Action. This would provide willows and alders with an opportunity to recover from the impacts of annual livestock grazing. Woody species would benefit in both the short (0-15 years) and long-term (15+ years) from less browsing pressure and would likely expand their canopy cover providing increased amounts of stream shading. In areas capable of supporting woody species, such as willows and alders, increased amounts and age classes of these deeply rooted plants would help stabilize stream banks, catch large woody debris, and filter sediment, all helping to improve water quality. It is expected that increases in woody species numbers, age classes, and distribution would only occur in areas with suitable soil conditions. Aspen stands would benefit by increased numbers of young plants resulting from less browsing pressure by livestock and would potentially benefit in the short-term (0-15 years). The continued browsing of aspen by wildlife and the exclusion of fire as a needed disturbance for regeneration would potentially reduce or reverse the short-term gains.

Upland vegetation would benefit from moderate levels of utilization and would begin to show improvement in the short - mid term (5-10 years) as decreased utilization by livestock would help to increase individual plant health and vigor. After reviewing many different research studies, Holechek et al. (1989) found that grazing at moderate levels (40-45%) would maintain healthy rangelands, and that a maximum of 30-35% is needed for rangeland improvement. Utilization levels greater than 45% resulted in declining plant

production. Low sagebrush/Idaho fescue-bluebunch wheatgrass and Stiff sagebrush-Sandberg's bluegrass vegetation types, currently in fair to good condition with a stable trend, would start to improve in the short to mid (5-15 years) to long-term (15+ years). Ponderosa pine-pinegrass vegetation types, currently in fair condition with an upward trend, would continue to improve over the long-term (15+ years). Increased amounts of litter would afford additional protection to soils from erosional forces and direct impacts from livestock. Eventually, the increasing canopy cover in the timbered vegetation communities would cause a decline in the number, health, and vigor of the understory shrubs and grasses.

Utilization levels in the Proposed Action are consistent with both Holechek and Mosley and would be expected to improve vegetation and reduce the percentage of bare ground throughout the project area. Under Alternative 2, as riparian areas improve, the cumulative effects of other activities may have less of an impact on the streams and overall watershed health.

Direct and Indirect Effects Specific to Individual Allotments

Deep Creek Allotment: Early seral vegetation on Big Springs, Deep, Double Corral, and Happy Camp Creeks would move towards mid to late seral vegetation in the long-term (15+ years). Increases in the type and numbers of riparian vegetation would eventually afford better sediment capture, stream bank stability, stream shading, cold-water discharge, and a decrease in the percentage of bare ground. Crazy and Deep Creeks, currently 303d listed for temperature, would benefit from improved cold-water discharge during the warm summer months. Wet meadows, currently in fair to good condition with a stable trend, would begin to show increases in the number and kinds of riparian vegetation in the short-term (5-15 years).

Upland vegetation would benefit from moderate levels of utilization. Ponderosa pine-pinegrass and Stiff sagebrush-Sandberg's bluegrass vegetation types, currently in fair condition with a stable to slight upward trend, would continue to improve in the short to mid (5-15 years) to long-term (15+ years).

Upland woody species would begin to improve in the short-term (0-15 years) as decreased utilization by livestock would help to increase individual plant health and vigor. Aspen stands in both the north and south pastures would benefit by increased numbers of young plants resulting from less browsing pressure by livestock and would potentially benefit in the short-term (0-15 years).

Derr Allotment: Early seral vegetation on the main stem of Jackson Creek and its tributaries would improve towards mid to late seral vegetation in the long-term (15+ years). Increases in the type and numbers of riparian vegetation would eventually afford better sediment capture, stream bank stability, stream shading, cold-water discharge, and a decrease in the percentage of bare ground. Derr, Double Corral, Jackson, and Toggle Creeks, currently 303d listed for temperature, would benefit from improved cold-water discharge during the warm summer months.

Upland vegetation would benefit from moderate levels of utilization. Dry meadows and Stiff sagebrush-Sandberg's bluegrass vegetation types, currently in poor to fair condition

with a stable to slight downward trend, would start to improve in the short to mid (5-15 years) to long-term (15+ years).

Upland woody species would begin to improve in the short-term (0-15 years) as decreased utilization by livestock would help to increase individual plants health and vigor. Aspen stands in both the east and west pastures would benefit from less browsing pressure from livestock and would potentially benefit in the short-term (0-15 years).

Happy Allotment: Full implementation of the grazing and monitoring standards in the Proposed Action would improve both upland and riparian vegetation. Early seral vegetation on Haypress Creek and mid seral vegetation on Happy Creek would improve towards mid to late seral vegetation in the long-term (15+ years). Improvements in the type and numbers of riparian vegetation would eventually afford better sediment capture, stream bank stability, stream shading, cold-water discharge, and a decrease in the percentage of bare ground. Derr, Double Corral, Jackson, and Toggle Creeks, currently 303d listed for temperature, would benefit from improved cold-water discharge during the warm summer months.

Upland vegetation would benefit from moderate levels of utilization. Dry meadow and Ponderosa pine-pinegrass vegetation types, currently in fair to good condition with stable to slight upwards trend, would continue to improve in the short to mid (5-15 years) to long-term (15+ years).

Upland woody species would begin to improve in the short-term (0-15 years) as decreased utilization by livestock would help to increase individual plant health and vigor. Aspen stands, especially in the north and west pastures, would benefit from less browsing pressure from livestock in the short-term (0-15 years).

Little Summit Allotment: Full implementation of the grazing and monitoring standards in the Proposed Action would improve both upland and riparian vegetation. Early to mid seral vegetation on Little Summit Creek and an unnamed tributary of Jackson Creek would improve towards mid to late seral vegetation in the long-term (15+ years). Improvements in the type and numbers of riparian vegetation would eventually afford better sediment capture, stream bank stability, stream shading, cold-water discharge, and a decrease in the percentage of bare ground. Little Summit Creek, currently 303d listed for temperature, would benefit from improved cold-water discharge during the warm summer months.

Upland vegetation would benefit from moderate levels of utilization. Stiff sage/Sandberg's bluegrass and Low sage/Sandberg's bluegrass vegetation types, currently in poor to good condition with a stable to slight downward trend, would start to improve in the short to mid (5-15 years) to long-term (15+ years). Ponderosa pine-pinegrass vegetation types, currently in fair to good condition with stable trend, would continue to improve in the short to mid (5-15 years) to long-term (15+ years).

Upland woody species would begin to improve in the short-term (0-15 years) as decreased utilization by livestock would help to increase individual plant health and vigor. Aspen stands, especially to the south and west of Little Summit Prairie, would benefit from less browsing pressure from livestock and would potentially benefit in the short-term (0-15 years).

Roba Allotment: The proposed three-year rest period would potentially increase the amounts of both upland and riparian vegetation. Very early to early seral vegetation on

Dipping Vat and Roba Creeks would improve towards mid seral vegetation in the long-term (20+ years). Mid seral vegetation (approaching late seral) on the North Fork Crooked River would continue to improve, eventually moving towards late seral vegetation in the long term (15+ years). Improvements in the type and numbers of riparian vegetation would eventually afford better sediment capture, stream bank stability, stream shading, cold-water discharge, and a decrease in the percentage of bare ground. Dipping Vat, Hewed Log, Indian, and Roba Creeks, currently 303d listed for temperature, would benefit from improved cold-water discharge during the warm summer months.

Upland vegetation would benefit from low levels of utilization. Low sagebrush/Idaho fescue-bluebunch wheatgrass and Stiff sagebrush-Sandberg's bluegrass vegetation types, currently in fair to good condition with a stable to downward trend, would start to improve in the short to mid (10-15 years) with these improvements carrying into the long-term (15+ years). The Low sagebrush/Idaho fescue-bluebunch wheatgrass (SD19 11) sites stand out for poor vegetation conditions with a large reduction in the bluebunch wheatgrass component. It is hard to determine if the bluebunch wheatgrass component would increase in the long term (15+ years) because the cause of its decline is unknown. Ponderosa pine-pinegrass vegetation types, currently in fair condition with an upward trend, would continue to improve over the long-term (15+ years). Noxious weeds would continue to be a problem, reducing the amount and quality of available forage until a treatment program utilizing herbicides becomes available. Resting the Roba Allotment, combined with the current treatment program, would slow the rate of spread.

Upland woody species would begin to improve in the short-term (5-15 years) as decreased utilization by livestock would help to increase individual plant health and vigor. Aspen stands on all pastures would benefit from less browsing pressure from livestock and would potentially benefit in the short-term (5-15 years).

Cumulative Effects: Cumulative effects are described under Alternative 1 and apply to this alternative as well. The activities proposed in Alternative 2 would directly affect riparian and upland vegetation. Under the proposed standards outlined in Chapter Two, these affects to riparian and upland vegetation would be positive, increasing the density, health, and vigor of the plant communities. The cumulative effects would be similar to those described in Alternative 1, but likely of a greater extent or magnitude.

Alternative 2 cannot be expected to provide resolution to all of the resource issues because impacts from past, present, and future management activities (refer to the cumulative effects section for Alternative 1) would continue to or have the potential to impact the project area. Rates of recovery for both riparian and upland vegetation would potentially be slowed or reversed by other non-grazing associated activities that would continue to occur.

Summary: Alternative 2 would improve riparian and upland vegetation conditions because the proposed standards, which are consistent with Forest Plan Standards and Guidelines, would limit the exposure of forage plants, streams and soils to livestock grazing. Alternative 2 meets the Purpose and Need and would lead to vegetation conditions that meet the Desired Conditions outlined in Chapter One. This would result in more riparian species (both herbaceous and woody) being present with increasing density and vigor, resulting in increased stream bank stabilization and reduced head cutting and

sedimentation. Alternative 2 would improve vegetation conditions in the project area faster that Alternative 3, yet slower than Alternative 1.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects Common to All Allotments: Current management, as of the year 2005, is inadequate in responding to changes in environmental conditions, on a year-to-year basis. Unlike other actions the Forest Service may undertake, (where it may take years to see the effects of management and respond to them) rangeland managers deal with a different set of forage conditions each year. Vegetation (type, amount, condition, diversity, and density) changes annually depending on environmental factors, management, and human and natural events. Prescriptions that are formulated before the grazing season and applied without regard to a changing environment may fail to achieve desired results. Under Alternative 3, management standards, as currently implemented, would not improve riparian and upland vegetation.

Standards for forage utilization in current term grazing permits range from 0-40% for upland vegetation communities in unsatisfactory condition to as high as 55% for communities in satisfactory condition. Riparian forage utilization standards are currently 0-35% for vegetation communities in unsatisfactory condition to as high as 50% for those in satisfactory condition. Clary and Webster (1989) suggest that spring utilization levels of 65% and summer utilization levels of 40-50% are sufficient to maintain plant vigor and afford streambank protection. Current management in riparian areas has focused on meeting stubble height standards as listed in PACFISH/INFISH (1994/95) and the Joint Biological and Terrestrial Programmatic Biological Assessment within the Deschutes and John Day Basins (2001) requires an end of the growing season stubble height of 4" for grasses and 6" for grass-like species. Current management standards are not adequate for improving riparian and upland vegetation given the current vegetation conditions found across the Westside Allotments Environmental Analysis Project Area. The current vegetation conditions have resulted from past management practices and are such that current management standards allow some areas to remain static or improve at an unacceptable rate.

Vegetation conditions would remain at present condition (refer to the affected environment section) or possibly decline and move away from desired conditions, outlined in Chapter One, in both the short (0-15 years) and long-term (15+ years). The more productive riparian and upland sites may show some recovery, especially those associated with plant communities in mid seral stages dominated by native species. Areas where utilization exceeds forage availability or that currently lack desirable plant species would not see this kind of vegetative response. Current management practices have not reduced undesirable effects on riparian and upland vegetation within the project area; this is partially the result of reduced monitoring efforts by the Forest Service because of dwindling budgets. With properly funded monitoring efforts, current management standards have the potential to improve riparian and upland vegetation conditions, although most recovery would occur in the long-term (15+ years).

Livestock are moved when there is a change from herbaceous vegetation to woody vegetation consumption, however, riparian woody species have not increased and possibly would continue to decline in health, vigor, and in the number of young plants resulting in

less stream shading and decreased stream bank stability. Current grazing management would not improve willow and other riparian woody plants in the project area. Current levels of browsing pressure have not allowed woody species to increase in heath and vigor or to recruit young plants. This has reduced the amount of canopy cover available for stream shading. In areas capable of supporting woody species, such as willows and alders, current or decreased numbers of these deeply rooted plants would not help stabilize stream banks, catch large woody debris, and filter sediment, thereby potentially decreasing water quality. Upland woody species would continue to decline as a result of browsing pressure from livestock. Aspen stands would continue to decline as a result of conifer encroachment and continued browsing pressure from livestock and wildlife. The exclusion of fire as a needed disturbance for regeneration, combined with current grazing management, would result in a decline in stand health, vigor, and the recruitment of young plants. It is expected that current grazing management would only affect woody species numbers and distribution in areas with suitable soil conditions for plant establishment.

Under current levels of utilization, upland vegetation conditions for most communities would likely remain static in the long term (15+ years). Some sites that currently exhibit a downward trend would continue to do so as the heath and diversity of plant species decline and the percentage of bare ground increases. After reviewing many different research studies, Holechek et al. (1989) found that grazing at moderate levels (40-45%) would maintain healthy range lands, and that a maximum of 30-35% is needed for range land improvement. Utilization levels greater than 45% resulted in declining plant production. Current management standards, outlined in Chapter Two, allow up to 55% utilization on upland vegetation communities in satisfactory condition and 35% in those in unsatisfactory condition. Current utilization levels are consistent with both Holechek et al. (1989) and Mosley et al. (1997) and allow the flexibility needed to implement adjustments as the situation dictates. Current grazing management has not taken advantage of this flexibility by adjusting forage utilization to vegetative conditions. Alternative 3, as currently implemented, would not be expected to improve vegetation throughout the project area.

Low sagebrush/Idaho fescue-bluebunch wheatgrass and Stiff sagebrush-Sandberg's bluegrass vegetation types, currently in fair to good condition with a stable trend, would either remain the same or possibly decline in the long-term (15+ years). Ponderosa pine-pinegrass vegetation types, currently in fair condition with an upward trend, would continue to improve over the long-term (15+ years). Increased amounts of litter would afford additional protection to soils from erosional forces and direct impacts from livestock. The increasing canopy cover in the timbered vegetation communities would eventually cause a decline in the number, health, and vigor of the understory shrubs and grasses.

Improvements in resource conditions would only occur after forage utilization is adjusted to current allotment conditions. Movement towards desired conditions would only be expected with full implementation of current management standards and appropriate monitoring efforts. Management standards, as currently implemented, would not meet Forest Plan Standards (USFS 1989) nor would it allow vegetation to move towards Desired Conditions as described in Chapter One. Alternative 3 does not meet the Purpose and Need as outlined in Chapter One because it does not reduce forage utilization and soil disturbance to a level that would promote healthy riparian and upland vegetation.

Direct and Indirect Effects Specific to Individual Allotments

Deep Creek Allotment: Early seral vegetation on Big Springs, Deep, Double Corral, and Happy Camp Creeks would not improve in the short (0-15 years) or long-term (15+ years). Lack of improvements in the type and numbers of riparian vegetation would cause sediment capture, stream bank stability, stream shading, and cold-water discharge to continue to decline. Crazy and Deep Creeks, currently 303d listed for temperature, would not benefit from improved cold-water discharge during the warm summer months. Wet meadows, currently in fair to good condition with a stable trend, would either remain the same or decline in numbers and kinds of riparian vegetation in the mid short-term (5-15 years).

Upland vegetation in general would benefit little from current levels of utilization. Ponderosa pine-pinegrass and Stiff sagebrush-Sandberg's bluegrass vegetation types, currently in fair condition with a slight upward trend, would likely continue to remain the same in the long-term (15+ years).

Derr Allotment: Early seral vegetation on the main stem of Jackson Creek and its tributaries would not improve in the short (0-15 years) or long-term (15+ years). The lack of improvement in the type and numbers of riparian vegetation would cause sediment capture, stream bank stability, stream shading, and cold-water discharge to continue to decline. Derr, Double Corral, Jackson, and Toggle Creeks, currently 303d listed for temperature, would not benefit from improved cold-water discharge during the warm summer months.

Upland vegetation in general would benefit little from current levels of utilization. Dry meadows and Stiff sagebrush-Sandberg's bluegrass vegetation types currently in very poor to fair condition with a slight downward trend, would either remain the same in the short-term (0-15 years) or possibly decline in the long-term (15+ years).

Happy Allotment: Early to mid seral vegetation on the main stem of Haypress and Happy Creeks would not improve in the short (0-15 years) or long-term (15+ years). Lack of improvements in the type and numbers of riparian vegetation would cause sediment capture, stream bank stability, stream shading, and cold-water discharge to continue to decline. Crazy and Happy Creeks, currently 303d listed for temperature, would not benefit from improved cold-water discharge during the warm summer months.

Upland vegetation in general would benefit little from current levels of utilization. Moist meadow and Ponderosa pine-pinegrass vegetation types, currently in fair to good condition with stable trends, would continue to either remain the same in the short-term (0-15 years) or possibly decline in the long-term (15+ years).

Little Summit Allotment: Early to mid seral vegetation on Little Summit Creek and an unnamed tributary of Jackson Creek would not improve in the short (0-15 years) or long-term (15+ years). Lack of improvements in the type and numbers of riparian vegetation would cause sediment capture, stream bank stability, stream shading, and cold-water discharge to continue to decline. Little Summit Creek, currently 303d listed for temperature, would not benefit from improved cold-water discharge during the warm summer months.

Upland vegetation in general would benefit little from current levels of utilization. Stiff sage/Sandberg's bluegrass and Low sage/Sandberg's bluegrass vegetation types, currently

in poor to good condition with a slight downward trend, would remain static or continue to decline in the short-term (0-15 years).

Roba Allotment: Very early to early seral vegetation on Dipping Vat and Roba Creeks would not improve in the short (0-15 years) or long-term (15+ years). Mid seral vegetation (approaching high seral) on the North Fork Crooked River would continue to improve or remain stable. Lack of improvements in the type and numbers of riparian vegetation would cause sediment capture, stream bank stability, stream shading, and cold-water discharge to continue to decline. Dipping Vat, Hewed Log, Indian, and Roba Creeks, currently 303d listed for temperature, would not benefit from improved cold-water discharge during the warm summer months.

Upland vegetation in general would benefit little from current levels of utilization. Low sagebrush/Idaho fescue-bluebunch wheatgrass and Stiff sagebrush-Sandberg's bluegrass vegetation types, currently in fair to good condition with a mostly stable trend, would remain the same in the short-term (0-15 years) and possibly start to decline in the long-term (15+ years). Ponderosa pine-pinegrass vegetation types, currently in fair condition with an upward trend, would likely remain the same or continue to improve over the long-term (15+ years). Noxious weeds would continue to reduce the amount and quality of available forage until a treatment program utilizing herbicides becomes available. Current livestock use and the lack of authorization to use herbicides as a treatment option, would allow for the further spread of noxious weeds (Houndstongue) in the Roba Allotment and adjacent allotments.

Cumulative Effects: The effects of past, present, and reasonably foreseeable future actions are described in detail under Alternative 1 and are applicable to this alternative as well. The rates of recovery or decline for riparian and upland vegetation would be affected by other non-grazing associated activities described under the cumulative effects section of Alternative 1. The activities proposed in Alternative 3 would directly affect riparian and upland vegetation. These affects include a decrease in the number, health, and vigor of the plant communities. The cumulative effects would be similar to those described in Alternatives 1 and 2, but to a greater extent or magnitude. The rates of recovery or decline for both riparian and upland vegetation would potentially be affected by other non-grazing associated activities that would continue to occur.

Summary: Alternative 3, as currently implemented, is the least likely to improve riparian and upland vegetation conditions. Current management standards, which are in line with Forest Plan Standards and Guidelines, have the potential to limit the exposure of forage plants, streams, and soils to livestock grazing. Alternative 3 would lead to a decline in vegetative conditions and would not address the Purpose and Need nor meet the Desired Conditions outlined in Chapter One. This would result in a decline of riparian species (both herbaceous and woody) being present with less density and vigor, resulting in decreased stream bank stabilization, and sedimentation with increases in head cutting. Environmental impacts of this alternative in view of other actions are similar to those described in Alternative 2, but under this alternative recovery would occur at a slower pace or be setback.

Issue # 2: Impacts to Riparian and Upland Soils

Introduction

The discussion of soil resources and potential effects uses existing information included in the Forest Plan and other project environmental analyses, including: the Ochoco National Forest Land and Resource Management Plan (USFS 1989), Deep Restoration EA (USFS 2004), Deep Vegetation Management EIS (USFS 2004), Deep Creek Watershed Analysis (USFS 1999), Deep Water Quality Restoration Plan (USFS 2001), and PACFISH/INFISH (1994/95), project specific resource reports, agency and scientific studies as well as site specific professional experience and judgment.

The Westside Allotments Environmental Analysis Project Area contains a wide variety of soils and landtypes. For a detailed description of the soils and landtypes in the analysis area refer to Soils Report, Table 1, in the analysis file. Additional land use interpretations and soil suitability information can be found in the Soil Resource Survey (SRI) for the Ochoco National Forest (Paulson 1977).

Affected Environment

Volcanic ash from Mount Mazama blanketed the area about 7,680 years ago and has been subsequently reworked by wind and water. Newberry Crater ash has also been deposited over much of the area but with much less depth. Ash soils occur on approximately 15,562 acres or 18.7% of the project area. The balance of the analysis area (67, 625 acres) is largely residual soil, which is clay-loam or clay texture. Much of the area is non-commercial ground and is scabland, sage, juniper, rock outcrop, low site ponderosa, or meadow.

This is classic scab-stringer country with lithic scabland soils on the plateau uplands. These old basalt flow surfaces are incised with steep-sided drain ways. Soils on these steep to very steep plateau drainages and lava flow scarps are moderately deep-to-deep on the northerly aspects and shallow to moderately deep on the southerly aspects. These drain way soils are derived from ash overlying or mixed with colluviums. The drain areas have served to collect wind and water-eroded ash from the scablands, which have lithic soils derived from basalt. These are very sensitive areas especially along the interface between scablands and forested stringer drain ways. Infiltration in the deep ash soils is rapid to very rapid but very slow on the scablands. These edge areas provide critical buffers that help slow down and dissipate the rapid runoff from the scabs (USDA 2004a).

In the last 120 years, the soils of this area have gone through significant changes, particularly in the drainages or historic erosional channels. These changes are related to human uses and the resulting impacts on soil resources. Logging, grazing, and road building from the 1880s to the 1940s altered erosional and soil development patterns on a spatial and temporal scale that was different from pre-European conditions. Natural erosional processes occurred without impacts from logging, roads, or bovine/equine influence. Belsky and Blumenthal (1997) contend that livestock grazing is a main contributor to an increasingly dense Western forest, due mainly to its effects on understory herbaceous plants and forest soil properties, such as organic matter, compaction, and infiltration rates. This issue was discussed by Borman (2003) who acknowledges that past

grazing practices, predominately sheep herds did contribute to dense Western forests. Borman also maintains that current grazing management practices do not significantly contribute to increased tree densities by over-utilization of herbaceous plants or significantly affecting forest soils; other management activities such as fire suppression and logging activities combined with favorable climatic conditions, especially during the early 20th century, helped promote tree regeneration. No sheep have been grazed in the project area since the early 1960s, but logging and fire suppression activities have continued, leading to ever-increasing stand densities.

Logging influences were minimal until the introduction of caterpillar type tractors in the 1930s. Increased use of caterpillar-type tractors, and eventually rubber tired skidders, resulted in much of the acreage below 30-40% slope being tractor logged. The cumulative forest-wide average from multiple entries and mechanized fuels treatment, resulted in 30-40% of previously harvested tractor ground being in a detrimentally compacted or displaced condition.

Over grazing, by livestock prior to the founding of the Ochoco National Forest, caused soil compaction, loss of effective groundcover, head cutting, post holing, and puddling. Some impacts occurred from elk but most were due to the concentrated herds of livestock, horses, and sheep. More recently, fenced grazing has altered the natural disturbance patterns and created different vegetative spatial and temporal patterns that existed before European settlement.

Current soil condition and apparent trend as determined by Condition and Trend Surveys, paced transects, riparian plots, and field observations indicates that upland soils are currently in fair/good condition with a general upward trend. Riparian soils are generally in poor to fair condition (no trend was determined for riparian soils). Livestock grazing has affected the soil resource most notably in areas where livestock are known to concentrate resulting in post holing, bank trampling, soil displacement, and soil compaction. Approximate soil disturbance amounts from known areas of livestock concentrations are listed in Table 10.

Table 10: Approximate Soil Disturbance by Pasture & Acres in the Westside Allotments Project Area, Paulina Ranger District

Allotment	Pasture	Acres of Soil Disturbance
Deep Creek	North	111
	South	33
Derr	East	12
	West	12
Happy	East	10.5
	North	2
	West	13
Little Summit		95.5
Roba	Dipping Vat	50
	Riparian	62
	Roba	83
	West	34
Fences		120.8
	Total	638.8
	Percent of Project Area	>1

Short-term (0-5 years) drought or wetter conditions now have significant impacts to overall ecosystem and soil health of the area. These short disturbance patterns can cause erosional events in natural surface conditions as well as accelerate erosion in disturbed areas such as roads and trails.

Environmental Consequences

Effects Common to All Alternatives: The effects common to all alternatives include a general susceptibility of soil loss due to past and present grazing use. The magnitude of the potential loss varies between alternatives. These allotments with a greater grazing intensity or with higher proportions of easily eroded soils have a greater potential for direct and indirect effects. The cumulative effects are also similar for each alternative, much like the direct and indirect effects. The magnitude of cumulative effects also varies by alternative. Management practices, constraints, and mitigation measures for soil, water, and riparian improvement should be considered under all action alternatives. All of the current alternatives affect the potential for riparian vegetation establishment and, thereby, have at least some impact on the soil resource in the short (0-15 years) or long-term (15+ years) or both. It is expected that the effects for the soil resource, as described for each alternative, would be similar for all allotments.

Effects common to Alternatives 2 and 3: This section contains excerpts from the Soils report in the Crooked River National Grasslands Environmental Impact Statement (David 2003). The following described effects to the soil resource from livestock grazing are universal across the landscape.

Direct effects to the soil resource include physical impacts such as compaction (a decrease in soil bulk density caused by livestock hooves reducing surface soil porosity). This causes reductions in water infiltration, percolation and air exchange in the soil. There is also an

increase in resistance to root growth. Detrimental compaction is defined as a 15% increase in soil bulk density for residual soils and a 20% increase in bulk density for ashy soils. As discussed below this effect is largely seasonal. These effects do have short-term impacts on overland flow, especially for summer thunderstorms. This may increase the runoff peak and cause more surface and bank erosion than on non-grazed soils. These effects are usually shallow, short lived, seasonal compaction on sandy loam textured surface soils.

Post-holing and plugging via hoof action shear the protective sod mats and create holes and mixing throughout, which induces a soil surface condition that is susceptible to rill and gully formation. Commonly, these areas appear hummocky and show signs of erosion in between the hummocks. This can be particularly damaging around wet meadows, springs, seeps, and streams.

Bank erosion is due to sloughing caused by livestock impacts. Hoof action, rubbing and wallowing commonly cause bank failure on streams with banks composed of fine alluvium such as sand, silt, clay, and gravels. This results in more sediment delivery to the stream, especially during high flow events.

The mixing and incorporation of organic matter into surface horizons has both positive and negative impacts. Mixing helps to incorporate and conserve organic matter. It also reduces the mulching effect, which may leave the soil somewhat less protected from wind and water erosion.

Microbiotic crusts are biological in origin and formed by communities of non-vascular plants, fungi, and other associated organisms. Microbiotic crusts and the closely associated vesicular crust (a platy surface crust, usually 1.5 to 3 inches which is formed by raindrop impact and contains vesicular pores) form a thin surface layer comprised of biotic and abiotic features. The vesicular crust along with the microbiotic crust (if present) provides a resistant layer to surface and rill erosion as well as wind erosion. Evidence points to microbiotic crusts being highly susceptible to degradation by intensive livestock trampling. Arid soils appear particularly vulnerable especially in regards to microbiotic crusts. These crusts are easily disturbed by livestock hoof action. This breaks up the crust and causes desiccation and increases susceptibility to wind and water erosion. Currently, no surveys for microbiotic and vesicular crusts exist in the Westside Allotments Environmental Analysis Project area.

Animal grazing behavior influences the distribution of nutrients to various landscape positions and may have an affect on soil microorganisms. Animals may graze in one area and move to another area to rest or drink. Dung and urine may thus be more plentiful in the resting area and around a watering place than in the grazing area resulting in a net transfer of nutrients from the grazed area to the resting and watering areas. Grazing promotes nutrient cycling through the rapid breakdown of organic matter into smaller particles in the system, so organic matter is more readily available for soil microorganisms, such as soil bacteria and fungi. Microorganisms use the organic matter as an energy source and can release nutrients back into the soil for plant uptake, thus, grazing may increase the rate at which nutrients cycle through an ecosystem. It may be argued that if nutrients are not bound up in soil or organic matter, then they are more vulnerable to being lost to the system.

Mycorrhizal associations and shrub-steppe habitat are closely interlinked and livestock grazing has the potential to affect the number and health of shrubs, thereby, also affecting

the mycorrhizal associations. In arid soils, shrubs establish themselves in patches or clumps and form "fertility islands". These islands are also sites of highest vesicular-arbuscular mycorrhizae (VAM) activity. These patches will be inoculum focal points from which vegetation and VAM can spread. With greater shrub establishment, adequate VAM inoculum will be concentrated to initiate mycorrhizae on later successional plants. The diversity and abundance of soil organisms is influenced not only by available food resources, but also by changes to physical and chemical properties of the soil.

Soil Carbon Cycling and Sequestration: The large areas occupied by grazing lands, the diversity of their climates and soils, and the potential to improve their use and productivity all contribute to the great importance of grazing lands in sequestering carbon and mitigating the greenhouse effect and other aspects of global climate change. Productive, sustainable grazing lands provide high-quality vegetation and soils, which lead to high rates of carbon sequestration and low levels of carbon dioxide (CO^2) emissions.

Vegetation and litter cover protects the soil surface from raindrop impact, slows runoff, and enhances infiltration. Reductions in the amount of vegetative cover, standing vegetation and litter results in less organic matter being incorporated into the soil, which is an important component of soil fertility and structure. As vegetative cover is decreased, there is the likelihood for increased levels of soil erosion and a downward spiral may be initiated, ultimately having a detrimental affect on Forest productivity and watershed health.

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: Under the No Action Alternative no added soil disturbance, detrimental or otherwise, would occur from livestock grazing. Overall, soil erosion levels would be reduced in both the short and long-terms. In the short term (0-15 years), soil loss would continue to occur in those areas that have been identified as having poor range condition or showing signs of soil loss (see Purpose and Need, Chapter One). This loss would decline over time with increases in plant density, plant vigor, and a shift in species diversity towards more desirable perennial grasses and forbs. The amount of vegetative ground cover would increase over what now exists under current conditions. Increases in vegetation would lead to the narrowing and deepening of streams. Trampling damage and streambank alteration would be reduced leading to a decrease in the percentage of bare-ground. Current estimates put soil disturbance at 640 acres across the project area, most of which is located along stream banks, fences, water developments, and at salting sites. Removal of livestock would potentially allow for a 100% reduction in new soil disturbance levels resulting from livestock. Damage to willows and other riparian vegetation would be reduced, however, elk and deer would continue to have some impacts on riparian vegetation.

Long-term (15+ years) soil productivity would increase due to decreases in sheet and rill erosion in areas where range condition and soil health are poor (see Purpose and Need, Chapter One). The current level of sediment transport and downstream sedimentation would be reduced. Riparian health and streambank stabilization would improve in the complete absence of impacts by livestock. Microphytic crusts would sustain less damage with the removal of livestock. Some damage would still occur from wildlife as these crusts are often found in wildlife winter range, primarily located in the South Pasture of the Deep Creek Allotment and the Roba Allotment. Fuel loading in the project area would continue to increase with an associated risk of higher severity wildfires and its potential affects on

the soil resource in the form of nutrient volatilization, exposed mineral soils, and water repellency. Long-term (15+ years) soil productivity would not be affected by these wildfires, as short-term (0-15 years) recovery would be expected because of the availability of the surrounding soil organisms and vegetation.

The removal of rangeland improvements and fencing may include minor disturbance to surface and subsurface soils. Minor amounts of soil loss and compaction are probable during removal of existing range improvements if such activity involves heavy equipment. This is likely to be very limited. This could cause short-term (0-5 years) sediment transport and changes to vegetation in areas where the surface soil is disturbed.

Cumulative Effects: Past and present management activities, such as domestic livestock grazing (sheep and cattle), timber harvest, fire suppression, prescribed burning, road building and maintenance, recreation and special uses all have contributed to degraded riparian and upland soil conditions.

Alternative 1 would potentially eliminate future livestock grazing impacts from the project area. Past grazing practices allowed unrestricted grazing, mostly by large numbers of sheep, to occur between 1880 and 1907. This resulted in changes in vegetation communities and soils that contributed to degraded riparian and upland habitats. Changes in livestock grazing practices, after the founding of the Ochoco National Forest, have allowed some improvement in vegetation condition, but historic impacts can still be seen and continue to contribute to current vegetation conditions. Conversion of land use from family based ranching operations to subdivided mini-ranches located adjacent to lands administered by the Forest Service could affect soils and vegetation in watersheds already impacted by other uses leading to decreased soil productivity, increased runoff and sediment loads in streams.

Past timber harvest activities including: the Deep Salvage Sale, 1995 (900 acres); Summit Timber Sale, 1996 (2,040 acres); Fryton/Rainier/Barn Timber Sale, 1992 to present (1,739 acres); and others had the potential to impact vegetation and soils leading to a change in habitat conditions and overall Forest productivity. There are both beneficial and detrimental affects associated with these types of activities. Precommercial thinning in and around riparian areas reduces the amount of conifer encroachment and opens the forest canopy allowing more sunlight to reach the forest floor. The increased sunlight combined with a reduction in competition for nutrients and moisture enhances understory woody and herbaceous vegetation. Livestock would have a tendency to congregate in areas that are producing more herbaceous forage and this could potentially have negative affects on both plant populations and soil conditions. Detrimental affects to soils conditions include soil compaction and displacement and creation of bare ground - all which can lead to increased rates of soil erosion and decreased forest productivity. Future vegetation management activities include: The Deep Vegetation Management Project (includes timber harvest) (6,300 acres); prescribed burning (8,500 acres); and road reconstruction/construction (25 miles). In the long term (15+ years), vegetation and soils would benefit from these types of projects, but short-term impacts to vegetation and soils would be expected.

Restoration projects such as those found in the Deep Creek Watershed Restoration Project have the potential to affect vegetation and soils in the short-term (0-15 years) by such projects as: large wood placement, cutbank revetment, pool habitat restoration, riparian exclosures, spring developments, and stream channel reconstruction. In the long-term (15+

years), these restoration activities would potentially improve both vegetation and soils by repairing headcuts, stabilizing streambanks, and decommissioning roads, ultimately improving overall watershed health.

Past and future road construction and yearly maintenance would continue to alter natural drainage patterns. This has the potential to affect riparian vegetation and its habitat by limiting floodplain interaction and thereby its function. Past and present projects that included road construction are: Summit Timber Sale, 1996 (6.0 miles); Deep Salvage Sale, 1995 (3.0 miles); Dippy Beaver Timber Sale, 1996 (3.7 miles); and Fryton/Rainier/Barn Timber Sale, 1992 to present (15.8 miles). Proposed road decommissioning projects included in the Deep Creek Watershed Restoration Project would potentially reduce these impacts and would improve riparian vegetation and its habitat.

Many of the streams in the project area benefited by the presence of beaver, which helped reduce stream velocity, increase sediment deposition, raise water tables, and promote riparian vegetation colonization and habitat expansion. Increased amounts of woody vegetation would likely lead to increased numbers of beaver. Natural hydrologic processes produce changes that are increased by the presence of beaver. As beaver build dams, sediment is deposited in the resulting ponds, which can raise the water table. This expands the riparian zone with more opportunities for riparian grasses, sedges, rushes, and shrubs to colonize and expand.

With grazing eliminated, the project area could become even more appealing, than it is now, for recreation. An increase in recreational use could lead to an increase in all types of human use. Impacts on riparian and upland areas from illegal off-road use may increase impacts to vegetation and soils leading to degraded watershed conditions and reducing forest productivity.

Increases in the amounts of fine fuels in the form of grasses, forbs, and accumulated litter would likely occur from the removal or reduction of livestock. In the case of prescribed fire found in such projects as: Summit Timber Sale, 1996 (8,000 acres); Dippy Beaver Timber Sale, 1996 (1,200 acres); and Fryton/Rainier/Barn Timber Sale, 1992 to present (2,704 acres), these fuels could be important in carrying a controlled burn. These same fuels, however, may be dangerous in the case of an uncontrolled wildfire. Increased fire intensity and duration can detrimentally affect soils and potentially affect riparian and upland vegetation.

It is likely that late-season unauthorized livestock use in the Riparian Pasture of the Roba Allotment would occur from neighboring allotments or private lands. This use is expected to be limited, as grazing management strategies have been implemented to detect and remove unauthorized livestock. Unauthorized livestock use has the potential to slow the recovery of vegetation conditions by consuming the vegetation after the growing season, which reduces the health and vigor of the plant. This would ultimately have a detrimental affect on the vegetation and soils; the degree would depend on the number of unauthorized livestock (averages approximately 30-40 head) and the duration of use (approximately 1-1.5 weeks).

***Summary*:** Alternative 1 would result in the quickest recovery of riparian and upland soil conditions because forage plants, streams, and soils would not be exposed to livestock grazing. This alternative would lead to soil conditions that would meet the Purpose and Need and move towards the Desired Conditions outlined in Chapter One. This would

result in more riparian species (both herbaceous and woody) being present with increasing density and vigor, resulting in increased stream bank stabilization, and reduced head cutting and sedimentation. Alone, Alternative 1 cannot be expected to fully meet the resource objectives nor provide resolution to all of the resource issues because the impacts from past, present, and future management activities would continue to, or have the potential to, affect the project area. Rates of recovery for both riparian and upland soils would be potentially slowed or reversed by other non-grazing associated activities that would continue to occur. Alternative 1 would potentially improve soil conditions in the project area more quickly than Alternatives 2 and 3.

Alternative 2 – Proposed Action

Direct and Indirect Effects: Because of the changes in grazing management, vegetative cover would increase on all upland and riparian areas, but soil disturbance in the form of trampling and streambank alteration would occur at a reduced level. Soil retention on both riparian and upland sites would be improved. Potential soil erosional loss would be reduced from current levels on riparian and upland areas that are known to be in poor condition (see Purpose and Need, Chapter One). The restoration of riparian soils and vegetation would occur in the long-term (15+ years). In the short term (0-15 years), soil loss would continue to occur in those areas that have been identified as having poor range condition or showing signs of soil loss. This loss would decline over time with increases in plant density, plant vigor, and a shift in species diversity towards more desirable perennial grasses and forbs.

The amount of vegetative ground cover would increase over what now exists under current conditions. Increases in vegetation would lead to the narrowing and deepening of streams. Trampling damage and streambank alteration would be reduced leading to a decrease for percentages of bare ground. Current estimates put soil disturbance at 640 acres across the project area, most of which is located along stream banks, fences, water developments, and at salting sites. Reductions in forage utilization levels and soil disturbance, outlined in Chapter Two, would potentially allow for a 25% reduction in new soil disturbance levels. Damage to willows and other riparian vegetation would be reduced, however, elk and deer would continue to have some impacts on riparian vegetation.

The indirect effects include an improvement of downstream water quality, reduction of sediment transport, enhancement of riparian vegetation, and improvement of long-term soil productivity on selected areas. Microphytic crusts would sustain less damage by livestock due to stricter utilization standards. Some damage would still occur from wildlife as these crusts are often found in wildlife winter range, primarily located in the South Pasture of the Deep Creek Allotment and the Roba Allotment. Forage production would increase in areas identified as having poor condition. Riparian vegetation diversity would increase.

Cumulative Effects: Cumulative effects are described under Alternative 1 and are applicable to this alternative as well. Under the proposed standards outlined in Chapter Two, these affects to riparian and upland vegetation would be positive, increasing the number, health, and vigor of the plant communities. This in turn would cause an improvement to soils in the long-term (15+ years). The cumulative effects would be similar to those described in Alternative 1, but likely to a greater extent or magnitude.

Summary: After Alternative 1, this alternative is the best for improving riparian and upland soil conditions. The proposed standards with this alternative, which meet Forest Plan Standards and Guidelines, would limit the exposure of forage plants, streams and soils to livestock grazing. Alternative 2 would also lead to soil conditions that meet the Purpose and Need and move towards the Desired Conditions outlined in Chapter One. This would result in more riparian species (both herbaceous and woody) being present with increasing density and vigor, resulting in increased stream bank stabilization, and reduced head cutting and sedimentation. Alone, Alternative 2 cannot be expected to fully meet the resource objectives nor provide resolution to all of the resource issues as the impacts from past, present, and future management activities would continue to or have the potential to impact the project area. Rates of recovery for both riparian and upland soils would potentially be slowed or reversed by other non-grazing associated activities that would continue to occur.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects: Under this alternative grazing management would continue as permitted without additional requirements for protecting or improving the soils resource. Current grazing management practices have not adjusted forage utilization levels to current conditions. Soil erosional loss on allotments that are in fair to poor range condition would continue in the short-term (0-15 years). In the long-term (15+ years), this loss would continue as vegetation conditions decline. Riparian areas identified as Non-functioning or Functioning-at-Risk would continue to show signs of soil loss and limitations of woody riparian vegetation growth unless they were addressed under separate programs and practices.

The indirect effects would be a loss of long term soil productivity on allotments and areas that have a fair to poor range condition or vegetative cover (see Purpose and Need, Chapter One). The current or an increased level of soil transport and sedimentation would occur. Downstream sediment loads would remain the same or increase. Microphytic crusts would continue to sustain damage by livestock. Some damage would still occur from wildlife as these crusts are often found in wildlife winter range, primarily located in the South Pasture of the Deep Creek Allotment and the Roba Allotment. Forage potential would likely decrease in areas in poor rangeland condition (see Condition and Trend surveys, paced transects, and riparian plot data available in the analysis file and Table 1, Chapter One). Riparian areas in poor or degraded condition (see Riparian Plot data available in the analysis file) would continue unnatural bank erosion and require greater periods for recovery to a Properly Functioning condition. Riparian vegetation diversity would decrease or remain the same depending on current site conditions. Current estimates put soil disturbance at 640 acres across the project area, most of which is located along stream banks, fences, water developments, and at salting sites. Under current management standards these levels are expected to remain the same.

Cumulative Effects: Cumulative effects are described under Alternative 1 and are applicable to this alternative as well. Under the Current Management Standards outlined in Chapter Two, these affects to riparian and upland vegetation would result in decreasing the number, health, and vigor of the plant communities. This in turn would cause a decline in

soil conditions in the long-term (15+ years). The cumulative effects would be similar to those described in Alternatives 1 and 2, but likely to a greater extent or magnitude.

Summary: After Alternative 1 and 2, Alternative 3, as currently implemented, is the least likely to improve riparian and upland soil conditions. Alternative 3, as currently implemented, would lead to declining soil conditions and would not address the Purpose and Need nor meet the Desired Conditions outlined in Chapter One. This would result in a decline of riparian species (both herbaceous and woody) being present with less density and vigor, resulting in decreased stream bank stabilization, and sedimentation with increases in head cutting.

Alone, Alternative 3 cannot be expected to fully meet the resource objectives nor provide resolution to all of the resource issues because impacts from past, present and future management activities would continue to or have the potential to impact the project area. Rates of recovery or decline for both riparian and upland soils would potentially be affected by other non-grazing associated activities that would continue to occur, thus, riparian and upland conditions would improve (at a much slower pace), remain the same, or deteriorate from present conditions. Alternative 3 would improve soil conditions in the Westside Allotments Project Area slower than Alternatives 1 and 2.

Issue # 3: Noxious Weeds

Affected Environment

For the purpose of this analysis a qualitative discussion of noxious weed spread will be provided. The existence, introduction, and spread of weeds are difficult to quantify and attribute specifically to any one vector on a landscape. As a result, this effects analysis will provide a qualitative assessment of the alternatives on the potential for weed spread as a function of: 1) Current existence of weeds within an allotment; 2) Livestock as a physical vector of introduction and spread; and 3) Livestock effects on native plant communities and the susceptibility for weed introduction. Most noxious weed infestations begin on disturbed areas, such as road shoulders, harvest landings, and at recreation sites

All animals (domestic and wildlife) can transport viable weed seeds in their digestive tract or attached to their hair and hooves (Parks et al 2004). Areas of soil disturbance or overgrazed areas are more susceptible to weed establishment than areas occupied by healthy native vegetation (Hann et al 1997). All but one of the pastures in the Westside Allotments Environmental Analysis Project Area are considered either Non-functioning or Functioning-At-Risk due to early seral vegetation and the amount of soil disturbance, especially in riparian areas. Noxious weed presence is a symptom of deteriorating rangeland health. A goal of this project is to improve the function of rangeland plant communities through improved grazing standards.

Noxious weed populations within the Westside Allotments are considered high compared to the rest of the Paulina Ranger District. Population, as used here, describes a noxious weed occurrence, which can be as small as one plant, to as large as thousands of plants but spatially separated from other occurrences. Currently, there are 161 populations encompassing 918 acres (1% of the project area). See Table 11 for a list of weeds present. These weed sites range from a handful of plants, acres of scattered individuals, to areas

with complete noxious weed cover. Extensive weed inventories have been completed in the Roba and Happy Allotments; other allotments have some inventories through project botanical surveys, Crook County Weed Control, and Forest Service personnel travel within the allotment areas.

Table 11: Noxious Weed Occurrence within the Westside Analysis Area

Species	Common Name	Morphology	Acres
Acroptilon repens	Russian knapweed	Perennial with adventitious root buds	0.1
Cardaria draba	Whitetop	Rhizomatous perennial	0.2
Centaurea biebersteinii	Spotted knapweed	Short-lived perennial	56.9
Centaurea diffusa	Diffuse knapweed	Herbaceous annual to perennial	25.3
Cirsium arvense	Canada thistle	Perennial with adventitious root buds	3.3
Cynoglossum officinale	Houndstongue	Herbaceous biennial or short-lived perennial	823.1
Dipsacus fullonum	Teasel	Herbaceous biennial	1.7
Hypericum perforatum	St. John's-wort	Rhizomatous perennial	0.3
Linaria dalmatica	Dalmatian toadflax	Perennial with adventitious root buds	0.2
Potentilla recta	Sulfur cinquefoil	Herbaceous perennial	0.4
Cytisus scoparius	Scotch broom	Perennial, evergreen shrub	0.01
Taeniatherum caput-medusae	Medusahead	Annual grass	6.5
Total			918.0

The morphology of noxious weeds determines how a plant reacts to different control methods. Hand-pulling whitetop, Russian knapweed, dalmatian toadflax, St. John's-wort, and Canada thistle is not effective. These are species that increase in density using manual control because new plants form from any root segments left in the soil after pulling the mature plant. Teasel and common houndstongue are biennial plants that can be reduced in numbers with diligent, twice-yearly manual pulling. Medusahead can be controlled by diligent hand pulling; however, it is impractical due to the fact that it is a grass. Spotted and diffuse knapweed, sulfur cinquefoil, and scotch broom are perennial plants that have deep root structures and do not respond well to manual control. Only 77 of the 918 acres present in allotments can be treated with herbicides under the current authority of the Weed EA. Weed populations discovered or introduced after 1998 cannot be controlled with herbicides. Table 12 lists the weed species and acreage by allotment.

Happy Allotment

The Happy Allotment has several large knapweed infestations (31.6 acres total) that were introduced around 1995 and their locations coincide with logging activities. Of the 31.6 acres, all but five acres have been treated annually with herbicides and the populations have decreased to a few scattered plants. Teasel populations were also treated successfully in the past with herbicides. Today, there are normally less than ten plants that germinate each year, which are hand-pulled. Canada thistle populations are stable at this time and are being monitored but not treated. Extensive surveys for noxious weeds have occurred in this allotment.

Derr Allotment

There are no known noxious weed populations in this allotment. Major roads within the allotment are surveyed each year.

Deep Allotment

The Deep Allotment has the highest knapweed population of any area on the Paulina Ranger District. Based on the year of establishment and location, it is assumed that these populations were introduced by timber harvest operations. These populations have been treated each year since 1998 with herbicide. All of the knapweed sites in the Deep Allotment are contained and, in 2004, only 13 ounces of herbicide were applied on 50 acres. Houndstongue has recently increased within this allotment. Vehicles, traveling the connected road system between the Roba and Deep Allotments, are likely spreading the weed from the Roba Allotment. Spread may also be caused by livestock coming from the Roba Allotment and introducing seed attached to their hair.

Canada thistle is of a growing concern because it readily grows in riparian zones and has the ability to form large patches. There is no effective manual or mechanical control of this species. Biological control of Canada thistle is being tried elsewhere on the Paulina Ranger District with some success. Other species of noxious weeds in this allotment have few occurrences, and are of a low acreage. The vast majorities of these species occur along road shoulders and are being treated manually when possible.

Little Summit Allotment

There are numerous small populations scattered along road shoulders throughout this allotment. The populations are stable and those conducive to manual treatment (knapweed) are being treated annually.

Roba Allotment

A combination of factors including past disturbance, grazing pressure, and declining native plant communities have resulted in an extensive and aggressively growing noxious weed problem within this allotment. Roughly 4% of the acres in this allotment are infested with noxious weeds, compared to 0.1 % of the other allotment acreages. The main weed of concern is houndstongue. It is uncertain how the plant was introduced but it is possible that it came in on logging equipment in the early 1980s. Extensive surveys for noxious weeds have been done in this allotment.

This allotment had extensive disturbance over the years through timber sales, road building, and prescribed burning resulting in large amounts of bare ground, soil compaction, and disruption of native plant community function. In addition, an administrative decision in 1995 allowed the Deep and Roba Allotments to run together since the same rancher holds both permits. This means, currently, there are 436 Animal Units per Month (AUM's) on the Roba Allotment, which has a designated carrying capacity of 236 AUM's. The Roba landscape is primarily low elevation, southerly exposure Ponderosa pine/western juniper timber type, broken up by extensive scablands. This area is the driest of the allotments with an average annual precipitation of only 17 inches per year, yet has the longest grazing season (6/16-10/15) of all the allotments. The Roba Allotment is also supposed to be administered as a rest-rotation grazing system, which it has not been since at least 1995. Resting each pasture every third year would

allow native vegetation to recover from grazing by fully utilizing all available moisture during the year, which is important to plant vigor in this dry climate.

The presence of noxious weeds on rangeland is also an indication that native plant communities are in an at-risk condition from a health and sustainability viewpoint due to their aggressive nature (O'Brien, et al 2003). The Roba houndstongue populations are not just along road shoulders; the plant has a stronghold in riparian areas and is moving to the uplands. In addition to noxious weeds, there are non-native, weedy plant species that dominate the non-forested areas within this allotment. Personal observations of the area over the last five years determined that non-priority weeds such as cheatgrass, bulbous bluegrass, and ventenata grass are competing heavily with native species, indicating these areas are at risk of invasion by aggressive noxious weeds such as medusahead.

Presence of medusahead in this allotment is also of a concern because it is an aggressive invader of grasslands that can out-compete cheatgrass. The seed heads have long awns that attach to animal hair and are easily transported by wind. The seed heads also have a high silica content, which does not decompose readily, forming a dense mat on the ground allowing for it to reproduce but excluding other vegetation.

Very few sites within the Roba Allotment can be treated with herbicide due to lack of environmental analysis, however, hundreds of acres of houndstongue are being treated manually each year using partnership funding. In addition, two pastures within the Roba Allotment, the Riparian Pasture and the West Pasture, have been rested from grazing since 2002 to facilitate control efforts and reduce the spread of weeds.

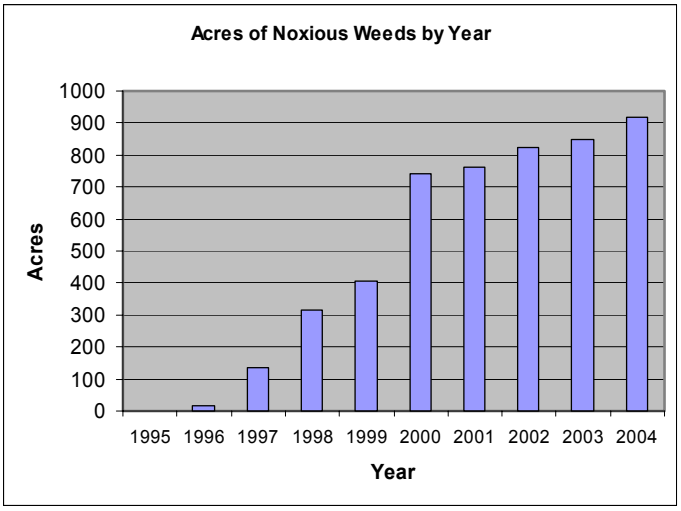
Table 12: Acres of Noxious Weeds by Allotment

Weed Species	Happy	Derr	Deep	Little Summit	Roba
Russian knapweed			0.1		
Whitetop					0.2
Spotted knapweed	26.5		50.1	0.1	
Diffuse knapweed	5.1		0.1	0.1	0.2
Canada thistle	0.5		0.6	1.3	0.9
Houndstongue			0.7		822.4
Teasel	0.1				1.6
St. John's-wort			0.1		
Dalmatian toadflax			0.2	0.2	
Sulfur cinquefoil			0.3		0.1
Scotch broom			0.01		
Medusahead					6.5
Total	32.2	0	72.21	1.7	830.8

Adjacent lands

Noxious weed presence outside of the project area is also important due to the way weeds are spread from long distances through vectors such as vehicles and wildlife. North of the project boundary, there is an extensive knapweed population along the 1200 Road on private land; spot infestations show up regularly on the District from this population. At this time, the area is frequently monitored and weeds are controlled through manual removal. West of the project boundary is the Lookout Mountain Ranger District, which like the Westside Project Area, has numerous noxious weed species along roads that could be transported to the project area. South of the project area are lands administered by the BLM and private land and both have extensive houndstongue populations. The majority of private land adjacent to the lands administered by the BLM land is owned by the rancher that has the grazing permit for the Roba Allotment, making control efforts and risk quite complex since livestock movement rotates between private land, and land administered by the BLM and Forest Service land. As seen in Diagram 2, noxious weed infestations are steadily growing within the Westside Allotment project area. Treatment options on the majority of sites are limited to manual control. The Ochoco National Forest is currently in the process of developing an environmental analysis to propose herbicide treatment on many sites present within the Westside Allotments. Concurrently, there is also a proposal in progress that would introduce a broader range of more selective herbicides to be used for the Pacific Northwest Region.

Diagram 2. Noxious Weeds in the Westside Allotments Project Area



Environmental Consequences

Introduction

Effects analysis of the alternatives assumes that weed infestations covered under the 1998 Weed EA will continue to be treated each year with herbicide as needed. Treatment of some infestations not covered under the Weed EA would be treated by manual methods when that method is effective. Based on data since 1995, over the last nine years the Paulina Ranger District has been averaging 38 new weed sites per year, and two new weed

species per year. The rate of spread of existing sites depends on species and type of treatment. Weed sites treated with herbicides decline, weed sites left untreated increase, and those treated manually increase slowly or remain stable depending on the species (Paulina Weed Monitoring Database 2004). This analysis uses current practices concerning number of livestock on each allotment, season of use, and pattern of use.

The cumulative effects analysis area for noxious weeds is larger than the project area. Vectors not confined to an area, such as animals, wind, and human activity, all transport weeds. The analysis will be based on lands within the Paulina Ranger District, adjacent lands administered by the Forest Service and BLM, and private lands.

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: The No Action Alternative cancels Term Grazing Permits within two years. No livestock grazing would take place within the project area. This would result in a decline of acreage occupied by noxious weeds throughout the planning area. This alternative would also allow the most recovery of native plant communities in the short-term of all the alternatives.

For most noxious weeds to become established there needs to be a vector of introduction and a receptive seed bed, usually bare ground or a non-vigorous native plant community. This is a primary reason why weeds become established along roadsides, vehicles being the vector and the bare road shoulder the seed bed. Under Alternative 1, livestock, which can be a primary vector of weed spread, would be removed and less ground would be disturbed. Native plant community recovery as a result of rest from grazing pressure indirectly affects the amount and establishment potential of noxious weeds. Each allotment would respond differently to recovery potential and timeframe. Each allotment is analyzed below addressing livestock as a vector of weed spread and vegetation recovery.

Happy Allotment: Livestock are a minor concern as a vector of the spread of existing noxious weed populations. The potential for livestock to spread 0.5 acres of Canada thistle is eliminated in this alternative. Noxious weed treatment would continue under this alternative. There are a few large diffuse and spotted knapweed sites which are treated with herbicide each year, and are considered controlled with very few plants emerging each year.

Plant recovery after the elimination of grazing and continued weed treatment would result in fewer acres of noxious weeds. This allotment lies on the north end of the project area and receives a high amount of rainfall (19” – 25”). It is one of the most productive sites on the Paulina Ranger District. Climate plays an important role in vegetation recovery after livestock grazing pressure is removed. Mesic sites recover faster (Belsky and Gelbard 2000, Hann et al 1997). The north pasture is considered to be Properly Functioning, and the east and west pastures on the high end of Functioning-at-Risk (close to Properly Functioning). Clary and Webster (1989) summarize that, in general, vegetation recovery after grazing elimination occurs within 5 to 15 years. Based on current vegetation condition and moisture regimes within this allotment, it is within reason that all pastures would be considered as Properly Functioning in the short-term (less than 15 years). This would be beneficial in terms of reducing the risk of noxious weed establishment. Native plant communities would increase in vigor and be more resilient to noxious weed invasion.

Rest from grazing results in plants having the ability to produce seed for propagation, maintain healthy carbohydrate levels (which improves survival during precipitation fluctuations), and allows litter accumulation sufficient for soil protection.

Derr Allotment: There are no noxious weed sites within this allotment; therefore livestock are not a vector of weed spread. Implementing the No Grazing alternative would reduce the risk of noxious weed introduction as livestock can transport noxious weed seed in their hair and hooves when trucked into the area.

Livestock have seemingly not been a vector of noxious weed introduction to date; eliminating grazing would reduce the risk and allow vegetation recovery to a sustaining functional condition which helps compete against noxious weed invasion. This allotment also lies on the north end of the project area, with most of the area getting 23" – 25" of rainfall per year. The pastures are rated as Functioning-at-Risk, with upland vegetation in poor condition, especially in dry meadows. Soils in these areas, however, are in fair to good condition with an upward trend, and vegetation species composition and density should improve (with the implementation of this alternative?). As with the Happy Allotment, recovery is estimated to occur in the short-term (15 years) for the uplands. Recovery of riparian areas may take longer, as there are factors other than vegetation which play a role in recovery, such as channel morphology and water flow regimes. Little is known about the recovery times for these factors (Clary and Webster 1989).

Deep Allotment: Noxious weed infestation in this allotment is increasing each year, with houndstongue and Canada thistle of the most concern. Eliminating livestock grazing would eliminate an important vector of weed introduction and spread. The livestock that graze this allotment come from the Roba Allotment (after grazing it first) which has a significant houndstongue infestation. Livestock are known to transport houndstongue seed in their hair and hooves (De Clerck-Floate 1997).

Under this alternative the acres of noxious weeds would decrease as plant communities recover from grazing and gain increased resilience to disturbance. The allotment lies in the middle of the project area with topography defined by a vast series of fault lines and stream channels resulting in "scab-stringer" vegetation. Most of the conifer-dominated vegetation types lie along valley slopes and along faults with grass-dominated vegetation in between. Scablands are too dry for houndstongue establishment, however, stringer vegetation, especially when in poor condition, is vulnerable to noxious weed invasion. Both pastures in this allotment are rated as Functioning-At-Risk due to the degraded condition of riparian areas. Monitoring plots in the upland areas show that vegetation communities are on an upward trend. Vegetation recovery in the riparian areas would presumably take place over the long-term, more than 15 years, even with the elimination of livestock grazing.

Little Summit Allotment: Eliminating grazing would reduce disturbance and the spread of noxious weeds but not to any considerable level due to the low amount of weeds present in this allotment. The possibility of new weed introduction from seed being brought in on hair or hooves or within the digestive tract of livestock would be removed.

The risk of weed introduction would decline under this alternative and plant communities would recover slowly. This allotment is rated as Functioning-at-Risk with scabland areas in poor condition with a downward trend for both vegetation and soils. Eliminating livestock grazing would allow vegetation recovery and help reverse the downward trend; recovery may take more than 15 years. Vegetation, being in poor condition, increases the

potential for large scale noxious weed invasion. This allotment is adjacent to Roba, further increasing the risk of weed movement by proximity.

Roba Allotment: Eliminating livestock grazing would immediately remove the greatest vector of noxious weed spread in the Roba Allotment. This allotment has the longest grazing season and the highest permitted number of cows of all the allotments in the project area. In addition, it has been a common practice since 1995 to operate the Deep and Roba Allotments together, increasing the number of cows to 436 cow/calf pairs. Length of time on the land and the number of livestock increase the risk of weed spread. With the addition of 200 more cows, the potential for noxious weed spread through contact nearly doubles, especially when houndstongue is the weed of concern. This allotment has a large infestation of houndstongue and several sites of medusahead. Both of these weeds have the potential to dominate the landscape. Livestock are important dispersers of houndstongue seed; the barbed seed of houndstongue attaches to animals when they brush against mature plants. They are not only efficient at picking up ripe burrs from standing plants but within a relatively short period can lose accumulated burrs while in the same area or within a different pasture (De Clerck-Floate 1997). Accumulation of burrs on livestock is directly related to the density of houndstongue within an area and the stocking density (number of cows) within the area (De Clerck-Floate 1997). In other words, the more cows grazing within a houndstongue infested area, the more accumulation and spread of burrs.

Removal of livestock grazing would result in immediate increases in standing plant litter material and plant vigor. Vegetation communities in good condition (Functioning) have greater ability to recover following disturbance. Soils with good vegetation ground cover have greater water holding capacity, higher microbial activity, and higher fertility. Bare ground attributed directly to livestock effects would recover, becoming established with native perennial plants, thus reducing the amount of available seed bed for noxious weeds. Houndstongue photo point monitoring on four areas along Burnt Corral Creek in the West pasture of the Roba Allotment shows some increase in native plant cover after three years of rest and noxious weed treatment, however, much of Roba's upland and riparian plant communities are in poor condition, which will slow recovery rates. Successional advancement might not be realized under a no-grazing scenario when areas have an abundance of non-native plants (Hann et al 1997). Recovery of native plant communities is paramount to the success in reducing noxious weeds. Although the No Action Alternative would remove a major vector of spread and would allow vegetation recovery, this period of recovery may take decades, far beyond 5 to 15 years as stated in the literature. Despite no grazing, it is expected that the houndstongue population in the Roba Allotment would continue to spread.

Livestock grazing over decades results in repetitive overuse in some areas. Over utilization of forage reduces plant vigor, which results in a decrease in litter accumulation, which in turn reduces site productivity and soil fertility. Perennial bunchgrasses, such as Idaho fescue and bluebunch wheatgrass, do not have high seedling vigor nor do they readily recover from grazing (DiTomaso 2004).

Cumulative Effects: Past management activities including timber harvest, prescribed burning, road construction, hunting, and livestock grazing have contributed to the introduction and spread of noxious weeds. Most infestations occur along major travel routes, indicating vehicles are the primary vector. Some larger knapweed infestations

described under the Existing Condition section coincide with logging operations. A large area of houndstongue infestation, discovered in 1998, occurs along a road leading from lands administered by the BLM and covers a riparian area which was logged many years ago. Since then, inventories found houndstongue across the Roba Allotment growing at a rapid rate. The amount of timber harvest in the Roba Allotment may have contributed to declining plant community health. Extensive overstory removals by the Indian and Hewed Log Timber Sales occurred in 1989 and 1991 and included skid trail construction within riparian areas. There are many landing sites and other disturbed areas associated with these timber sales throughout this allotment. Most of these disturbed areas are still bare ground today. The Dippy Beaver underburning project, completed in 2002, also contributed to noxious weed spread.

The Westside Allotments are connected by riparian corridors, an extensive road system, and in the case of Deep and Roba Allotments, livestock. These cows are herded in from BLM and private lands into the Roba Allotment, and later in the season, into the Deep Allotment and back again. In addition, several major entry sites to National Forest land occur in the project area. The 1200 Road provides access to State Highway 26; the 3000 and 4200 Roads are main access points from the Lookout Mountain District. The Roba Allotment borders private land and BLM land. Transient big game populations and public recreation also travel throughout the area. This connectivity increases the potential for noxious weed spread and introduction within the project area. Wildlife, such as deer and elk, also may contribute to houndstongue seed dispersal, although it is suspected that their role as dispersers is minor relative to that of livestock (De Clerck-Floate 1997).

The Ochoco National Forest Weed EA provides treatment opportunity for weed sites established before 1998. There is no provision for herbicide treatment of weed sites established after that date. In the Westside Allotments, there are 661 acres of new weed infestation that can only be treated by manual means, which is not the most efficient or effective method of control and in many cases can make infestations worse. The No Action Alternative would be a positive prevention measure for reducing the spread of noxious weeds, which is important since noxious weed control measures are limited.

Unauthorized and trespass grazing from private land and adjacent allotments is expected to continue in the Roba Allotment. Trespass use in the riparian pasture along the North Fork Crooked River has been documented nearly every year since 1999. Houndstongue is beginning to take hold within this pasture. Livestock would continue to be a vector of spread even if grazing is not permitted in the Roba Allotment. Other on-going activities include recreation, off-highway-vehicles, road maintenance, and fire suppression, all of which have the potential for noxious weed introduction.

Future activities planned within the project area include: 1) The Deep Vegetation Management Project which will harvest 6,300 acres of timber, prescribe burn 8,500 acres, carry out 25 miles of road reconstruction and construction, and place large woody debris using heavy equipment on 7 miles of stream. These projects would occur in all but Roba and the North Pasture of Happy Allotments. 2) The Deep Restoration Project concentrates on physical improvements within stream channels including culvert replacements, large wood placement, cutbank revetment, pool habitat restoration, and stream channel reconstruction. 3) Fryton and Barn prescribed burning, approximately 2,000 acres. All of the above activities have the potential to introduce noxious weeds and spread existing

noxious weed populations through vehicle traffic, heavy equipment use, and the creation of bare ground. Logging leads to forest fragmentation and creates patches of open habitat that are susceptible to weed invasion (Kimberling et al. 2003). Mitigation measures were developed to reduce the risk of weed spread. Several actions planned will help reduce the potential for noxious weed spread in the long-term, including 63 miles of road closures and stabilizing stream banks resulting in less erosion and more stable plant communities. All of the future activities include prevention measures to reduce the potential impacts of noxious weeds.

The Ochoco NF is currently working on an environmental assessment for the treatment of noxious weeds. This effort would tier to a programmatic Environmental Impact Statement (EIS) being developed at the Regional level. The Regional EIS would give Forests the ability to use newer herbicides, while the local EA would be site specific analysis for treatment of all weed sites on the District. Having the ability to choose the most effective herbicide based on noxious weed species, and the ability to treat all known infestations, if necessary, would reduce the spread potential of weeds. Funding and litigation issues may delay these control efforts by several years.

Summary: Eliminating grazing under the No Action Alternative would reduce the potential for spread and introduction of noxious weeds. Livestock, a vector of weed spread, would be removed. In the Happy, Derr and Little Summit Allotments, livestock are a minor vector, while in the Deep and Roba Allotments livestock are a primary vector of weed spread. Native vegetation recovery would occur fairly quickly (5-15 years) within those pastures rated Functioning-at-Risk. The pastures rated as Non-functioning in the Roba Allotment may take decades for native plant community recovery. The elimination of grazing would hasten the recovery timeframe. Noxious weeds would continue to become established, by vectors such as vehicle traffic, throughout the allotments.

Alternative 2 – Proposed Action

Direct and Indirect Effects: This alternative proposes new management standards based on rangeland condition to improve conditions within the five allotments. These standards require less forage utilization, less soil disturbance, and higher stubble height requirements at the end of the growing season. Pastures in Properly Functioning condition (currently, North Happy) have standards similar to current Forest Plan standards. Less utilization of vegetation results in greater standing plant biomass that would convert to litter; this can reduce the amount of bare ground on a site. Alternative 2 also proposes a soil disturbance standard for shrub and grassland communities that range from 0 to 20% depending on the condition of the land. A Non-Functioning pasture would be allowed a 0 to 9% livestock-created soil disturbance. This standard is expected to result in less bare ground susceptible to noxious weed invasion in the uplands. Alternative 3 does not include this standard.

Mitigation measures to help prevent noxious weeds are the same for both action alternatives. These measures mostly include education materials and maps of weed sites for permittees. One measure of note describes keeping livestock in a small holding area when coming from a pasture infested with noxious weeds to allow seed passage through the digestive tract (and to fall off hair and hooves). When implemented, this would reduce the effect of livestock spreading weeds, especially houndstongue.

Happy Allotment: The proposed, more stringent, management standards with this alternative would not affect livestock as a vector of noxious weed introduction and spread in the short-term because the same numbers of cows are expected to graze this allotment. There are several Canada thistle sites that are not controlled where it is possible livestock may spread seed while walking through the area. Adaptive management strategies, such as fencing out large weed populations, would be put into place if necessary, which would eliminate livestock as a vector of spread.

Native plant communities would benefit from the proposed standards. For example, the East and West Pastures are rated as Functioning-at-Risk, which means utilization rates would be 20 to 39% versus 45 to 55% under current standards. This would leave more standing plant material, which increases plant litter and gives the plants more opportunity for photosynthetic recovery. Stubble height in riparian areas would also increase from 4 inches to 5 inches with the same results. These pastures are on an upward trend (Palmer, 2004) and the proposed changes are expected to accelerate this trend in the long-term, increasing resilience to disturbance and noxious weed invasion.

Derr Allotment: Currently, there are no known noxious weed sites within the Derr Allotment; therefore livestock are not a concern for weed spread. It also appears that livestock have not been a vector of introduction to date. This is not expected to change under the Proposed Action.

Both pastures within this allotment are considered Functioning-at-Risk. In particular the dry meadow sites and low sagebrush sites are showing poor vegetative composition in either a static or downward trend. These sites are also susceptible to noxious weed invasion due to soil characteristics (shallow clay), however, monitoring shows an upward trend for soil stability and productivity. Less utilization as described above would hasten the vegetative trend to move in the same direction.

Deep Allotment: Livestock as a vector of noxious weeds would not change under the proposed management standards, and are expected to continue to spread and introduce noxious weeds. There is a substantial infestation of houndstongue in the Roba Allotment that is growing rapidly and cows from the Deep Allotment graze there first, and then move into the Deep Allotment. A 1997 study by De Clerck-Floate determined that livestock with houndstongue burrs on their faces in June and July had lost them by August. By grazing Roba first in the spring, livestock are picking up last year's mature seed burrs and are transporting them into the Deep Allotment. Houndstongue occurrence in the Deep Allotment is increasing. Since 1995, there has also been a practice of grazing the combined number of cows, 436 pair, in both allotments. This greatly increases the risk of transporting and depositing seeds by having twice as many cows as is permitted. Under the Proposed Action the Roba Allotment would be rested for three years, and during this time these practices would not occur, which would reduce weed spread potential in the immediate future.

The adaptive management strategy of Alternative 2 is expected to promote native plant community recovery within riparian areas in the Deep Allotment. Both the north and south pastures are rated as Functioning-at-Risk. Monitoring shows that the upland plant communities are Properly Functioning, however, the riparian areas are not meeting desired conditions (the south pasture is near Non-functioning). The ability to choose utilization

percentages, stubble height, and rest if needed for areas not moving towards desired conditions would help show improvement in the short-term. The proposed standard of 20 to 39% utilization in Functioning-at-Risk pastures fits with data suggesting that 24 to 32% utilization of riparian graminoids equaled a residual 6 inch stubble height, which may be the minimum necessary to protect riparian function (Clary and Webster 1989). For example, within the south pasture along Deep Creek and Big Springs Creek, this alternative gives the opportunity to choose utilization at 20% which would result in a higher residual stubble height than 6 inches. This would help move toward desired conditions and an upward trend, resulting in more resilient riparian communities, which would be less susceptible to noxious weed invasion.

Little Summit Allotment: Currently, there are no indications that livestock act as a principal vector of noxious weed spread or introduction into the Little Summit Allotment. Weed populations in this allotment are low and are mostly associated with roads. Most weed sites occur along road shoulders, with a few occurring at culvert areas such as Little Summit Creek at the 4276 Road where livestock congregate. Livestock may spread existing Canada thistle populations by breaking stalks and dislodging seed from walking through it.

Implementing the proposed standards would move sagebrush and riparian communities, currently in a downward trend (Palmer, 2004) to a slow, upward trend in the long-term (>15 years). The difference in utilization rates for Little Summit between Alternative 2 and Alternative 3 are not as great as other allotments because there are no pastures. Therefore, recovery rates may be slower than other allotments with more options such as staggered turn-on and rest of pastures. With adaptive management, if the plant communities do not show an upward trend, the lower end of the utilization standards, 20%, could be implemented, accelerating recovery time. Although noxious weed populations are low at present, a great portion of this allotment has grass and shrubland on shallow clay soils, which are very susceptible to invasion, especially by species such as medusahead.

Roba Allotment: Part of the Proposed Action is to rest Roba Allotment for three years. This would eliminate livestock as the primary vector for spreading houndstongue within the allotment during this period. As explained above under the Deep Allotment, nearly twice the permitted numbers of cows graze within this allotment, greatly increasing the probability of seed spread. This allotment has seen a sixteen-fold increase in houndstongue population in seven years, which is approximately a 50% increase each year. The West pasture of Roba has been rested for three years to facilitate manual control efforts. This has proved to be effective. Initial treatments concentrated along Burnt Corral Creek in the West pasture; weed density has decreased and noxious weeds have increased by only 11 acres in three years. This is in contrast to a 186 acre increase in the rest of the allotment during the same time period. Resting the entire allotment would increase the efficacy of weed treatment, however, due to the current size of the houndstongue population, lack of funding for weed treatment, and the fact that manual control is the only method available, the population is expected to continue growing.

Native plant communities in the Roba Allotment have been altered and are not meeting desired conditions. As a result, noxious weed populations have moved beyond roadsides and have invaded riparian areas and forested uplands. Irwin et al. (1994) explored the concept that long-term herbivory in the Blue Mountains may have reduced economic

carrying capacities, and that trends in productivity may be masked by precipitation variation. They conclude that the current plant-herbivore subsystem is probably not stable, and objectives should be evaluated carefully for densities of domestic herbivores (and big game). Achieving stated goals of rangeland improvement in the Purpose and Need is more likely when tailored to landscapes.

The dry, south-facing, dissected ecosystem of the Roba Allotment, presently in a Non-Functional condition, would not reach a desirable condition under the high end of the utilization standards of 19%, especially considering the late season grazing of riparian areas allowed in Roba (until October 15). High levels of utilization after plant maturity does not allow for plant re-growth and recovery, resulting in diminished canopy cover and water storage during the winter, which will not sustain plant growth over long durations (Hann et al. 1997, Parsons et al. 2003). Even under complete rest, an option of this alternative, areas within Roba with concentrated noxious weed populations are unlikely to change in species composition and density fast enough to make a difference in weed populations.

Cumulative Effects: Past and future actions affecting noxious weed populations within the Westside Project Area are described under the Alternative 1 cumulative effects section. The project area ranges from allotments with very few noxious weeds to an allotment with a rather large infestation, all occurring within a variety of ecosystems. Obviously, livestock impacts, both as a physical vector of spread and herbivory effects on native plants, would be different across the project area. Due to current vegetative conditions, rangeland would recover from the cumulative effects of disturbance such as timber harvest, fire, road construction and long-term livestock use at a slower rate under a grazing scheme compared to no grazing. The longer the duration of recovery, the more susceptible the project area is to noxious weed invasion and the resulting consequences to resources. Adaptive management under Alternative 2 provides a range of use rates that can shorten this recovery period if more stringent standards are implemented.

Summary: Livestock would continue to act as a vector of noxious weed introduction and spread under Alternative 2. Livestock presence on the landscape results in a risk of noxious weed introduction into noninfested sites because they can carry weed propagules in their hair, hooves, and digestive tract. Based on current noxious weed populations, the risk of spreading infested sites is low in the Happy, Derr and Little Summit Allotments. This risk is high for the Deep and Roba Allotments, however, adaptive management gives the land manager greater opportunity to tailor utilization rates and the amount of disturbance to specific areas which are not meeting desired conditions. Alternative 2 would allow greater control of livestock impacts if prescribed standards are not met. Herbaceous plant communities respond differently to grazing impacts; the duration of rangeland recovery and increased resilience to noxious weed invasion is better met with more options and better control of livestock. Resting the Roba Allotment for three years would result in improved noxious weed treatment during this time period.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects: This alternative proposes keeping grazing standards at current levels, which are regulated by the Forest Plan and the Annual Operating Instructions. Current trends in vegetative condition would continue where only one of the 12 pastures within the allotments is Properly Functioning, four pastures are Non-functioning and the

rest are Functioning-at-Risk. It is the opinion of the Westside Interdisciplinary Team members that continuing current management would result in Functioning-At-Risk pastures in the Deep, Derr and Little Summit Allotments becoming Non-Functioning in the long-term. The Happy pastures are expected to continue an upward trend in the long-term.

Noxious weed presence and density is tied to an interrelationship between climate, vegetation potential, soil productivity, and disturbance. Rangeland in poor condition is highly susceptible to invasion by noxious weeds (DiTomaso 2004). Although weeds are established and spread by a variety of sources, livestock can be a major vector. This alternative would exacerbate the existing noxious weed condition and maintain rangeland in a less than desirable condition.

Livestock can directly disturb the soil causing bare ground and conditions favorable to invasive plants. Bare ground greatly increases the risk that noxious weed seed transported by the cows themselves or any other means would quickly become established, compared to an area occupied by native vegetation. Effects of livestock include trampling of vegetation, reduction of litter, accelerated erosion on bare soil, and decreasing plant cover, all of which have the potential to increase the risk of weed establishment. Substantial litter reduction can cause a subsequent increase in bare ground (Schulz and Leininger 1990). Soil compaction is another indirect effect concerning weeds. Compaction disturbs the soil crust and increases the bulk density, which in turn increases erosion (Kleiner and Harper 1977).

Mitigation measures to help prevent noxious weeds are the same for both action alternatives. These measures mostly include education materials and maps of weed sites for permittees. One measure of note describes keeping livestock in a small holding area when coming from a pasture infested with noxious weeds to allow seed passage through the digestive tract (and to fall off hair and hooves). When implemented, this would reduce the effect of livestock spreading weeds, especially houndstongue.

Happy Allotment: Current livestock management practices would not have a major effect on the introduction and spread of noxious weeds in the short-term. There are several Canada thistle sites in this allotment that are not controlled and it is possible that livestock may spread seed while walking through the area. The north pasture is a very productive area on the Paulina Ranger District and is classified as Properly Functioning. The other two pastures are considered Functioning-at-Risk but are on an upward trend with only a few sites along Happy Camp and Haypress Creeks that are problem areas (Palmer, 2004). Monitoring plots on dry meadow types show a fairly high composition of forbs including yarrow, strawberry, and phlox, all of which are low and moderate site indicators within dry meadow types, indicating a more static trend. Vigorous, intact native plant communities are able to resist noxious weed invasion. It is possible that current grazing levels may cause plant community function to stay static or decline in the long- term.

Derr Allotment: Currently, there are no known noxious weed sites within the Derr Allotment; therefore, livestock are not a concern for weed spread. Both pastures are rated as Functioning-at-Risk. Dry meadows and stiff sage plant associations are not in acceptable condition for range forage, which means species composition has changed to non-palatable plants and plant density has decreased. This is of particular concern from a noxious weed invasion standpoint. Dry meadows and stiff sage sites occur on residual (clay) shallow soils which are susceptible to invasion by non-native plants such as

medusahead and cheatgrass. Continued drought and maintaining existing livestock management standards puts these areas at risk in both the short and long-term.

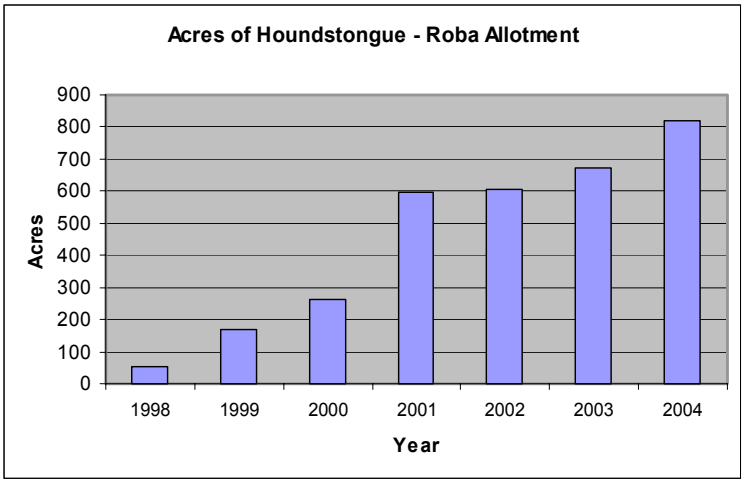
Deep Allotment: Maintaining current grazing practices within the Deep Allotment would result in continued spread and introduction of noxious weeds, with many riparian areas particularly at risk. Monitoring shows approximately 13 miles of stream corridor, especially along Deep, Jackson, and Little Summit Creeks, are not meeting desired future conditions due to streambank stability, inadequate ground cover and early seral vegetation. These areas are particularly vulnerable to houndstongue invasion. There is a substantial infestation of houndstongue in the Roba Allotment that is growing rapidly and livestock from the Deep Allotment graze there first, and then move into the Deep Allotment. Livestock are known to carry houndstongue seed burrs in their hair and hooves. A 1997 study by De Clerck-Floate determined that livestock with burrs on their faces in June and July had lost them by August. By grazing Roba in the spring first, livestock are picking up last year's mature seed burrs and are then transporting them to the Deep Allotment. Since 1995, there has also been a practice of grazing the combined number of cows, 436 cow/calf pairs, in both allotments. This greatly increases the risk of transporting and depositing seeds into the Deep Allotment by having twice as many cows as is permitted (AUM's are not exceeded).

Without herbicide as an efficient method of houndstongue control, along with declining riparian health in part due to grazing pressure, maintaining current grazing practices is expected to increase noxious weed populations.

Little Summit Allotment: Maintaining current management practices may exacerbate the downward trend of soil productivity and vegetation seen on low and stiff sagebrush sites. These sites are comprised of shallow clay soils which are vulnerable to widespread medusahead invasion. There are also nine miles of riparian area not in a desirable condition due to poor ground cover. These areas are susceptible to Canada thistle and houndstongue infestation. There are no pastures within this 16,000+ acre allotment making livestock distribution management more difficult, which can result in concentrated use. This allotment is adjacent to Roba which has a large noxious weed infestation, increasing the risk of weed introduction by proximity. Continued grazing at current intensity is expected to result in increased noxious weed populations in the short-term (<15 years).

Roba Allotment: Livestock are the primary vector for spreading houndstongue within the Roba Allotment. Having nearly twice the permitted numbers of cows graze within the allotment doubles the probability of seed spread. This allotment has seen a sixteen-fold increase in houndstongue population in seven years, which is approximately a 50% increase each year. The first 10 years of a noxious weed invasion are the slowest, after 10 years the population increases exponentially (Sheley pers. comm.). Diagram 3 shows houndstongue acreage since 1998. The West pasture of Roba has been rested for three years to facilitate manual control efforts. This has proved to be effective. Initial treatments concentrated on Burnt Corral Creek in the West pasture, with weed density decreasing and the pasture only had an 11 acre increase in three years.

Diagram 3: Houndstongue Increase in the Roba Allotment



Concentrating livestock in the other pastures has led to a sizeable increase of houndstongue acreage in the Dipping Vat and Roba Pastures. The Dipping Vat Pasture populations have increased by 29 acres and the Roba Pasture by 157 acres in those three years. This may be underestimated because little inventory was conducted in 2004.

The continuation of current grazing practices would not improve livestock-created bare ground within the allotments. The long-term indirect effects of bare ground contribute to noxious weed invasion. Increasing amounts of bare soil and compaction leads to declining perennial plant vigor, reduces infiltration, and is a precursor of an increase in annual forbs (Weixelman et al 1997). Areas habitually used by livestock, such as springs, would remain disturbed and may increase through continued use. The risk of weed introduction on bare ground by any number of vectors increases through time. Personal observations of areas in the Roba Allotment, Hewed Log Spring for example, that were bare ground in 2002, now have a greater than 50% cover of houndstongue.

Alternative 3 is expected to result in a continued increase in noxious weeds and a continued decline in rangeland health. All pastures in this allotment are considered Non-functioning, and the presence of noxious weeds in riparian and upland areas indicates that the rangeland has lost resilience to disturbance, and is a symptom of weakened forage and lost productivity (Pyle 2004). Although there are many cumulative factors for Roba's declining range condition, long-term herbivory can influence ecosystem processes through effects on vegetation composition and productivity, successional rates, and soil-nutrient concentrations (Irwin et al 1994). The current season of use, which extends until October 15, does not allow for re-growth of perennial bunchgrasses which is needed to sustain the plants. The shallow soils that dominate the Roba landscape have less water storage than deeper soils, and grazing pressure that results in high levels of utilization after plant maturity can diminish canopy cover and thus restrict water storage during the winter (Hann et al 1997). According to the current Allotment Management Plan, Roba is supposed to be used as a rest-rotation grazing system, where alternating pastures would be rested each year, which would allow some native plant recovery. Since 1995, the allotment has been managed as a deferred rotation system which staggers the season of use each year. A consequence of the non-functional ecosystem and current grazing practices described

above has resulted in a considerable noxious weed population with no efficient means of treatment. No herbicides can be used and manual treatment is less effective, labor intensive, and is limited by lack of funding.

Cumulative Effects: See the Cumulative Effects section under Alternative 1 for past and future activities that may affect acres of noxious weeds within the allotments. Consequences of noxious weed invasion are well documented on effects to wildlife, soil stability, plant diversity, insects, and butterflies. In addition, the livestock industry is also impacted. In 1999, weeds in rangelands caused an estimated loss of $2 billion annually in the U.S. Weeds lower the quantity and reduce the quality of forage, poison animals, increase the cost of managing and producing livestock, and reduce land value (DiTomaso 1999). Houndstongue in particular is a problem for livestock management. The forage is toxic to livestock and the barbed seeds attach to livestock, causing irritation and potential market losses (De Clerck-Floate 1997).

Summary: Livestock would continue to act as a vector of noxious weed introduction and spread under Alternative 3. Livestock presence on the landscape results in a risk of noxious weed introduction into uninfested sites because they can carry weed propagules in their hair, hooves and digestive tract. Based on current noxious weed populations, the risk of spreading infested sites is low in the Happy, Derr and Little Summit Allotments. This risk is high for the Deep and Roba Allotments. Livestock also contribute to weed invasions by selective foraging on, and reducing or eliminating, native plants. Based on current vegetative conditions, where all but one pasture is considered either Functioning-at-Risk or Non-Functioning, continuing livestock grazing at existing management standards is expected to continue the decline in native plant community function and lack of resilience to disturbance. Roba Allotment is of particular concern where noxious weed levels indicate an ecosystem out of balance. With no effective means of weed control, Roba's weed populations are estimated to increase exponentially within the next three to five years.

Heritage Resources

Affected Environment

The Areas of Potential Effects (hereafter referred to as the Project Area) for Heritage Resources for the Westside Allotments Environmental Analysis are the places where livestock congregate within the boundaries of the following grazing allotments on the Paulina Ranger District: Deep, Derr, Happy, Little Summit, and Roba. Regional Heritage direction for large scale grazing Annual Monitoring Plans (AMP) is to concentrate analysis on those areas where livestock congregate. For this analysis, the District Range Specialist identified those areas within these five allotments.

The geography of the Paulina Ranger District contributed to its use over thousands of years by tribal bands and also historically by Euro-Americans. The southern half of the District borders an interface between the lower grasslands below and, above, the forested foothills of the Ochoco Mountains. This interface was visited and used often by tribal bands for seasonal habitation and both ecological areas were used for resource gathering. Subsequently, today these areas also reflect a high probability for finding the remains of

this use in the archaeological record. Interspersed in the forested foothills are rock flats supporting a varied population of traditional plants, and also springs that afforded water and hunting opportunities. Historically, these lower foothills were an entrance way into the Forest for grazing, hunting, and early-day homesteading and logging.

The existing condition of archaeological sites within the Project Area varies. Euro-American sites (wooden structures, log troughs) are better protected against logging, livestock grazing, and road building due to their location and structural qualities, however, weathering from age and fires affect their integrity. The majority of prehistoric sites within the Project Area have undergone decades of disturbance to their surface and subsurface from livestock grazing, logging, road building, and surface collecting.

The areas within the five grazing allotments where livestock congregate were analyzed for past Heritage survey coverage, and all archaeological sites within these areas were identified and analyzed for their eligibility to the National Register of Historic Places, and for specific damage listed in their site records from livestock grazing. The following data was compiled:

Land within the five grazing allotments: 82,040 acres (NF land only)

Approximate acreage of land where livestock congregate (Project Area) within the allotments: 5,491 acres

Total number of past Heritage inventories within the Project Area: 55

Number of those past Heritage surveys adequate for present SHPO standards: 9

Project Area land with SHPO-adequate past inventories: 4,168 acres

Land within the Project Area still needing Heritage inventories: 1,323 acres

High probability acres needing inventories: 493 acres (100%)

Low probability acres needing inventories: 166 acres (20% of 830)

Total number of archaeological sites within the five allotments: 478

Sites within the livestock congregation areas: 61

Sites within the livestock congregation areas with recorded livestock damage: 30

Euro-American (historic) sites: 3

Prehistoric sites: 27

Of those 30 sites, those that have been evaluated as Eligible to the National Register or are deemed potentially eligible: 28

The types of specific damage mentioned in site records from livestock include the following:

• the trampling and displacement of surface artifacts: when livestock congregate at watering places (streams, springs, developed ponds, watering troughs) they can break fragile obsidian artifacts lying on the surface of the ground. Breakage can render these artifacts unrecognizable and therefore useless to site interpretation and chronology

dependent on typology of the artifact/tool. In addition, the action of these animals congregating can displace surface artifacts from their place of deposition, also making site interpretation difficult to impossible.

• the trampling of subsurface artifacts: where soils are easily eroded, the congregation of livestock can break and/or disturb subsurface artifacts by the compaction and/or churning of the subsurface soils. A large part of archaeology is based on when cultural materials were deposited across the landscape through space and time; the churning of the soil removes an artifact's provenience and removes its place in the chronology of that site.

• the denuding of vegetation on stream terraces by the congregating of livestock, making cultural materials within sites open for surface collecting.

The damage component that is of most concern, and that offers the most opportunity for improvement would be the protection of archaeological sites and their surface and subsurface materials adjacent to streams, springs, developed ponds, and at salt and feed blocks.

The measure used to characterize this damage component would be the assessment of those qualities of an archaeological site that contribute to its eligibility to the National Register of Historic Places, specific to disturbance from livestock and livestock-grazing activities. The objective to be attained is the prevention of disturbance to ground surface cultural artifacts, and to preserve the integrity of the site's subsurface materials (by definition, those cultural materials lying at least 10 centimeters below the surface of the ground) against the damage from livestock.

The National Historic Preservation Act of 1966, as amended through 2000, states in Section 110, 2b:

> that such properties under the jurisdiction or control of the agency as are listed in or may be eligible for the National Register are managed and maintained in a way that considers the preservation of their historic, archaeological, architectural, and cultural values in compliance with section 106 of this Act…

Current day tribal use of this watershed include the harvesting of roots, bulbs, and other vegetation for food, medicinal, and ceremonial purposes, and also hunting and fishing. These uses are protected for the tribes who signed the 1855 Treaty with the Tribes of Middle Oregon. This treaty, signed by Wasco and Sahaptin-speaking Indians living along the mid-Columbia River and its tributaries, ceded title to ten million acres of land to the United States but reserved the right to continue using the land for traditional purposes.

Environmental Consequences

Introduction

The evaluation criteria to be used in analyzing the effects of the alternatives on Heritage Resources is the assessment of the disturbance, from livestock and livestock grazing related activities, to those qualities of an archaeological site that contribute to its eligibility to the National Register of Historic Places. The affected resources to be measured are those archaeological sites known to exist within areas where livestock congregate within the Project Area. The evaluation criteria would be both qualitatively and quantitatively measurable: during the field recording of an archaeological site, its remaining integrity, or

quality, is assessed dependent on the number of damage agents to that site over its lifetime. From that assessment, a percentage is given as to the amount of that site that has not been adversely impacted or destroyed from the combination of damage agents. A pasture by pasture analysis of archaeological sites incurring livestock damage may be found in the Heritage section of the project file for this analysis.

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: With this alternative, those sites presently incurring damage from livestock would no longer be adversely affected by the trailing of livestock to water sources, however, large wildlife ungulates would continue to use these same trails. Livestock, and large ungulates, would no longer be attracted to salting areas where the surface of the ground is substantially affected. The continual introduction of noxious plant species from livestock would be removed, protecting the traditional use plant populations in areas around springs and on rock flats. Existing noxious weed populations would continue to be of a concern to these plant populations. Archaeological sites, in areas along streams where erosion has already taken place due to livestock congregating, would continue to erode unless rehabilitative measures were taken. Terraces along streams, where archaeological sites are often found and where livestock prefer to congregate, would revegetate over a number of years, helping to conceal surface artifacts. This Alternative conforms to those federal laws and guidelines for the protection of NRHP-eligible sites. This alternative would have no impact on the treaty rights of Warm Springs tribal members.

Cumulative Effects: The No Action Alternative would not contribute additional cumulative effects from grazing, however, surface and subsurface cultural materials on the Paulina Ranger District, both historic and prehistoric, have felt the effects of both natural and man-caused activities for thousands of years, sometimes since the day the materials were deposited into the archaeological record. Wildfires, flooding, erosion, and weathering are just some of the natural damage agents that deteriorate archaeological sites. The cumulative effects of logging, road building, grazing, surface collecting and/or illegal digging, and natural fuels reductions accelerate the effects from natural causes. All of these activities would still be reflected in the integrity of these sites. Early site records, dating to the 1970s, often document the disturbance of surface archaeological sites from logging activities, both past and present. Beginning in the mid-1980s, surface sites were given more protection in order to obtain a clearance for that project with SHPO, however, these site still reflect this damage today. With this alternative, archaeological sites would continue to be damaged from natural causes, and also from man-caused agents unless protective measures were implemented.

Alternative 2 – Proposed Action

Direct and Indirect Effects: With this alternative, grazing in all five allotments would continue using an adaptive management approach. With this adaptive management strategy, monitoring would aid in the identification and assessment of livestock damage to archaeological sites. Specific damage from livestock would be documented and mitigation measures would be implemented to protect those qualities of a site that make it eligible to the National Register. The resting of the Roba Allotment would give further protection to

archaeological sites in this area. The design criteria proposed with this alternative would reduce the damage currently affecting sites from livestock grazing. Existing noxious weed populations would continue to be of a concern to traditional plant populations. With adaptive management, archaeological sites would be protected from further erosion along streams where erosion has already taken place due to livestock congregating. With this alternative's adaptive management, terraces along streams, where archaeological sites are often found and where livestock prefer to congregate, would revegetate faster, helping to conceal surface artifacts. With the design criteria included for Alternative 2, this Alternative conforms to those federal laws and guidelines for the protection of NRHP-eligible sites. This Alternative would have no impact on the treaty rights of Warm Springs tribal members.

Cumulative Effects: The mitigation measures with this alternative would prevent damage that is currently affecting archaeological sites within these allotments, however, the cumulative effects of natural elements, logging, road building, grazing, surface collecting and/or illegal digging, and natural fuels reductions would still be reflected in these sites.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects: With this alternative, current management of the grazing allotments would continue. The same direct and indirect effects for Alternative 2 would also apply to this alternative for Heritage Resources with one exception: the Roba Allotment would not be rested and no added protection would be given to those sites in this area. With the design criteria included for Alternative 3, however, this alternative conforms to those federal laws and guidelines for the protection of NRHP-eligible sites. This alternative would have no impact on the treaty rights of Warm Springs tribal members.

Cumulative Effects: The same cumulative effects for Alternative 2 would apply for this Alternative.

Summary: No livestock grazing (Alternative 1) would offer the most protection to archaeological sites. Alternative 2, with its adaptive management strategy, would ensure that, even though grazing was still occurring, sites would be monitored for possible damage and measures would be taken to protect them. Alternative 3, with continuing our current grazing program, would offer the least protection to archaeological sites. The normal visiting and updating of sites with adjacent future projects would be the only way to ensure that monitoring of livestock congregation areas is taking place. Alternatives 2 and 3 both include proposed design criteria that would offer protection to those qualities of a site that make it eligible to the National Register of Historic Places. None of the three alternatives would impact the treaty rights of Warm Springs tribal members.

Proposed, Endangered, Threatened, Sensitive (PETS Plant, Animal, and Fish Species)

Introduction

US Forest Service Manual Direction requires the review of all federal activities on species listed under the Endangered Species Act of 1973 (ESA) as Threatened, Endangered and Proposed species, as well as those species identified as Sensitive on the Regional Forester's Sensitive Species List through a Biological Evaluation (BE) analysis (FSM 2672.4). Additionally, for species listed under the ESA, consultation with the U.S. Fish and Wildlife Service is required if any listed species are adversely affected by a Federal action. This section discloses the effects of the alternatives developed for this proposal on threatened, endangered, and sensitive species in the Westside Allotments Environmental Analysis Project Area. Table 16, Appendix D summarizes the effect/impact on the species assessed in the Biological Evaluations. The Biological Evaluations for PETS species is included in the analysis file.

There are no endangered species known or suspected to occur on the Ochoco National Forest. Threatened species that are known or suspected to occur on the Ochoco National Forest include bull trout, mid-Columbia River steelhead, and northern bald eagle. The Ochoco National Forest in conjunction with the Deschutes National Forest and the Prineville District of the Bureau of Land Management programmatically consulted with the U.S. Fish and Wildlife Service on June 5, 2003 and with the N.O.A.A. National Marine Fisheries Service on March 15, 2005 through the Joint Aquatic and Terrestrial Programmatic Biological Assessment. The Forest received letters of concurrence on July 8, 2003 (1-7-03-I-0475) from the U.S. Fish and Wildlife Service and on June 7, 2005 from the N.O.A.A. National Marine Fisheries Service that projects completed under the umbrella of Project Design Criteria (PDC) would "not likely adversely affect" the above named listed species. Biological Evaluations (BE's) have been prepared to document compliance with the PDC contained in the Programmatic Biological Assessment and the possible effects of proposed activities on threatened and endangered species in the project area. These BE's contained in the analysis file for this project.

Plants

Affected Environment

Introduction: There are no known occurrences of Federally listed endangered or threatened plants within the analysis area. The Ochoco National Forest has no habitat recognized as essential for listed or proposed plant species recovery under the Endangered Species Act.

Sensitive plants receive management emphasis to ensure viability and to preclude trends toward endangerment that would result in the need for federal listing (Forest Service Manual 2672.1). Extensive surveys have been done for vascular sensitive plants within the Westside Allotments project area. Limited surveys have been conducted for nonvascular plants. There are 12 plant species on the Regional Forester's Sensitive Species List (July 2004) that occur or have suitable habitat within the project area; see Table 13 for a list of species. The other 16 species on the Regional Forester's list will not be analyzed due to the

lack of habitat (see the Botany Biological Evaluation in the analysis file). Sensitive plant population data used in the analysis was obtained from the Oregon Natural Heritage Program database and District records. Guidance for managing populations comes from species viability assessments (see the Botany Biological Evaluation, Westside EA project file, Paulina Ranger District), the Ochoco NF Draft Species Management Guide for *Calochortus longebarbatus* var. *peckii* (Kagan 1996), and literature. Other species Conservation Assessments, such as *Botrychium* Species on the Mount Hood NF, are also used for management guidance.

Suitable plant habitat for suspected and documented sensitive species is extensive within the Westside Allotments Environmental Analysis Project Area. The analysis area comprises 83,027 acres in four watersheds and has a wide variety of plant habitat throughout. Elevations range from 4,300 feet to 6,000 feet, and corresponding precipitation from 17" to 25" annually. Most of the landscape within the project boundary can be classified as scab-stringer. Scablands are areas of shallow residual soils which do not support coniferous vegetation. These scablands are dissected by streams that form narrow stringers of forest land, many of which follow fault lines. In contrast, the north pasture of the Happy Allotment is mostly high elevation, north slope mixed conifer dominated by moist grand fir plant associations. Human use has affected the project area. Modifications such as soil compaction and construction of roads are effectively permanent. Other effects such as erosion, dropping water tables, fire suppression, and recreational use are likely to continue which may limit opportunities for achieving desired conditions.

Table 13: Regional Forester's Sensitive Plant Species with Suitable Habitat within the Westside Allotments

Species	Common Name	Habitat
*Achnatherum hendersonii**	Henderson's ricegrass	Low sage scabland
*Astragalus tegetarioides**	Deschutes milkvetch	Ponderosa pine/juniper woodland
*Botrychium ascendens**	Upswept moonwort	Open meadows/springs
Botrychium crenulatum	Crenulate moonwort	Open & shaded meadows/springs
Botrychium minganense	Mingan moonwort	Open & shaded meadows/springs
*Botrychium montanum**	Mountain moonwort	Open & shaded meadows/springs
*Botrychium paradoxum**	Twinspike grapefern	Open meadows and springs
Botrychium pinnatum	Northwestern moonwort	Open & shaded meadows/springs
*Calochortus longebarbatus var. peckii**	Peck's mariposa lily	Seasonally wet, open riparian areas and meadow edges
Carex hystericina	Porcupine sedge	Wet edges of streams and springs
Dermatocarpon luridum	Silverskin lichen	Submerged in perennial streams
Scouleria marginata	Margined black knotmoss	Submerged in perennial streams

* U.S. Fish and Wildlife Species of Concern

The desired future condition for sensitive species analyzed in this report is to ultimately remove them from the U.S. Fish and Wildlife Service's Species of Concern list, and from the Regional Forester's Sensitive Species list. Ensuring that the species are well distributed with viable, increasing populations within the Ochoco National Forest can contribute to this effort. The majority of rare plant populations in the project area occur in riparian areas. Many of these riparian zones are in a degraded state due to several factors, one of which is

concentrated livestock use. One of the goals of the Westside Allotment Project is to improve riparian function through changes in grazing standards.

Habitats for sensitive species are variable within the allotments. High quality habitat for Yellow Lady's-slipper, silverskin lichen, and knotmass occurs in the North Pasture of the Happy Allotment. Henderson's ricegrass occupies very dry sites with shallow, stony soils that support little livestock forage. This type of habitat is present throughout the allotments; however, the most suitable habitat lies within the Roba Allotment. Moonworts, the sedges, and Peck's mariposa lily are riparian species with habitat present throughout all allotments. Of the plants that have habitat within the Westside Allotments, there are seven documented species present. Table 14 below lists the number of populations and the total acreage summarized by allotment.

Table 14: Documented Sensitive Plant Populations by Allotment

Allotment Species	**Happy** Populations Acres	**Derr** Populations Acres	**Deep** Populations Acres	**Little Summit** Populations Acres	**Roba** Populations Acres	Total
Achnatherum hendersonii					1 2.7 acres	1 2.7 acres
Botrychium ascendens	1 0.1 acres					1 0.1 acres
Botrychium crenulatum	5 3.9 acres	1 7.7 acres	8 3.6 acres	13 12.2 acres		27 27.4 acres
Botrychium minganense	2 0.4 acres	4 4.7 acres				6 5.1 acres
Botrychium montanum	5 1.6 acres			1 0.2 acres		6 1.8 acres
Botrychium pinnatum	2 0.4 acres					2 0.4 acres
Calochortus longebarbatus var. peckii	19 92.2 acres	34 76.2 acres	64 309.5 acres	66 850.6 acres	23 52.8 acres	206 1,381.3 acres

The Westside Allotments contain 23% of the global population of Peck's mariposa lily, with extensive, contiguous populations occurring in the Little Summit Allotment. Since the habitat requirements of moonworts are similar for all species, species often occur together in genus clusters. They will be considered as one group for this analysis. Crenulate moonwort occurrence within the project area is 1.7% of the total Oregon population. All other species listed above are less than 0.1% of the total Oregon population.

Environmental Consequences

Introduction: Modern-day use of the Westside Allotments Project Area dates back more than a century, including domestic livestock grazing, timber harvest, fire suppression, road building and big game browsing. Over time this has led to degraded riparian conditions (USDA 2001, USDA 1999), which in turn has led to sensitive plant habitat degradation and

population isolation. The key to genetically diverse and demographically healthy plant populations is the maintenance of habitat distribution and connectivity (Marcot and Murphy 1992). Riparian vegetation and condition is directly tied to stream condition. Many upland areas are considered Functioning-at-Risk or Non-Functioning.

The effects to sensitive plant habitat, and resulting species viability, is based on 1) Bottom line stream surveys, which measured stream bank stability and width/depth ratios; 2) Ochoco National Forest ecology plots (Riegel 2004), which measured soil condition parameters and plant species composition; 3) Range monitoring sites, which measured soil stability, ground cover and species composition; and 4) Informal rare plant monitoring of populations and habitat.

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: This alternative would result in a biological evaluation determination of "No Impact." The elimination of grazing within the allotments would provide security of sensitive plant populations and habitat for the long-term viability of these rare species. Direct impacts of plant consumption and trampling associated with livestock use would no longer occur. Sensitive plants would recover from years of chronic herbivory, which would result in increased population density and vigor and the opportunity to propagate. Riparian habitat for species including Peck's mariposa lily, porcupine sedge and moonworts would benefit the most from the No Action Alternative. Habitat for Deschutes milkvetch and Henderson's ricegrass are less vulnerable to grazing effects due to habitat location and growth form, but would also benefit from long-term (15+ years) recovery of indirect effects.

Indirect effects attributed to livestock include grazing associated changes in species composition, noxious weed establishment, and decreased soil moisture due to soil compaction and lack of plant litter. All but one of the pastures in the project area is not Properly Functioning due to early seral species, unstable streambanks and/or soil erosion. Many of these areas are also in a declining trend; eliminating grazing would help reverse this trend. Clary and Webster (1989) summarize that in general, vegetation recovery after grazing elimination occurs within 5 to 15 years for plant communities in good condition. Some of the project area, including the Happy Allotment, and the uplands of Derr Allotment are close to meeting desired conditions. Eliminating grazing in these areas is expected to improve sensitive plant habitat within 15 years. Areas that are Non-functioning would recover from grazing at a slower rate, beyond 15 years. The Roba Allotment, especially riparian habitat, is considered Non-Functioning and has a growing noxious weed population, an indicator that native plant communities have lost resilience to disturbance. Areas within this allotment are expected to take many decades to recover Hann et al. (1997) states that successional advancement might not be realized under a no-grazing scenario when areas have an abundance of non-native plants.

In the very long-term (30 years), when plant communities have met desirable conditions of species composition, vigor and cover, and stream channel physical attributes are functioning normally, lack of grazing may affect sensitive plant habitat. Many of these rare plants are early to mid seral species which require disturbance and open sunlight to thrive. Light intensity grazing can keep habitat more open.

The No Action Alternative would provide the greatest protection for sensitive plants and habitat compared to livestock grazing proposed in the other alternatives. Direct impacts to plants would not occur, and native plant communities are expected to become more vigorous and would recover faster than with livestock grazing. This, along with beneficial activities described in the cumulative effects section would help maintain long-term viability of sensitive species.

Alternative 2 – Proposed Action

Direct and Indirect Effects: Alternative 2 would result in a biological evaluation determination of "May impact individuals or habitat but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species" for all sensitive species with habitat in the Westside Allotments. Livestock grazing has a two-fold effect on rare plants: 1) Direct physical impacts from plant consumption and trampling, and 2) Indirect ecological impacts through changes in habitat microclimate and selective grazing that changes species composition. Physical impacts result in loss of plant vigor, a decline in reproduction, and occasionally up-rooting (Stoddart, et al 1975). Indirect impacts from grazing pressure changes plant species composition by favoring less palatable species, reducing the cover of native plants, and allowing invasion by non-native plants. Changes to soil surface characteristics also occurs (Hann et al 1997), including soil compaction and related reduction in water infiltration, reduced soil litter, and disruption of cryptogrammic soil crust (Stoddart, et al 1975).

Mitigation measures are a part of alternative design. The measures proposed (see Chapter Two), such as keeping salt blocks ¼ mile away from sensitive plant locations, would somewhat reduce direct effects to populations and habitat.

Upland Species: Plant phenology is important when discussing timing of grazing effects. Direct effects to yellow lady's-slipper and Deschutes milkvetch are expected to be minor. Yellow lady's-slipper produces flowers in May and early June, before livestock are turned out on the allotments. The highest probability habitat occurs in the Happy Allotment where cows do not graze until after July 15, and it is also the pasture in the overall best vegetative condition within the project area. Deschutes milkvetch is a prostrate plant and herbivory would be incidental. Both of these species occur in forested communities that are generally in good condition and habitat health is not thought to be declining. Livestock do not tend to congregate in these habitats for any length of time. Since condition determination is done at pasture levels, which are currently considered Functioning-at-Risk or Non-Functioning, upland forage utilization rates would be more stringent than Alternative 3, which is expected to result in less effect due to less duration of grazing.

Henderson's ricegrass is a small bunchgrass that occurs on shallow scablands with little vegetation; the greatest potential for impacts comes from soil disturbance. If conditions are moist, livestock walking through these clay soils can cause changes in microclimate surrounding individual ricegrass plants, interrupt moisture flow, and reduce infiltration through compaction. This is especially true for the Roba Allotment which has documented ricegrass populations and high probability habitat. Livestock graze into October when precipitation is generally high, which increases the likelihood of soil impacts. Again, under this alternative, utilization and disturbance standards are expected to result in less grazing pressure. All upland rare species would also benefit in the short-term from resting the

Roba Allotment for three years. Direct impacts would not occur and indirect effects would subside during this timeframe.

Riparian Species: Livestock grazing under Alternative 2 would impact Peck's mariposa lily, porcupine sedge and moonworts. The Westside Allotments Project Area contains 23% of the global population of Peck's mariposa lily. Direct impacts to the plants are from trampling and consumption of the basal leaf. Grazing of the basal leaf each year can reduce the life of an individual by limiting the amount of photosynthate available for bulb renewal (Fiedler 1987). Intensive lengthy and repetitive grazing can also change the microclimate of streams and meadows in the long-term due to streambank disturbance, soil compaction, and vegetation changes. Peck's mariposa lily appears to require a particular moisture regime. The requirements of this condition are not well known due to lack of study, however, observations show that altering the hydrology of stream channels is one of the largest threats to the species (Fredricks 1989). Peck's lily habitat occupies 55% of the riparian area within the allotments. Many of these areas are not meeting desired future conditions due to poor streambank stability, lack of ground cover, and early seral vegetation comprised mainly of forbs and Kentucky bluegrass.

Peck's mariposa lily does appear to tolerate some grazing pressure, and there is some indication that grazing can facilitate habitat in a mid-seral successional stage that benefits this plant. Physical attributes of riparian areas, however, need to be in good condition for this effect to be beneficial. Adaptive management proposed in Alternative 2 sets utilization and disturbance standards based on range condition. Due to the current condition of rangeland within the allotments, all pastures are expected to have less impacts and move towards desired conditions more quickly than Alternative 3.

Grazing also affects moonwort, porcupine sedge, riparian moss and lichen habitat through changes in microclimate and trampling; vegetative loss due to herbivory appears to be incidental. Although some moonwort populations adjacent to roads, such as the crenulate moonwort site along the 4270 road, can receive heavy grazing pressure and consumption. Repeated removal of the sporangia before dispersal could reduce reproductive potential over time (Beatty et al 2003). Habitat modification from grazing is more likely to affect moonwort populations. These species occupy rare, ecologically diverse habitats, and rely on mycorrhizal fungi for water and nutrients. This mycorrhizal relationship is very sensitive to changes in soil moisture, changes in temperature and humidity, or light regime (Potash 1998). The length of time livestock spend in these habitats increases the potential for detrimental effects. Alternative 2 would impart more stringent utilization and disturbance standards in all but one pasture in the project area (because they are rated as Non-functioning), which is expected to result in less time spent in riparian habitat. Duration of this grazing season would be less under Alternative 2 along the North Fork Crooked River, (which is habitat for all riparian sensitive species) as the pasture would be rested for three years and then every other year after that.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects: Alternative 3 would result in a biological evaluation determination of "will impact individuals or habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species" for Peck's mariposa lily. This triggers a significant action as defined in NEPA (USDA 1995). The determination is based on continuing grazing at currently implemented

standards, and cumulative effects that would result in an increased risk of loss of viability to a significant population, in this instance the metapopulation within the Deep Creek Watershed. A determination of "may impact individuals or habitat but will not likely contribute to a trend towards federal listing or loss of viability to the population or species" is found for all other species with habitat in the project area.

Mitigation measures are a part of alternative design, the measures proposed (see Chapter Two), such as keeping salt and feed blocks ¼ mile away from sensitive plant locations would somewhat reduce direct effects to populations and habitat.

Upland Species: Maintaining livestock grazing at current management levels would result in degraded habitat for upland rare species in the Deep, Derr, Roba and Little Summit Allotments. It is the opinion of the Westside Interdisciplinary Team that Functioning-At-Risk pastures will likely become rated as Non-Functioning in the long-term (15+ years). The Happy Allotment is expected to continue on a slow upward trend under current management standards.

In the short-term (<15 years), grazing effects to Henderson's ricegrass and yellow lady's-slipper habitat would be minor in the Happy, Derr and Little Summit Allotments. Detrimental effects to habitat of these species are more likely to occur in the Deep and Roba Allotments. These permits are run together which means twice the number of permitted cows are grazing each of these allotments. Plant phenology-based direct effects from herbivory would be similar to Alternative 2, however, more animals within an area results in a higher potential for direct effects from trampling. Indirect effects of soil disturbance and compaction are also expected to increase, as more animals results in higher intensity use of an area. Roba has the longest grazing season, June 16-Oct 30, of the allotments and it is the driest with 17 inches of annual precipitation, and is the least productive. Grazing plants after maturity does not allow regrowth and recovery, resulting in diminished conopy cover and water storage during the winter, which will not sustain plant growth over long durations (Hann et al. 1997, Parsons et al. 2003). In the long-term (15+ years) if grazing management is maintained at current trends, palatable forage species would continue to be over-utilized, with two-fold results: 1) species composition would slowly change to early seral plant communities dominated by annuals and weedy plants; 2) livestock would have to range further to find forage, which is expected to cause more utilization and trailing through rare upland species habitats.

Riparian Species: Continuing livestock grazing at current levels is expected to jeopordize the long-term viability of Peck's mariposa lily. This is based on current and projected trends in riparian area function, which is related to the survival of this rare plant. The plant is a sterile triploid incapable of sexual reproduction. Reproduction is vegetative; a small bulblet forms below ground and breaks away from the parent plant to produce a new individual. Viability depends on health of parent plants and maintaining functioning habitat. The Westside Allotments contains 23% of the global population of the lily, a local endemic to Central Oregon. At present, 41.25 miles of streams surveyed within the project area are considered in either Functioning-At-Risk or Non-Functioning condition due to an excess of early seral vegetation, inadequate ground cover, poor soil and streambank stability and declining wetted area next to the stream channel. This condition is expected to decline further if current grazing levels are maintained. Riparian areas considered

Functioning-At-Risk are expected to become Non-functioning through time, indirectly affecting Peck's mariposa lily populations through loss of habitat function.

Within the 41.25 miles of riparian area in poor condition there are 439 acres of Peck's mariposa lily populations, 32% of the total Westside populations. Personal observations of additional stream area not formally surveyed revealed another 44.25 acres of populations that are over-utilized by livestock, including several tributaries of Little Summit Creek that are routinely used as bedding areas, resulting in loss of plant cover and large amounts of bare ground. This brings the total affect to 35% of the populations within the project area.

Degraded stream conditions have fragmented the Peck's lily populations within the project area. Wetted area within riparian zones has decreased from incised stream channels, decreasing the amount of Peck's lily habitat and therefore increasing the potential for direct effects from grazing. Based on current habitat condition, an expectation of further declining trend, and cumulative effects discussed below, Peck's mariposa lily viability cannot be ensured under this alternative.

Continuing current management standards is also expected to detrimentally effect populations of moonworts. These small fern-like plants occur in meadows and springs/boggy areas adjacent to streams. Over-utilization of these areas by livestock can change species composition from deep-rooted perennial plants such as sedges and rushes to shallow-rooted plants including Kentucky bluegrass and annual forbs. This decreases the water holding capacity of the area, shrinking the size of meadows, thus making both direct and indirect effects more probable. For moonwort populations to expand, habitat must be in good condition with mycorrhizal relationships, described under Alternative 2, intact and present at the receiving end of spore dispersal (Beatty et al. 2003). Continued degredation of riparian habitat under Alternative 3 is expected to cause a decline in moonwort habitat.

Detrimental effects to Porcupine sedge, knotmoss and silverskin lichen habitat is expected under this alternative. This is based on the same rationale as the effects to Peck's mariposa lily habitat. As riparian area function decreases, the amount of habitat decreases and the less likely it is to support rare species.

Cumulative Effects For All Alternatives: Past management in the cumulative effects analysis area (Westside Allotments Project Area), including timber harvest, a century of historic livestock use, big game grazing, fire suppression, wildfires, and road construction, have resulted in a variety of vegetation conditions. Many stream channels have widened and incised, thus losing the amount of floodplain area and the associated vegetation that depends on wet conditions. Stream banks become raw with the loss of soil holding root masses provided by willows, sedges and rushes. As stream channel morphology changes and degrades, loss of sensitive plant habitat is imminent.

Recent activities within the project area that have incrementally added to the condition described above include: Deep Salvage, Dippy Beaver, Summit, Rainier, Fryton, Fry and Barn Timber Sales. Major activities under these actions are listed in Table 15. There are both beneficial and detrimental effects by these actions. Beneficial effects include pre-commercial thinning within riparian areas and Peck's lily populations, and prescribed burning. Both of these activities reduce conifer encroachment, which increases sunlight to the forest floor and reduces competition. Detrimental effects include soil compaction and the creation of bare ground. Timber harvest generally does not have direct effects to sensitive plant populations because populations are avoided. Detrimental indirect effects

from changes in microclimate and soil compaction, however, do affect rare plants, particularly moonworts. Roads that cross or run parallel to streams have effects on streams and vegetation. Roads alter stream drainage patterns by confining the stream, reducing the area within the floodplain, so floodplain interaction is disturbed. This in turn affects riparian habitat and its function. It is speculated that Peck's mariposa lily is spread by bulblets moving downstream during high water flow. Roads that cross drainages can affect bulblet dispersal. Roads and clear-cuts also provide livestock easier access to streams occupied by sensitive plants.

Table 15: Recent Activities in the Westside Allotments

Activity	Summit (1996)	Deep Salvage (1995)	Dippy Beaver (1996)	Fryton/Rainier/Barn (1992-present)
Timber Harvest	2,040 acres	900 acres	1,200 acres	1,739 acres
Natural Fuels Burning	8,000 acres	0 acres	3,500 acres	2,704 acres
Precommercial Thinning	350 acres	0 acres	800 acres	1,120 acres
Road Construction (including temporary)	6 miles	3 miles	3.7 miles	15.8 miles

Cumulative effects of fire suppression and the loss of water table has resulted in conifer development within riparian areas. This is especially true in areas where cold air pools encourage lodgepole pine establishment along Jackson, Derr and Happy Camp Creeks. Encroachment of conifers appears to limit Peck's lily habitat on many of the streams in the planning area. The plant does not do well under heavy shade. Competition from rhizomatous grasses, particularly introduced grasses such as intermediate wheat grass (*Agropyron intermedium*) and smooth brome (*Bromus inermis*), is increased with suppression of wildfire. Many *Calochortus* species are poor competitors, and this may be a cause of reduced vigor in some populations.

Foreseeable future actions that may affect sensitive plants and habitat include: 1) The Deep Vegetation Management Project will harvest 6,300 acres of timber, prescribe burn 8,500 acres, carry out 25 miles of road reconstruction and construction, and place large woody debris using heavy equipment on 7 miles of stream. 2) The Deep Restoration Project concentrates on physical improvements within stream channels including culvert replacements, large wood placement, cutbank revetment, pool habitat restoration, and stream channel reconstruction. These projects would occur in all but Roba and the north pasture of Happy Allotments. In the long-term, riparian vegetation in general would be improved due to conifer removal in riparian areas (limited), road closures, culvert replacement, and shrub plantings. At the same time, the Deep Restoration project would result in over 25 acres of Peck's mariposa lily populations (1.8% of the metapopulation) would be directly impacted and plants destroyed.

Sensitive plant habitat and populations are particularly vulnerable in the Roba Allotment. The noxious weed houndstongue, *Cynoglossum officinale*, has invaded most of the Peck's mariposa lily habitat, and is spreading to forested communities, which include Deschutes milkvetch habitat. This is an indication that the area has lost resilience to ecological disturbance. There are 9.6 acres of Peck's lily that have between 20-90% cover of houndstongue; on Roba Creek near the District boundary there is approximately one acre of 90% cover. These populations are identified in the Draft Management Plan for Peck's lily as populations critical for protection to ensure long-term species viability (Kagan 1996). Livestock graze and travel through all of these areas, which exacerbate the spread of the weeds.

There is a complex interrelationship between climate, vegetation potential, soil productivity, disturbance, and noxious weeds. Disturbance in this case is considered livestock grazing. There is much debate on the nature, extent, and direction of change in the environment but it is clear that one of the influences is livestock grazing pressure (Hemstrom et al 2001). Grazing pressure changes plant species composition by favoring less palatable species, reducing the cover of native plant species, allowing invasion by non-native plants and changing soil surface characteristics (Hann et al 1997). The Roba, West, and Dipping Vat Pastures are considered Non-functioning due to soil erosion, early seral species, and streambank stability. Noxious weed presence in riparian areas and uplands support the conclusion of Non-functioning ecosystem. Noxious weeds in these areas are an indication that rangelands have lost the capability for ecological resilience; they are a symptom of weakened forage and reduced productivity (Pyle 2004).

Summary: No livestock grazing (Alternative 1) is expected to enhance rare plant species viability, and move the allotments toward the desired future condition faster than the other alternatives. This includes desired conditions of upland and riparian conditions, and moving toward removing species from the Sensitive Species List. This does not, however, meet the purpose of the project. Livestock grazing under Alternative 2 would affect rare species and habitat, while slowly moving toward desired conditions, and therefore ensuring rare species viability. Continuing grazing as currently implemented (Alternative 3) would affect rare species, potentially jeopardize Peck's mariposa lily viability, and is not expected to move towards desired conditions.

Terrestrial and Amphibian Species

Introduction

Table 2 in Chapter One identifies terrestrial and amphibian species listed under the Endangered Species Act of 1973 and the Regional Foresters Sensitive Species List that are known or likely to occur within the Westside Allotment Analysis Area. Table 16, Appendix D summarizes the determinations for effect/impact on the species assessed in the BE.

ESA Listed Species

Northern Bald Eagle

Affected Environment

The northern bald eagle uses habitat on the Paulina Ranger District for both nesting and as winter roost habitat. Known nest sites and winter roost areas are located on the southern portion of the district along Wolf Creek and near the Sugar Creek campground, as well as an active nest site to the north near Rock Creek Reservoir. The Wolf Creek winter roost and nest are approximately 12 miles from the project area. The Sugar Creek winter roost is approximately 13 miles from the project area. The Rock Creek nest is approximately three miles from the project area, and is adjacent to the north east corner of the Derr Allotment. The Wolf and Sugar Creek sites are likely outside a normal territory area, however, the Rock Creek nest may be close enough to utilize portions of the project area. Popp and Isaacs observed that bald eagle habitat use associated with the Rock Creek nest site was concentrated in the Rock Creek drainage and mostly on private land immediately north of the nest site. These observations are detailed in maps provided in their draft site-specific management plan (1994). Habitat within the project area could provide for nesting pairs, as suitable nesting habitat is available in the form of large ponderosa pine tree structure. Foraging habitat, however, may be limited as larger stream systems with adequate fish populations are not readily available. No winter roosting activity is recorded in the project area. Site visits in 2003 and 2004 did not detect bald eagles.

Environmental Consequences

Alternative 1

Direct and Indirect Effects: The No Action Alternative (Alternative 1) would not affect the quality or condition of nesting habitat in the project area. Stand structure, canopy densities or overall abundance of large nesting trees would not change with the implementation of this project. No ground disturbing activities would occur with this alternative, and thus would not result in any risk of disturbance to nesting pairs. There would be no direct or indirect effects to bald eagles.

Cumulative Effects: There would be no cumulative effects to bald eagles or bald eagle habitat associated with the No Action Alternative. No activities are proposed with this alternative. As a result no changes to habitat that would be cumulative to other past actions would occur.

Alternatives 2 and 3

***Direct and Indirect Effects*:** The two action alternatives would not result in direct or indirect effects, primarily due to the lack of presence of individuals and nesting pairs in the project. There would be no direct or indirect effects to potential roosting or nesting habitat in the project area as well. Based upon previous survey efforts, no known nesting, active or otherwise, or known winter roost activity occurs in the project area. Because of low habitat suitability, primarily due to the lack of suitable foraging habitat nearby, it is not suspected that nesting bald eagles would occupy habitat in the project area. The vegetation condition that provides this suitable habitat would not be affected by the activities proposed. The

lack of presence of nesting eagles would alleviate any risk of disturbance-associated effects to the species.

Cumulative Effects: The two action alternatives would not result in cumulative effects to bald eagles due to the lack of effects to suitable habitat and the lack of presence of individuals or breeding pairs in the project area.

Canada Lynx

Initial mapping of habitat for Canada lynx on the Ochoco National Forest, based upon the first version of the Lynx Conservation Assessment and Strategy (LCAS), identified potential lynx habitat on the Paulina Ranger District, and in the project area. Subsequent review of the LCAS direction regarding habitat modified how potential habitat was assessed in its ability to provide lynx habitat. As a result, Canada lynx habitat was remapped in 2001 for the Ochoco National Forest. As a result, due to insufficient quantities of primary habitat, Key Linkage Areas (KLA) and Lynx Analysis Units (LAU) are not currently mapped on Ochoco National Forest. In addition, The Deschutes and Ochoco National Forests requested informal consultation (March 30, 2001) on continued implementation of their respective Land and Resource Management Plans (LRMPs) with LAUs mapped in accordance with the 2000 LCAS. The U. S. Fish and Wildlife Service (USFWS) gave concurrence that the mapping was consistent with the current mapping direction, and that implementing forest plans using the current mapping would result in "may affect, but not likely to adversely affect" (NLAA) conflict determinations (May 24, 2001 and June 22, 2001). The Canada lynx was also removed from the Regional Forester's sensitive species list for the Ochoco National Forest in the July 2004 release. Because of these actions, effects to the Canada lynx will not be discussed in this document.

Regional Forester's Sensitive Species

Sensitive Species Analyzed Further

Some sensitive species included on the Regional Forester's Sensitive Species list for the Ochoco National Forest will not be analyzed further in the document because there are no records which reflect the species' presence and because there is no suitable habitat within the analysis area. These species include the pygmy rabbit, peregrine falcon, bufflehead, upland sandpiper, and tri-colored blackbird. A description of the habitats necessary for these species and documentation of the lack of species occurrence is contained in the Westside Allotments Project Biological Evaluation (analysis file).

Species that have not been documented within the analysis area, but have habitats present are described as having suspected occurrence. Effects to this habitat are analyzed within this section. Also, effects to those species with documented occurrence and habitat are also analyzed below.

California Wolverine

Affected Environment

California wolverine habitat is best described more in the terms of its ability to provide seclusion and freedom from disturbance while also meeting foraging habitat and prey base (Ruggiero et al., 1994). Wilderness areas, large tracks of roadless areas, high elevation alpine areas and other similar habitats most often provide the highest quality habitat and is where wolverines are most often found. Foraging sources vary and include everything from small rodents to large ungulates, both in the form of active kills and the scavenging of carcasses (ibid.). Wolverines often exhibit large territories that they will actively travel in search of food/prey and in search of mating opportunities. These territories and home ranges may vary seasonally following foraging sources.

Habitat within the project area would not be considered high quality. Road densities in the project area are generally above Forest Plan standards for density management, increasing the likelihood of disturbance effects from general vehicle traffic and forest use. Vegetative habitat conditions are not those identified as primary habitat types (ibid.). The broken fragmented nature of the project area, due in large part to the natural distribution of forest and scab/shrub-steppe habitats, as well as past timber management, produces a lower quality habitat. Wolverine occurrence in the analysis area would be infrequent at best and would be individuals dispersing to higher quality habitats such as Wilderness Areas or other roadless areas. Ruggiero et al. describe various forest types, primarily associated with boreal and conifer forest, along with other types not common in northeast Oregon (1994). Existing forested habitat, however, would provide cover and support some forage sources, primarily big game animals that may provide carrion forage sources.

Environmental Consequences

Alternative 1

***Direct and Indirect Effects*:** Alternative 1 would not adversely affect the quality and condition of habitat in and around the project area. There would be no changes to habitat conditions within the project area with implementation of this alternative. No changes to road densities would occur.

Cumulative Effects: Alternative 1 would not result in cumulative effects, additive to other actions that have affected California wolverine habitat, to the California wolverine. No activities would occur with this alternative.

Alternatives 2 and 3

Direct and Indirect Effects: The action alternatives and activities associated with them would not result in direct or indirect effects to the California wolverine. Activities would not alter or otherwise change the existing function and condition of vegetative/forest habitat in the project area such that wolverine would be affected.

There is potential for disturbance related effects associated with implementation activities. Activities include movement of livestock with horseback and ATV riders and vehicle traffic associated with allotment administration and management. Due to the relative low

quality of habitat, however, primarily from vegetation types but also from past management activities such as timber harvest and road building and high road densities, the likelihood of presence of the wolverine is small. Chances of effects from disturbance are small and may be immeasurable. They would not result in measurable adverse affects to individuals.

Cumulative Effects: The action alternatives would not result in measurable cumulative effects to wolverine or wolverine habitat. A combination of poorer quality existing habitat and the lack of direct and indirect effects to wolverine and wolverine habitat would not result in additional adverse effects to this species. Cumulative effects associated with past or present activities include those associated with timber harvest, resulting changes to forested habitat, and road building and subsequent high road densities in much of the project area. Changes to forested habitat include opening of canopies, and younger stand structure and age distribution of trees, resulting in an earlier seral, open forest condition. Road building and high road densities have increased potential for disturbance related to vehicle traffic. In the presence of human disturbance, wolverines often move to more remote habitats (Ruggerio et al. 1994).

Columbia Spotted Frog

Affected Environment

Columbia spotted frogs select for springs, small ponds and lakes, or sluggish stream habitats. Cold-water conditions appear important (Leonard et al., 1996), although information collected on the Ochoco National Forest indicates that there is a limit to water temperature and it's positive effect on these frogs. Columbia spotted frogs are an early to mid seral species formerly strongly associated with beaver ponds, pools, and braided willow wetland complexes. They do not necessarily benefit from increased shade and decreased water temperatures, especially at higher elevations. The Ochoco National Forest herptile coordinator did a same-time size comparison on the former Snow Mountain District comparing Sawmill Creek, at lower elevations, with Crowsfoot Creek at higher elevation. The frogs were noticeably smaller and less numerous in Crowsfoot Creek. Sedges, rushes and other similar aquatic habitat components are favored over habitats with more dense emergent vegetation. Aquatic and terrestrial vegetation located close to the shore provide important cover for the frogs, protecting them from predation and other environmental effects. All stages of their life cycle are associated with stream and wetland habitats. Movements between population areas or colonization of new or unoccupied habitat are influenced by the availability of wetted areas along corridors between those habitats. While degradation of associated riparian vegetation does influence survival and reproductive rates in Columbia spotted frogs, lack of such vegetation is not a barrier to movement. In this discussion, suitable habitat refers to habitat capable of providing for the yearly life cycle needs of Columbia spotted frogs.

Suitable and occupied habitat occurs within the project area. Presence in Deep Creek, near the confluence of North Fork Crooked River, was documented in 1993. The same survey effort identified individuals in the upper Happy Camp Creek drainage associated with Younger Spring. In 2004, during the North Fork Proper Functioning Condition Survey with the National Riparian Service Team and Ochoco National Forest personnel, adult Columbia spotted frogs were found in all stream segments surveyed on the

North Fork Crooked River from Williams Prairie to the forest boundary at Upper Falls. Younger Spring has been monitored for close to 15 years. There is a man made pond (road watering, fire control, livestock, and wildlife) at Younger Springs which is an important breeding pond for Columbia Spotted frogs using this area. (adult counts (visual) have ranged from 16 to 60 individuals. Tadpole estimates for spotted frog were in the 500 to 1000 range. Young froglets were estimated to be in the 400 to 500 range (personal communication, David 2005). Other streams in the project area were also surveyed, but additional detections were not noted. Suitable habitat in Little Summit Creek, near Little Summit Prairie, is also noted. Columbia spotted frogs are suspected in those habitats but are not confirmed. Other stream systems in the project area may also contain suitable habitats and/or populations, although amphibian surveys in 1993 did not detect this species elsewhere. The location of individuals in the upper Happy Camp Creek drainage suggests more widely distributed populations than what is currently known. Due to degraded stream conditions and intermittent stream flows, any populations in upper reaches of streams in the project area may be seasonably isolated from known populations in lower Deep Creek and North Fork Crooked River, as is the population located at Younger Spring.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: Alternative 1 would not result in adverse direct or indirect effects to existing populations or suitable habitat. The current condition of habitat would be maintained or see an improving trend. With anticipated improvements to stream channel function, cooler water temperatures, and better stream side cover habitats would be expected. Some populations may remain seasonally disconnected and isolated until such time as intermittent stream flows and suitable habitat develops and connects those populations. Some habitats may not recover due to their current condition. Some stream systems have eroded to bedrock, and without beaver activity or large wood inputs, would not develop deeper moist soil and wetland conditions needed to support Columbia spotted frog habitat. Portions of Little Summit Creek reflect this condition. With improving trends in stream flow and riparian habitat, decreased losses in individuals should lessen through lower predation rates and more stream resiliency to drought conditions.

Habitat conditions along lower Deep Creek and North Fork Crooked River, and those associated with Younger Spring in the upper Happy Camp Creek drainage, where habitat is currently occupied, would improve with this alternative. Grass and sedge cover along stream banks and in riparian wetland habitats would improve and expand throughout those areas. Willow and alder, as well as cottonwood, would expand and improve cover conditions for spotted frog habitat as well, and would do so at the quickest rate of improvement. Improved stream channel function may also improve stream temperatures, further enhanced by improved stream shading, and provide high quality habitat for the spotted frog.

Habitat conditions in potential habitat in upper Little Summit Creek would also improve, as slow, deep water habitats stabilize and expand. Shading from overhanging vegetation and improving willow and alder habitats would also improve habitat condition in these areas. Cover habitats from improved stream side sedge and grass communities, as well as cooler water temperatures, would provide higher quality habitat for the spotted frog. Wetland

habitats associated with riparian meadows would improve as water tables rise and inundate those habitats. As the wetted perimeter width expands, the "hydraulic sponge" capacity is increased with resultant cooler temperatures. The warmer surface water of larger pools and backwater habitats, however, would be the preferred habitat for better thermoregulation. Columbia spotted frogs seem to prefer sunnier pools with emergent and floating vegetation. Sedge and grass communities, in the absence of livestock utilization, would provide higher quality cover habitat. Populations of spotted frogs may become established in Little Summit Creek as habitat conditions and connectivity to source populations in Deep Creek become available.

Cumulative Effects: Numerous past Federal actions have affected the Columbia spotted frog and its habitat and have resulted in the degraded habitat condition that currently exists. Those actions include historic and current livestock grazing, road construction, trapping beaver out, timber harvest, and dispersed camping and other riparian associated recreation activities. These activities, cumulatively, have resulted in losses in pool habitats and off channel habitats such as oxbows in the Deep Creek drainage where the Columbia spotted frog exists.

Historic and current grazing has affected plant species diversity and over all condition in the riparian areas. A loss of diversity and adverse affects on many plant species has adversely affected the riparian habitat condition. Loss or substantial declines in riparian vegetation, particularly shrubs, hardwoods, grasses, and sedges, that occupy stream banks has made these banks more susceptible to erosion. In addition, livestock use of streams for water and access to stream edge vegetation has led to compacted and/or sloughed off stream banks, further altering the stream channel profile. These changes to stream channels have changed water table dynamics, lowering effective water tables. This has in turn adversely affected meadow and upland habitat. Incised meadows and riparian areas have moved from hydric soils which supported aquatic sedge and wet graminoid communities to drained soil phases which support drier mesic graminoid communities. These effects have occurred throughout most of the perennial flowing streams in the Deep Creek, Derr, Little Summit Prairie and the south half of the Happy Allotments. The changes to channel morphology have in part decreased survival rates of the populations that occur in the Deep Creek Watershed and project area.

Road construction, when occurring in riparian areas, has affected Columbia spotted frog habitat by affecting the function of riparian areas and the ability of stream channels to move within that functional riparian area. In other places, roads have intercepted stream channels, forcing them through culverts, further restricting channel movement in the flood plain, and possibly affecting water table function in the flood plain. Roads also work to channel away from stream channels, and they will also channel sediment from upland areas into stream systems. Changes in stream channel function and mobility in the flood plain, and the introduction of additional sediment into stream channels has adversely affected the habitat for the Columbia spotted frog by further degrading that habitat.

The removal of beaver from the stream systems by trapping and habitat degradation is also a significant factor in the decline of Columbia spotted frog habitat in the project area. Beaver were trapped out of the area in the 1800s to early 1900s. The loss of beaver has adversely affected stream channel morphology by the lack of presence of beaver dams and other beaver structures. Beaver activity also maintained hardwood communities in the

riparian areas by providing a periodic disturbance that regenerated growth coupled with elevated water tables in the meadows and along the riparian areas, promoting hardwood community development. The loss of these habitats, along with historic livestock and wild ungulate browsing, and road construction, adversely affected stream morphology and thus habitat for the Columbia spotted frog.

Limited timber harvest occurred within some of the riparian areas in the project area. The predominant effect, however, was the contribution of sediment from upland soil sources from timber removal activities. Roads and disturbed soil associated with the harvest activities provided sediment to several of the stream systems including Deep Creek and portions of Little Summit Creek and others.

Dispersed recreation activity in riparian areas has resulted in alterations to riparian vegetation communities, streambank and stream channel morphology and soil compaction. These effects have added to the cumulative effects of other actions that have fragmented and degraded spotted frog habitat in the project area.

Beneficial effects to the Columbia spotted frog are the activities associated with the Deep Vegetation and Watershed Restoration Projects in the Deep Creek Watershed. Activities include improvements to stream and riparian function through the decommissioning of roads, replacing culverts, repairing headcuts and streambank failures, reconstructing stream channels, constructing exclosures, and the planting of hardwoods along stream channels in the Deep Creek Watershed. Rehabilitation of dispersed recreation sites will also occur. These activities would improve habitat for the Columbia spotted frog. Tables 17 and 18 identify the projects that would improve habitat for the Columbia spotted frog in the project area.

Table 25 (Fisheries Section) identifies a list of exclosures that are within the project area. Many of these exclosures are associated with riparian or stream habitat, and will improve or protect potential or occupied habitat for the Columbia spotted frog in the project area. The specific exclosures are not analyzed for their benefit or improvement of spotted frog habitat. One exclosure, associated with the North Fork Crooked River, is located along occupied habitat.

Table 17: Deep Vegetation Management Project

Activities Improving Columbia Spotted Frog Habitat	Units
Riparian Planting	28 miles
Aspen Enhancement	81 acres
Willow Enhancement	2 sites
Meadow Enhancement	825 acres
Road Closure and Decommissioning	31.4 miles
Dispersed Recreation Site Rehabilitation	6 sites
Culvert Replacement	8 sites

Table 18: Deep Watershed Restoration Project

Activities Improving Columbia Spotted Frog Habitat	Units
Grazing Exclosures	227 acres
Riparian Pasture	342 acres
Headcut Stabilization	37 sites
Cutbank Revetments	18 sites
Channel Reconstruction	.25 miles
Culvert Replacements	35 sites
Road Decommissions and Reconstruction	30 miles
Road Closures/Inactivation	17 miles

This alternative would not contribute to the adverse cumulative effects described above. Indirect effects associated with improved habitat conditions in riparian areas may help to reduce the cumulative effects of past actions. Combined with the Deep Watershed Restoration and Vegetation Management Projects, more stable stream banks (reducing sediment inputs and providing cover through undercut banks), improved stream side vegetation (cover from overhanging and emergent vegetation), and elevated water tables (wetland development) would improve and expand habitat for the Columbia spotted frog. This would be particularly true in Little Summit Creek. Over the long term, recovery of reaches of lower Little Summit Creek may reverse or reduce the cumulative effects of past actions and improve connectivity between known occupied habitat in Deep Creek and North Fork Crooked River, and habitat in upper Little Summit Creek, near Little Summit Prairie. This would improve survival and movement of frogs into the upper reaches of Little Summit Creek.

Alternative 2 – Proposed Action

Direct and Indirect Effects: Alternative 2 would result in direct and indirect effects to Columbia spotted frogs and their habitat in the project area. There would be the potential for direct effects in the form of trampling egg masses. This potential effect is estimated to be very small since egg mass destruction is not viewed as a problem with June turn on dates due to the fact that the majority of eggs have hatched by this time (Personal Communication, David and Steele 2005).

The grazing of livestock would also result in disturbances to habitat. Disturbances to banks would occur in portions of habitat associated with lower Deep Creek and Little Summit Creek. Such disturbances would result in sediment inputs and site specific loss of cover provided by overhanging, undercut banks.

Livestock grazing under this alternative would continue to affect vegetative communities important to the frog habitat as well. Stream side grasses and sedges that provide cover habitat would be grazed. This may adversely affect annual and seasonal cover habitat in wetlands and along stream banks. The amount of cover removed through grazing would vary, with some areas having greater utilization levels than others. Grazing impacts are not necessarily detrimental if it is limited to short term seasonal grazing (Bull and Hayes 2000). Columbia spotted frogs benefit from early to mid seral habitat components as long as there is adequate thermal and security cover, that is, overhanging banks, some willow clumps, and large wood in the water (Nevada Division of Wildlife 2003). Under the proposed adaptive management strategy, utilization levels would be reduced due to the Non-functioning (Roba Allotment) or Functioning-at-Risk (Deep Creek, Little Summit Prairie Allotments) functional class assessments of their existing condition. Lower utilization standards should result in higher levels of retained cover along occupied stream systems, although site-specific variation would still exist.

With this alternative, a long term improving trend in riparian habitat condition would be expected. This would be in response to the flexibility built into the alternative in setting utilization levels and bank and soil disturbance standards for the grazing season. These modified standards would be based upon functional class as well as the condition of the pasture and/or allotment. Over time, this alternative would result in overall improved habitat conditions for the Columbia spotted frog. Expansion of habitat for this species would also be anticipated. This should reduce the level of mortality being suffered by this species due to sub-optimal vegetative cover conditions. Lower Deep Creek and Little Summit Creek would see these changes, and should result in less distance between patches of suitable habitat along these stream systems. Populations associated with the upper Happy Camp Creek Drainage/Younger Spring may also move more freely with populations in the Deep Creek drainage over the long term.

Hardwood communities would improve with the implementation of this alternative. The standards set for this alternative state that livestock grazing would terminate in a pasture once livestock switch to hardwood utilization. This, coupled with changes to utilization numbers and other management actions as a result of the Functioning-at-Risk or Non-functioning condition of occupied and potential habitat would further facilitate improvement to willow, alder, and cottonwood communities.

The three year rest and early season alternate year grazing proposal for the Riparian Pasture of the Roba Allotment would benefit Columbia spotted frog populations and habitat in that

pasture along the North Fork Crooked River. This system would allow continued improvement of this riparian habitat and its function for spotted frog populations. Riparian grasses and sedges would recover and improve in habitat condition as existing stream channel and riparian habitat allows. Reduced, early season grazing, when incorporated after the three year rest, would reduce grazing affects to the riparian plant communities. Improvements to riparian vegetation would continue on an improving trend. Hardwood communities, primarily cottonwood, alder, and willow, would continue to expand and develop along the North Fork Crooked River. This may allow for future beaver presence and further habitat enhancement.

The remainder of the Roba Allotment and the three year rest proposed would not benefit Columbia spotted frogs, as suitable habitat for this species does not exist in those remaining pastures.

Cumulative Effects: Alternative 2 would not affect the past adverse cumulative effects to Columbia spotted frog habitat from past, present, and reasonably foreseeable future actions described in detail under cumulative effects section for Alternative 1 due to all activities other than grazing. Some adverse direct and indirect effects would be anticipated from grazing in this alternative. These effects would be increased mortality to the frog population from reduced cover due to herbivory and potential egg mass trampling. Those effects, however, would be less than existing management. This would be the result of the adaptive management strategy and modified grazing standards that would be implemented, as well as the resting of the Roba Allotment and changes to the riparian pasture of that allotment. This would reduce the level of adverse cumulative effects that would occur with grazing, when compared to existing management. Beneficial cumulative effects associated with the adaptive management theme of this alternative, Deep Vegetation Management and Deep Watershed Restoration Projects would be affected by this alternative. Improvement to spotted frog habitat would continue with these actions.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects: Alternative 3 would have direct and indirect adverse effects to Columbia spotted frogs and their habitat. These effects would be similar to Alternative 2, though with a greater risk of severity due to the lack of flexibility in altering utilization, bank disturbance, and soil compaction standards. Sediment input and affects to stream side vegetation would likely be maintained at existing levels. This would affect available stream side cover and pool habitat conditions. In more heavily degraded stream reaches, cover from stream side sedges and rushes would be affected from herbivory and stream bank trampling. Cumulative loss of such cover habitats may be further exacerbated.

This alternative would also continue to suppress willow and alder habitat along lower Deep Creek and Little Summit Creek, affecting stream shading and bank stability, as well as limiting the potential for beaver habitat to be re-established in the project area. Lack of stream bank stability affects sediment input, further affecting pool habitats. Lack of stream shading affects cover habitat, and may adversely affect stream temperatures. These effects would be a continuation of existing management. The primary difference between Alternative 2 and 3 is the lack of change in management strategy for the riparian pasture of the Roba Allotment in Alternative 3. Existing habitat conditions along the North Fork

Crooked River would be maintained with this alternative. Annual livestock grazing would affect stream side cover provided by sedges and grasses.

Cumulative Effects: Alternative 3 would not affect the past adverse cumulative effects to Columbia spotted frog habitat from past, present, and reasonably foreseeable future actions described in detail under cumulative effects section for Alternative 1 due to all activities other than grazing. Some adverse direct and indirect effects would be anticipated from grazing in this alternative. These effects would be increased mortality to the frog population from reduced cover due to herbivory and potential egg mass trampling. The level of contribution to those adverse cumulative effects would be greatest with this alternative. Beneficial cumulative effects associated with the Deep Vegetation Management and Deep Watershed Restoration Projects would be affected by this alternative. There would be no beneficial effect due to an adaptive management theme from this alternative. The adverse direct and indirect effects would affect the rate of habitat improvement associated with these two actions. The rate of improvement of habitat for the Columbia spotted frog would be slowest with this alternative.

Summary: No Forest Plan standards apply directly to the Columbia spotted frog. Implementation of Alternative 1 and 2 would meet the desired condition described in Chapter One for the Columbia spotted frog. Habitat conditions would improve under these two alternatives. Alternative 3 would not likely meet the desired condition of habitat described in Chapter One. Implementation of existing management standards would likely maintain existing habitat conditions, or a slow improvement due to the cumulative beneficial effects of other actions in the project area.

Greater Sage- Grouse

Affected Environment

Habitat: The greater sage-grouse is a sagebrush obligate species that inhabits sagebrush shrub-steppe habitat in the western United States (Connelly et al. 2004), including the shrub-steppe habitats of the Great Basin and Columbia Basin Regions around the Ochoco National Forest (Connelly et al. 2004, ODFW 2005). The project area provides habitat for sage-grouse populations in the Upper Crooked River Basin. Habitat in this basin is composed of big sagebrush (*Artemesia tridentata),* low sagebrush *(Artemesia arbuscula)* and silver sagebrush (*Artemesia cana)* plant communities. Sage-grouse habitat in the basin also includes wet meadows, mesic riparian areas, and grassland areas, including irrigated fields. The majority of the suitable habitat is located on private and lands administered by the Bureau of Land Management. Some habitat is also found on lands administered by the Ochoco National Forest. The Westside Allotments Project Area includes some Forest Service administered habitat.

Table 19 summarizes the amount of sagebrush shrub-steppe habitat by each allotment and the project area as a whole. This table summarizes the total number of acres of two of the three shrub-steppe types found in the project area, broken down by allotment. Silver sagebrush is an associate of riparian habitats and the acreage of that type is displayed as riparian acres in Table 20.

Table 19: Summary of Sagebrush Shrub-Steppe Habitat Types by Allotment

		Allotments					
		Roba	Deep Creek	Little Summit Prairie	Derr	Happy	Project Area
Acres		17,936	17,581	16,638	12,638	18,630	83,423
Shrub-Steppe Habitat Type	Low (acres/% area)	70 <1%	368 2%	695 4%	106 1%	- -	**1,239** **1%**
	Mtn. Big (acres/% area)	201 1%	687 4%	1,143 7%	883 7%	541 3%	**3,455** **4%**
		271 **2%**	**1,055** **6%**	**1,838** **11%**	**989** **8%**	**541** **3%**	**4,694** **6%**

Sage-grouse habitat comprises only 6% of the project area. In looking at each allotment displayed in Table 19, Little Summit Prairie has the best mix of habitat, although it is still a relatively small percentage of the allotment, and fairly fragmented by forest and open scab communities. While there is 3,455 acres of mountain big sagebrush habitat present in the project area and the allotments, most of those habitats (85%) are in a conifer/sagebrush community type and have relatively high stocking levels of ponderosa pine, Douglas-fir and/or western juniper which essentially makes the habitat unsuitable for sage-grouse. The remaining mountain big sagebrush habitat, with the exception of those surrounding Little Summit Prairie, is fragmented and occurs in small patches, averaging less than 50 acres in size.

The overall habitat quality and condition across the project area and the individual allotments is relatively poor, particularly when compared to higher quality habitat located to the south of the project area on lands administered by the Bureau of Land Management and private lands. These lands do not have the capability to support productive and denser conifer forests and the patches of mountain big and low sagebrush communities are larger and more contiguous in extent (Hanf et al. 1994).

The poor nature of habitat within the project area is reflected in the very limited number of sightings of sage-grouse and in the limited radio collar data collected in the middle 1990s. Only one documented sighting of sage-grouse exists in the project area.

Table 20 shows the result of a query of the Forest GIS databases, looking at the presence and amount of mesic meadow habitats in the five allotments. Mesic meadow and riparian habitats that could potentially provide habitat for sage-grouse comprise only 2% of the project area, with 47% of that habitat in the two northern most allotments (and the greatest distance from occupied habitat +/– 11 miles), Happy and Derr Allotments. With the exception of Little Summit Prairie, the mesic habitats in Roba, Deep Creek, and Little Summit Prairie Allotments tend to be small, averaging between 5 and 25 acres.

Table 20. Mesic Habitat Analysis for Westside Allotments

	Allotments					Total Project Area
	Roba	Deep Creek	Little Summit Prairie	Derr	Happy	
Acres of Area	17,936	17,581	16,638	12,638	18,630	83,423
Acres of Habitat	61	126	886	253	694	2,020
Mean Patch Size, Acres	61 (only one patch)	5	25	6	5	8
Percent Area	<1%	<1%	5%	2%	4%	2%

Only two percent of the project area is identified as a mesic habitat. Little Summit Prairie Allotment contains the most, followed by the Happy Allotment. Total acres and percent of the allotments and total project area is very small, certainly when compared to the importance of this habitat type for late summer and early fall habitat selection (Connelly et al. 2004, Connelly et al. 2000, Hanf et al. 1994). The average patch size also indicates that most of the patches are small in nature, with the exception of the Little Summit Prairie Allotment. And with the exception of Little Summit Prairie, and some of the meadow complexes associated with the upper Little Summit Creek, most of the mesic habitats are not associated with low and mountain big sagebrush communities that are often cited for habitat utilization (Connelly et al. 2004, Connelly et al. 2000). In combination with the limited and fragmented nature of the low and mountain big sagebrush communities, the low density and fragmented nature of existing mesic habitat in the project area likely precludes extensive habitat use by greater sage-grouse in the project area.

Populations and Distribution: Within the project area, there is one sighting noted in the wildlife sightings database, which includes the telemetry study. This sighting was of four birds, identified as adults and occurred in the month of September. This would be consistent with brood or late summer habitat use, and was located along the middle/upper Little Summit Creek. The remaining detections in reasonable proximity to the project area are on private lands or lands administered by the Bureau of Land Management one to six miles south. These sightings are associated with a known lek in that area.

The associated leks to the south of the project area are small, but relatively stable. Lek counts data indicate stable populations of 15-25 males per lek over the past ten years. Compared to other lek/populations in the upper Crooked River basin, this is a typical size and trend. Compared to lek/populations in the greater Crooked River basin, upper Deschutes River basin, and northern end of the Great Basin, this is a typical population size (Hagen 2004, Hanf et al. 1994). The populations associated with these leks are the northern most populations in Central Oregon.

Given this information, use of habitat in the project area is suspected to be highly limited and probably reflect only occasional use of the project area at the current time. The limitations of the habitat, particularly late season mesic meadow habitat, suggest that the project area is not a high quality habitat area at a landscape scale.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: Implementation of Alternative 1 would result in no adverse grazing related effects to sage-grouse habitat in the project area, and thus no adverse effects to sage-grouse. No consumption of herbaceous forage, primarily in the form of forbs, but also some grasses and sagebrush, would occur from livestock as they would not be present. This would allow for the maximum amount of forage habitat available for sage-grouse utilizing the project area. This would be particularly important to sage-grouse in the low and mountain big sagebrush habitats in the Roba, Deep Creek and Little Summit Prairie Allotments. These allotments contain habitat most likely used by sage-grouse originating from the leks to the south of the project area. Approximately 6,700 acres of shrub-steppe and mesic meadow habitat would be affected.

There would be no direct or indirect adverse effects to the condition and quality of the sagebrush canopy and understory vegetation as there would not be herbivory to these plants with the absence of livestock. This alternative would provide the highest quality of cover habitat for sage-grouse.

This alternative would also allow for the greatest rate of recovery for shrub-steppe and mesic meadow and riparian habitat in the Roba, Deep Creek and Little Summit Prairie Allotments, to the extent that recovery can occur. This would result in positive indirect effects to sage-grouse habitat. Some of these habitats may be permanently changed, at least without extensive and expensive restoration actions that are not a part of this project. This is particularly true in many of the riparian areas associated with Deep Creek, Little Summit Creek, and tributaries of these stream systems. Where conditions would allow recovery, increases in diversity of forbs species associated with the shrub-steppe and meadow habitats would result. The time frames for which these effects would be realized would be in the mid to long term, as larger scale riparian function improves. For some communities such as some of the shrub-steppe communities in the Little Summit Prairie Allotment, this may be as short as several years, while others like the mesic habitats in Little Summit Prairie and Deep Creek Allotments may take many years or decades. This is particularly true in riparian areas where adverse stream channel modification has occurred. Shrub-steppe habitats, particularly, the low and mountain big sagebrush habitats would see an improvement to canopy cover habitat. This would occur through the absence of mechanical damage. Again, time frames for these effects varies, and could be as short as several years with absence of damage to existing shrubs, to many years with the time needed for new plants to take seed, sprout, and develop.

Potential nesting habitat in mountain big sagebrush communities would not likely change or develop under this alternative. While the absence of grazing would improve carry over grass and forb structure into the following nesting seasons (providing important nesting cover [Connelly et al. 2004, Connelly et al. 2000, Hanf et al. 1994]), other factors affecting

nesting habitat quality would not be addressed with this alternative or project. As noted in the existing condition discussion, much of the mountain big sagebrush communities, particularly those closest to the active leks (Roba Allotment), have aged successionally and in the absence of the natural fire cycle. In these areas, ponderosa pine, western juniper, and other conifers have established and increased in density (Appendix F, Photos 8, 11, and 12). Without near complete removal of these conifers, these habitats will not function as nesting habitat. This alternative does not propose conifer removal.

Effects to currently existing individuals and populations would likely be small. The relative use of the project area is so low that any changes to habitat condition will have a negligible affect upon populations. Future study of the populations associated with the project area may reveal more information on the extent of actual habitat use. At this time, however, the level of use is believed to be low based upon only one sighting in the project area and the general lack of high quality habitat in the project area.

This alternative would result in the highest quality and condition of sage-grouse habitat in the Roba, Deep Creek, Little Summit Prairie, Derr, and Happy Allotments. The implementation of this alternative would prevent livestock utilization of potential forage and affects to sage-grouse habitat in the project area. Improvement to currently degraded habitats would improve at the greatest rate with this alternative.

Cumulative Effects: Based upon the Sage-Grouse Conservation Assessment and Strategy and upon the recent petition finding of the U.S. Fish and Wildlife Service the major historic actions that have affected sage-grouse populations were habitat conversion, habitat fragmentation, human disturbance, man-made facilities such as powerlines and fences, grazing, increases in invasive species and noxious weeds, and the discontinuance of intensive predator control (ODFW 2005 and USFWS 2005). This alternative does not propose to add to any of these identified adverse cumulative effects on sage-grouse other than through degradation of existing habitats through lack of action as described below.

Historic grazing, particularly the documented over-grazing of sheep and livestock near the turn of the century, has affected some plant community types. Shallow soils, low precipitation, and low overall productivity make shrub-steppe habitats particularly vulnerable to over grazing. This can result in changes in species composition of grasses, forbs and shrubs in these habitats, many times resulting in the establishment of invasive or noxious plant species. In general, such changes are detrimental to sage grouse (Connelly et al. 2004).

Fire suppression effects are associated with the changes in plant community composition because of the absence of fire as a disturbance event. The conifer/mountain big sagebrush communities have seen the greatest level of effect from fire suppression. With the suppression of fire, conifer densities have generally increased in these habitats, to densities that essentially leave the habitat Non-functioning. To a lesser degree, conifer encroachment into meadow and riparian habitats through the exclusion of fire has reduced the availability of those habitats to sage-grouse. This is particularly prevalent along Little Summit Creek and around the edge of Little Summit Prairie. A limiting factor in the presence of sage-grouse is the availability of mesic meadow and riparian habitats for use in brood rearing. The loss of these habitats to conifer encroachment can be significant to sage-grouse presence and habitat use. Under Alternative 1 the encroachment of conifers into these important habitats will continue because of the suppression of most wild fires.

Road building and recreational use in riparian areas are also detrimental to quality sage-grouse habitats. These features can lead to direct mortality to the birds through indiscriminate shooting, direct habitat loss, facilitation of predation, and facilitation of the spread of invasive and noxious plant species. Sage-grouse are also very likely to abandon nests during laying and incubation if disturbed and flushed off of nests (USFWS 2005).

Invasive species change vegetation communities, and more desirable forbs and grasses and sagebrush habitats often lose to those infestations. Connelly et al. recognized the significant adverse effects invasive species have on sage-grouse habitat quality (2004). Cheat grass is perhaps the most well known invasive species that is permanently altered sage-grouse habitat, but others are also having an effect (Connelly et al. 2004, Connelly et al. 2000). The effects of invasive species are further compounded by the other actions described above, in both taking advantage of disturbances created by actions such as livestock grazing, road building, and recreational use of habitats, and simultaneous use those actions as distribution vectors to spread out across the landscape. Invasive species issues are relatively small in the project area, with the exception of the Roba Allotment and portions of the Deep Creek and Little Summit Prairie Allotments. Here, houndstongue is particularly abundant and could be affecting habitat quality for sage-grouse, particularly in the mesic riparian habitats. Houndstongue has replaced more palatable forbs and grasses in these areas. Please refer to the discussion on noxious weeds and other invasive plant species in this document.

The Deep Watershed Restoration and Vegetation Projects will implement stream and riparian habitat enhancement projects in the Deep Creek Watershed. Protection and reconstruction of stream habitat and riparian areas, reversing of existing stream channel degradation, and the closure of roads will be implemented with this project. Activities will also involve the planting of hardwoods and exclosure construction to improve riparian habitats. These activities will help to reverse some of the adverse cumulative effects of activities described above. Riparian meadow habitat along Little Summit Creek in particular would improve with this project. Other actions that will have incremental benefits to sage-grouse habitat include the rehabilitation of dispersed recreation sites, culvert replacement, and road decommissioning. A total of 4,549 acres of juniper encroachment reduction is also proposed, some of which would benefit sagebrush communities and improve habitat quality for sage-grouse. Tables 21 and 22 list the activities proposed that would benefit sage-grouse habitat.

Table 21: Deep Vegetation Management Project

Activities Improving Sage-grouse Habitat	Units
Riparian Planting	28 miles
Aspen Enhancement	81 acres
Willow Enhancement	2 sites
Meadow Enhancement	825 acres
Road Closure and Decommissioning	31.4 miles
Dispersed Recreation Site Rehabilitation	6 sites
Culvert Replacement	8 sites
Wildlife/Juniper Encroachment Treatment	4,549 acres

Table 22: Deep Watershed Restoration Project

Activities Improving Sage-grouse Habitat	Units
Grazing Exclosures	227 acres
Riparian Pasture	342 acres
Headcut Stabilization	37 sites
Cutbank Revetments	18 sites
Channel Reconstruction	.25 miles
Culvert Replacements	35 sites
Road Decommissions and Reconstruction	30 miles
Road Closures/Inactivation	17 miles

Alternative 1 would contribute to adverse cumulative effects to Greater sage-grouse habitat from past, present, and reasonably foreseeable future actions through allowing successional advancement in the mountain big sagebrush/ponderosa pine habitats and through allowing encroachment into mesic meadow and riparian habitats. No cumulative effects will be added to the other threats to sage-grouse previously discussed. Indirect effects, associated with habitat improvement in the absence of livestock grazing, would contribute to the beneficial cumulative effects associated with the Deep Vegetation Management and Watershed Restoration Projects that will be implemented in the near future. The lack of livestock grazing would further enhance the improvement of sage-grouse habitat that will result from those activities. Habitat would improve over time from these cumulative beneficial effects, and would do so at the greatest rate under this alternative.

Direct and Indirect Effects Common to Alternatives 2 and 3: Based upon the Sage-Grouse Conservation Assessment and Strategy and upon the recent petition finding of the U.S. Fish and Wildlife Service the major historic actions that have affected sage-grouse populations were habitat conversion, habitat fragmentation, human disturbance, man-made

facilities such as power lines and fences, grazing, increases in invasive species and noxious weeds, and the discontinuance of intensive predator control (ODFW 2005 and USFWS 2005). The grazing proposals under Alternatives 2 and 3 would affect the habitat degradation problem identified in the Sage-Grouse Conservation Assessment and Strategy and the U.S. Fish and Wildlife Service's petition finding.

Few studies exist that have directly addressed the effect of livestock grazing on sage-grouse and there is little direct experimental evidence linking grazing practices to sage-grouse population levels (USFWS 2005). Both alternatives could have similar direct forage competition effects upon forage availability, particularly earlier in the grazing season, if excessive grazing (more than 50 percent utilization) were to occur (Call and Maser 1985). The level of utilization of forbs in these communities in any given grazing season would be dependent upon the intensity of use of that particular pasture. Early season of use in pastures where shrub-steppe habitats are present would result in a higher grazing preference for forbs and other succulent forage. Water is generally better distributed and forage more succulent across the landscape, allowing livestock to spread out and utilize uplands more completely, thus reducing the grazing intensity on any individual acre. Additional distribution management activities, including salting and use of riders to better distribute livestock would result in more even utilization of these upland areas. Habitat in all pastures of the Deep and Roba Allotments, as well as the Little Summit Prairie Allotment would be affected by early season use.

Late season use of such pastures, however, would likely result in little or no indirect effects to forage availability for sage-grouse in the shrub-steppe habitats. Late season grazing in such a pasture appears to result in little forage utilization in upland areas, particularly the dry shrub-steppe communities (Hockett 2002). Utilization would not occur because most of the forbs and other herbaceous forage would be desiccated and not palatable to livestock at that time. Sage-grouse would utilize wetter, mesic habitats as those upland forbs and grasses cured and were no longer palatable (Connelly et al. 2004, Hanf et al. 1994, Hockett 2002). The conversion from shrub-steppe to mesic riparian habitats likely occurs by early July and continues through August and September in the project area. Grazing of these wetter, mesic habitats in late summer could be a benefit to sage-grouse habitats. Evans (1986) found that sage-grouse used grazed meadows significantly more during late summer than non-grazed meadows because grazing had stimulated the re-growth of forbs. Klebenow (1982) noted that sage-grouse sought out and used openings in meadows created by livestock grazing in northern Nevada. Grazing tends to delay maturation of forbs, especially common dandelion and yarrow. Forbs become available throughout the summer and re-growth is higher in crude protein and lower in crude fiber (Adams et. al. 2004)

Monitoring of the low sagebrush communities in late summer 2004 indicated very little livestock utilization of the forb forage in these habitats. This is likely due to early curing of those succulent forage types in the dry shrub-steppe habitats. This was noted when Photos 1-5 of Appendix E were taken in late August of 2004. Those photos originate from the south end of the South Pasture of the Deep Creek Allotment. Desiccated forbs and other succulent forage sources were present and abundant in this low sagebrush community. This may indicate that these dry shrub-steppe habitats are simply not used much by livestock, regardless of season of use, and thus further reducing the potential effects to sage-grouse.

Both alternatives would result in minimal or negligible effects to the quality of the sage brush canopy and cover provided by it. Based upon late summer monitoring of low and mountain big sagebrush habitats in the project area, use of the sagebrush habitats does not appear to affect the quality and condition of sagebrush canopy. No notable damage to sagebrush crowns or densities was noted.

Alternative 2 and 3 would not have measurable effects upon populations and individuals. This would primarily be due to the limited use of that habitat by sage-grouse. Limits to habitat quality as described in the existing condition may make these effects negligible simply because few sage-grouse are present in the project area.

Alternative 2 – Proposed Action

Direct and Indirect Effects: Alternative 2 sets up a frame work for adaptive management of livestock, based upon the functional class determination for the allotment. This alternative then provides different ranges of utilization for herbaceous and upland woody plants, streambank damage, stubble heights and soil disturbance levels, based upon that functional class rating. This alternative would be more responsive to poor habitat conditions for sage-grouse, and with appropriate changes to the above factors, would allow for a greater rate of recovery and improvement to habitats for sage grouse. Current functional classifications described in this assessment already take into account problems with the condition of the habitat. With implementation of this alternative, changes in the above factors would be implemented, including the extended rest of the Roba Allotment from all grazing for a period of three years. During the U.S. Fish and Wildlife review of petitions to list the sage-grouse under the Endangered Species Act, their panel of experts also noted that "proper grazing management may be a beneficial tool for enhancing greater sage-grouse habitats where maintenance and enhancement of these habitats is identified as an objective, although this has not been rigorously tested" (USFWS 2005).

Limitations to these improvements would exist. As described in Alternative 1, some systems simply would not change or improve because of the level of degradation that has occurred from historic actions (see cumulative effects section for more details on those changes). Degraded mesic habitats have lost some of their riparian vegetation components, including forbs and other potential forage for sage-grouse. This has resulted because of degraded stream channel function lowering water tables so they no longer sub-irrigate the channel floodplain. Vegetation composition has changed from wet meadow/riparian to dry meadow/shrub-steppe or forest species compositions. Mesic riparian habitats associated with some reaches of Deep, Little Summit, and other perennial streams in Deep Creek, Little Summit Prairie and Roba Allotments are not likely to recover in a way that provides habitat for sage-grouse for a long time period, due to the extent of damage to the riparian and floodplain function.

Alternative 2 would rest the Roba Allotment for a minimum of three years. This rest is in response to the Non-functioning assessment for the entire allotment. This would improve habitat conditions for forage on the shrub-steppe habitats in the allotment. This would also eliminate the potential for competition for forage during the early summer season. Rest of this allotment would also allow for more effective control and reduction in the noxious weed populations in the project area. Houndstongue is the most common noxious weed in the project area; however, others also exist, and would be treated through this 3 years

period, and beyond. The lack of livestock grazing during this time period would improve chances of success in controlling the noxious weed infestations by removing a primary vector in transport of seeds. Control and reductions of noxious weeds would improve habitat conditions for sage-grouse.

Cumulative Effects: Alternative 2 could contribute to the cumulative effects of past, present and reasonably foreseeable future activities that affect or have affected sage-grouse described in more detail in the cumulative effects section of Alternative 1. This alternative would continue livestock grazing under the proposed standards and with the proposed mitigations described in Chapter Two. The alternative, as described in Chapter Two, prescribes grazing intensities that would not exceed 40% use of available forage and thus should be consistent with Call and Maser's (1985) recommendations to avoid direct forage competition with sage-grouse for succulent forbs. The 40% use standard is an average for the allotments, so there could be use exceeding that standard in small areas and thus there is the possibility of competition in small portions of the analysis area. This alternative is also designed to improve the Functioning class of those pastures that are either Non-functioning or Functioning-at-Risk, while maintaining grazing as an authorized use of the project area. For pastures that are Properly Functioning, the existing condition would be maintained. The pastures of the Roba, Deep Creek, Little Summit Prairie, Derr, and East and West Pastures of Happy Allotments are either Non-functioning or Functioning-at-Risk. Implementation of this alternative would rest the Roba pastures, change the grazing strategy for the Riparian Pasture of the Roba Allotment, and reduce the intensity of grazing below the 40% standard on the remaining pastures. This could result in the direct effects to sage-grouse described above. Cumulatively, this would add to the effects of past livestock grazing, which has altered some plant communities, possibly making them less suitable for sage-grouse (low sagebrush habitats) and slow the rate of recovery, as they are able to recover, in those communities. Upland shrub-steppe habitats grazed early season would be affected most by this cumulative effect.

The indirect effect of direct competition for forage upon sage-grouse would be the reduced body condition of the birds. This is particularly important for pre-laying hens, as forbs provide essential calcium, phosphorus and protein. A hen's nutritional condition affects nest initiation rate, clutch size and subsequent reproductive success (Connelly et al. 2000). Due to the limited expected use of those habitats, however, those effects may be negligible or immeasurable.

Over the long term, with the attainment of the goal of a Properly Functioning condition for all pastures, cumulative effects upon sage-grouse and sage-grouse habitat would be reduced. Some habitats, however, would not likely recover to fully Functioning condition due the loss of some plant species and function of riparian and stream habitats. This includes some of the low sagebrush shrub-steppe habitats in the Roba, Deep Creek and Little Summit Prairie Allotments, and some riparian habitats in the Deep Creek and Little Summit Prairie Allotments.

The extent of cumulative effects would be reduced in the Roba Allotment, where this alternative proposes a minimum of three years rest for the pastures in this allotment. This is due to the Non-functioning classification determined by this analysis. This rest would continue until several resource issues, including invasive species and riparian habitat conditions improve. This rest would address some of the cumulative effects of past

actions, most notably invasive species invasion, that have adversely affected sage-grouse habitat.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects: Alternative 3 would have similar adverse direct and indirect effects to sage-grouse habitat as those described in Alternative 2. The primary difference would be in the still slower rate of recovery, or a continued downward trend in habitat quality of some of the mesic riparian and meadow habitats in the Little Summit Prairie Allotment. Livestock utilization levels would be higher in this alternative varying from a low of 40% use in forested and shrubland areas in Little Summit Prairie Allotment to a high of 55% use of grassland communities in Deep Creek, Derr, Happy and Roba Allotments. The opportunity for direct competition for forbs between livestock and sage-grouse would be higher in this alternative, with standards exceeding recommended use levels in the grassland communities. Also, the goals of riparian function, lack of soil disturbance and noxious weeds would not be included in this alternative and therefore adaptations to management would not occur to achieve these goals. This would affect the quality and condition of late season brooding habitat for sage-grouse. Due to the limited expected use of those habitats, however, those effects maybe negligible or immeasurable.

Cumulative Effects: This alternative would continue to contribute to the cumulative effects of the actions and activities described under the cumulative effects section of Alternative 1. The extent of those cumulative effects are dependent upon decisions outside the scope of this analysis, most notably the season of use and pasture use decisions associated with annual allotment implementation plans. As described in the direct and indirect effects section, the extent of effect on the shrub-steppe and mesic riparian and meadow habitat is dependent upon season of use.

It would be likely that this alternative would maintain or further degrade current habitat conditions for sage-grouse. Of particular concern would be the mesic riparian and meadow habitats in the Deep Creek and Little Summit Prairie Allotments.

Summary: No Forest Plan standards apply directly to the Greater sage-grouse. Implementation of any of the three alternatives would not meet a desired condition for nesting habitat. This is due to limiting habitat conditions that are outside the scope and effect of the alternatives proposed. Alternative 1 would provide the highest quality of foraging habitat, with the best distribution; Alternative 3 would provide the lowest quality of foraging habitat and a generally poorer distribution. Alternative 2 would provide an intermediate level of forage habitat and distribution when compared to Alternatives 1 and 3. Alternative 1 would meet the desired condition for foraging habitat in the mid to long term. Alternative 2 would meet the desired condition for foraging habitat in the long term. Alternative 3 may meet the desired condition in the long term, given that riparian habitat conditions were to improve. If not, Alternative 3 would not meet that foraging habitat desired condition.

Gray Flycatcher

Affected Environment

The gray flycatcher uses a combination of shrub-steppe and conifer woodland habitats in the Great Basin region of the Western U.S. (Marshall et al. 2003). Ponderosa pine and western juniper, with sagebrush and/or bitterbrush understories are often selected for nesting and foraging habitat . Nesting occurs relatively low to the ground. The species migrates well south every winter, returning late April/early May (ibid.).

Approximately 7,600 acres of potential or suitable habitat for the gray flycatcher exists in the project area, and includes juniper and ponderosa pine woodlands that are generally associated with some sagebrush shrub-steppe or other shrub habitat type. Most of these habitats exist in the Roba, Deep and Little Summit Prairie Allotments although some isolated ponderosa pine woodland/mountain big sagebrush communities do exist in the other allotments. Habitat for this species is generally good, with an abundance of tree structure mixed with the sage-grouse habitat. Insects, used as forage, are likely abundant as well. This species is suspected in the project area with unconfirmed sightings existing for the Roba Allotment and allotments outside the project area.

Environmental Consequences

Direct, Indirect and Cumulative Effects: Suitable habitat in the project area would not be affected by any of the three alternatives. Primary habitat that is present includes the ponderosa pine and juniper woodlands and associated shrub-steppe habitats that are present on 7,600 acres of habitat, most of which is in the Roba, Deep, and Little Summit Prairie Allotments. These habitats would not be impacted by any of the three alternatives. The No Action Alternative would result in no change to habitat conditions, as in general, they are functioning and meeting the needs of this species. The two action alternatives would not result in effects that would alter the function of the habitat for the gray flycatcher. Suitable nesting, foraging and roosting/perching habitat would be maintained. Any mechanical damage that may occur to the shrub-steppe habitats from livestock presence would be minor, and would not effectively change the function of those habitats.

Fisheries

Introduction

The Westside Allotments Environmental Analysis Project Area spans two drainages, the Crooked River and the John Day River. Keeton, Fry, Mac, and Fort Creeks drain north into Mountain Creek and the mainstem John Day River at Picture Gorge, while Deep Creek and all other streams flow south into the North Fork Crooked River, Beaver Creek, and eventually the Crooked River. This area includes 27 distinct, named streams, of which, 24 are fish-bearing (see Figure 6). Most of these streams are small, spring-fed and perennial, while a few in the Roba Allotment are intermittent and do not support fish. Streams of the Happy and Derr Allotments are steep, snowmelt-driven anadromous streams that flow colder year-round due to their north aspect.

Two special status fish species, steelhead and redband trout, exist within the Westside Allotments Project Area. Mid-Columbia River steelhead trout (*Oncorhynchus mykiss*) are listed under the Endangered Species Act as threatened, and interior redband trout (*O. mykiss gairdneri*) are on the Regional Sensitive Species list. Both of these fish are also Ochoco National Forest Management Indicator Species. Other TES species include the bull trout (*Salvelinus confluentus*), which does not exist in the Ochoco National Forest, and Chinook salmon, which are not known to inhabit the middle Mountain Creek subwatershed (which includes portions of the Happy and Derr Allotments).

Data used for this analysis comes from: 1) population information Oregon Department of Fish and Wildlife (ODFW 2003); 2) spawning surveys (ODFW 2004); 3) visual observations; and 4) United States Forest Service (USFS) habitat data.

Unlike timber harvest and other site-specific forest management activities, livestock grazing is spatially distributed across much of the landscape. Within the Westside Allotments Project Area there is considerable variability in geophysical and climatic conditions, complex vegetative patterns and responses, considerable temporal variability, and issues with year-to-year permit administration and compliance that make quantitative prediction of direct, indirect, and cumulative effects extremely difficult. There is also no available supporting literature to help predict the effects of livestock grazing to channel morphology, riparian function and sediment production at the watershed scale. Therefore, this analysis will be largely qualitative and will describe effects and differences between alternatives in terms of relative magnitude and trend. The generalized effects of livestock grazing on riparian vegetation and stream channels are very well documented (see Belsky et al. 1999, Elmore and Kauffmann 1994, Ohmart 1996, Platts 1991 for examples) and are used to support these determinations of impact.

Affected Environment

There are approximately 5.1 miles of known, occupied steelhead habitat and 78.2 miles of redband trout habitat within the planning area (Figure 6). Redband trout populations throughout much of the project area can be characterized as “very depressed” (ODFW 2003). A joint USFS and ODFW study undertaken from 1997-2003 on Deep Creek redband trout populations has documented a marked population decline. No particular age-class declined markedly compared to one another, suggesting a reduction due to non-selective influences. The study concluded that drought largely caused the population crash and that fish numbers will not likely recover until normal climatic conditions return. It also states that low-quality habitat conditions have left these populations susceptible to climatic and anthropogenic disturbances. Additionally, a water-born pathogen (*Ichthyoptherius multifilis*) in Little Summit Creek in the summer of 1998 resulted in approximately 60% mortality among the redband trout and speckled dace (*Rhinichthys osculus*) populations within a two mile reach.

Quantitative redband trout population estimates are not available for other streams in the Westside Allotments Project Area, although visual observations suggest very low numbers in streams within the Roba Allotment. Many of these streams are intermittent by mid-summer and fish become isolated in pools cut off from one another, often until higher flows return, or die when their resources are used up.

Within the planning area, steelhead trout only occupy tributaries to the John Day River, which includes streams of the middle Mountain Creek subwatershed (Happy Allotment,

North Pasture, and Derr Allotment, West Pasture). ODFW has been conducting steelhead redd counts in the John Day basin since 1959, however, minimal data exists for the Mountain Creek Watershed. Spawning surveys in Mountain Creek during 1986 and 1970 showed 6.0 redds/mile and 3.0 redds/mile, respectively (ODFW 2004). Although this would seem an upward trend, it is difficult to assess meaningfully due to the small and now-dated dataset. Additional information about steelhead spawning on the north slope of the Paulina Ranger District suggests a downward population trend in Rock Creek and no clear pattern in Cottonwood Creek (both outside of the project area).

Further discussions about both fish populations and their habitat can be found in the Deep Vegetation Management EIS (USFS 2004a), Deep Creek Watershed Restoration EA (USFS 2004b), Deep Creek Watershed Water Quality Restoration Plan (WQRP) (USFS 2001), Deep Creek Watershed Analysis (USFS 1999), Deep Creek Redband Trout Migration Study (ODFW 2003), and the Redband Trout Investigations in the Crooked River Basin (Stuart et al. 1996). The information in these documents relates to a significant portion of the Westside Allotments Project Area (66.7 % lies within the Deep Creek Watershed) but cannot completely describe conditions across all subwatersheds.

Stream channel habitat features (width to depth ratios, streambank stability)

PACFISH/INFISH defines Riparian Management Objectives (RMO's) for pool frequencies, width to depth ratios, bank stability, and large woody debris levels (USDA 1995; USDA and USDI 1994). These metrics were used as part of the analysis to determine functional classes for each pasture (see Table 22, Appendix C): Current Condition Evaluation for Stream Reaches for complete dataset and analysis). Stream channel conditions should be moving toward attainment of these objectives and the aforementioned desired future conditions. Attainment of these objectives (or those watershed-specific targets determined through the watershed analysis process) is critical to the long-term stability and health of native fish populations. Non-attainment of these goals within a reasonable timeframe (one to several decades) may endanger local stocks and wither their ability to cope with climate change.

In summary, most stream reaches within the project area exhibit high width to depth ratios, low pool frequencies, and low quantities of large woody debris as compared to RMO's. Stream survey data indicates that only Keeton, Fry, Fort, Mac, and portions of Crazy Creek are currently providing high quality fish habitat throughout their lengths; visual observations confirm this. Although natural potential varies both by stream type and local geomorphic and vegetative factors, many streams are indeed still not Properly Functioning within the analysis area.

Although few data can empirically support this claim, it is widely believed that degraded stream conditions in the Westside Allotments Project Area are a cumulative result of timber harvest (especially in riparian areas), high road densities (near or above LRMP standards), inadequate road-stream crossings (undersized culverts), fire suppression (producing vegetation outside the Historic Range of Variability (HRV), and heavy livestock and ungulate grazing (over utilization). These activities affect stream systems differently from one another (i.e., location, magnitude, duration, timing, and intensity). Forest management has traditionally dealt with these problems individually, despite their interrelated nature. The Deep Vegetation Management EIS and Deep Creek Watershed Restoration EA would

address many of these problems holistically, however, they both cite the need for a comprehensive, integrative livestock grazing management plan to facilitate vegetative and stream channel recovery.

A more detailed analysis of bank stability conditions and width to depth ratios for all streams within the planning area can be found in Appendix C, page 226, Table 23. More stream reaches are impaired because of high width to depth ratios than for excessive bank instability. PACFISH/INFISH standards were used to make this determination, although it should be noted that width to depth ratios are expected to naturally vary by stream type and may not actually be appropriate for all reaches (Rosgen 1996). PACFISH/INFISH deems width to depth ratio values of less than ten to be desirable, however, this ratio is only used to describe existing condition and future analysis should examine width to depth ratios appropriate for each potential stream type. Many streams in the planning area still, however, exceed the width to depth ratios expected for the stream type.

Streams that are continuing to widen exhibit high levels of streambank instability and simplified in-channel habitat. As streambanks stabilize they may become re-vegetated, although often by early seral or upland species (undesirable). Collectively, these two measures describe how streams are adjusting to riparian and upland impacts. Streambank stability and width to depth ratios would also be expected to change over time as riparian and upland conditions improve or degrade.

Width to depth ratios are a critical attribute of Properly Functioning systems because they enable the channel to maintain its pattern, profile, and dimensions. Wider, shallower streams heat up faster and have less pool habitat than narrower, deeper streams (Hawkins et al. 1998). Stable streambanks are also desirable because they hold riparian vegetation that traps and filters sediment and can provide undercut banks for fish cover.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: Alternative 1 would promote the most rapid recovery in reaches that are currently Functioning-at-Risk and Non-functioning (see Table 23). Streams that are already Properly Functioning (Keeton, Fry, Mac, Fort, and portions of Crazy Creek) would continue to provide quality habitat for fish and other aquatic organisms and, in some cases, move closer to full potential where riparian vegetation and streambanks are still slightly impaired (i.e., where vegetation expansion is limited due to high utilization and streambanks exhibit 10 - 20% instability). A complete summary of effects under this alternative, by reach, is provided in Table 27.

Under this alternative, direct livestock impacts to redband and steelhead trout populations would not occur.

This alternative would increase the amount of riparian vegetation retained at the end of the growing season and reduce streambank alteration. Any consumption of vegetation and use along streambanks by domestic livestock will consequently increase alteration and slow plant growth below levels without grazing. Vigorous growth and expansion of riparian vegetation is needed to reduce width to depth ratios. A reduction in streambank alteration is needed to improve overall bank stability.

The elimination of livestock grazing would improve Functioning-at-Risk streams faster than Non-functioning streams (see Table 23) by allowing natural processes such as floods and droughts to restructure channel morphology over time. The time period for at least partial recovery of some functional habitat components could be expected within a decade for streams that are already near Functioning (see Table 23). All streams that are Non-functioning (see Table 23) would likely take several decades to recover and a 0.25-mile reach in upper Happy Camp Creek would also require active restoration. Perennial streams should also recover faster than intermittent ones because they can support riparian vegetation that is needed to decrease width to depth ratios and improve bank stability. Figure 6 illustrates fish distribution and is roughly analogous to perennial streamflow.

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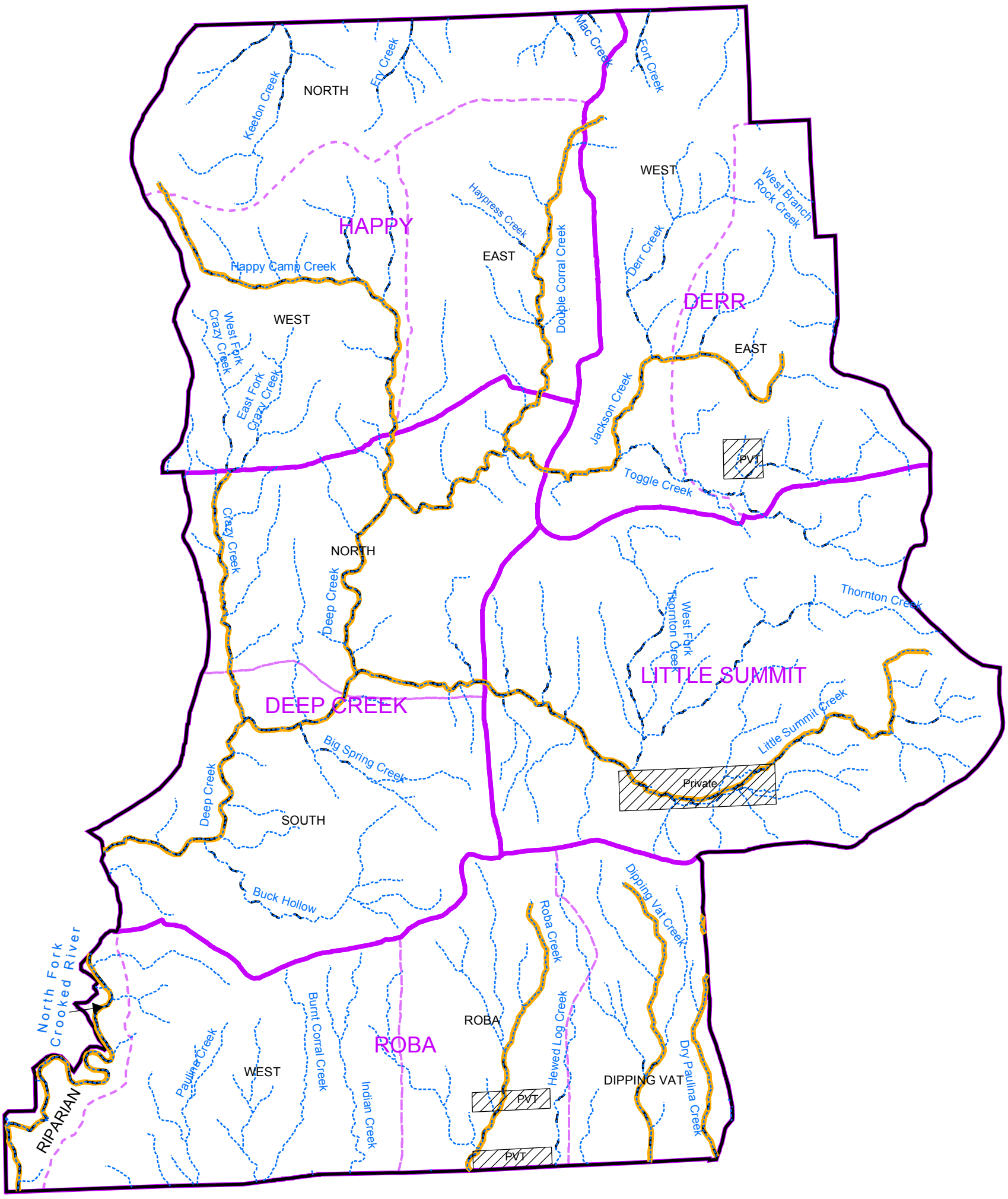

Figure 6 - Stream Attributes of the Westside Allotment Analysis Project, Paulina Ranger District, Crook and Wheeler Counties, Oregon

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There are also a variety of geomorphic, hydrologic, and vegetative factors that would influence recovery time periods in any given stream (Rosgen 2001). In Toggle Meadow, lower Haypress and Thornton Creeks, channel incision and headcutting has occurred and many decades may be needed to recover these systems. Here, ecological thresholds have been exceeded and the channel is completely disconnected from its floodplain (visible through vertical cutbanks) the elimination of grazing may initiate recovery but not appreciably shorten the overall recovery time (Rosgen 2001).

The elimination of livestock grazing would improve width to depth ratios and bank stability most rapidly in reaches where vegetation is the limiting factor in riparian function (see Riparian and Upland Vegetation—Existing Conditions section). Some stream types (specifically D-, F- and G-) would not initially recover any faster under this alternative than if livestock remained (Table 27). These reaches must first undergo hydrologic stabilization that operates irrespective of livestock grazing (see Table 16, Fisheries BE for some succession scenarios) (Rosgen 1996; Bengeyfield and Svoboda 1998; Lockwood and Lockwood 1993; Van Haveren and Jackson 1987; Harvey and Watson 1986). Once they reestablish appropriate sinuosity patterns and gradient and sediment balance, then vegetation would exert a greater influence on channel dimensions. D-, F-, and G-type streams would continue to decline under this alternative in the <15 year time period.

For the reasons described above, this alternative would meet PACFISH/INFISH guidelines and achieve Riparian Management Objectives. Cumulative effects outside the scope of this action, however, may continue to prevent full-attainment of this requirement.

Cumulative Effects: There would be no adverse cumulative effects to Proposed, Endangered, Threatened, and Sensitive (PETS) aquatic species and their habitats from implementing Alternative 1 and rapid (i.e., three to five years) positive effects would be expected in reaches that are Functioning-at-Risk but near Functioning (see Table 23, Appendix C). The cumulative effects from implementing Alternative 1 would be most pronounced in streams where other projects are treating riparian vegetation, improving bank stability, and stabilizing riparian soils. Browsing of riparian shrubs, particularly in the Roba and (North Pasture) Happy Allotments, would still remain high due to large ungulate populations here. As a result of its Non-functioning condition and heavy elk browsing, shrubs in the Roba Allotment would be expected to recover slowest under this alternative. Trampling of redds and juvenile fish would, however, still potentially occur due to deer and elk.

Several (recent) past projects have slightly improved aquatic habitat conditions within the Deep Creek Watershed. Headcut stabilizations in Derr, Toggle, and Happy Camp Creeks have helped to reduce soil loss and improve (or does not further reduce) floodplain connectivity. Replacements of undersized culverts in Buck Hollow, Happy Camp, and Little Summit Creeks have improved fish passage, decreased downstream bank erosion and reduced upstream aggradation in these reaches. In addition, a number of riparian planting efforts in Little Summit, Toggle, and Dipping Vat Creeks has slightly decreased width to depth ratios, improved bank stability, and helped to filter sediment runoff. Artificial large woody debris placement activities that occurred in Jackson, Happy Camp, Deep, and Buck Hollow Creeks would be unaffected by this alternative. The placement of wood has helped to trap sediments, create pool habitat, decrease width to depth ratios, establish riparian vegetation, and improve connectivity with floodplains.

Both large (i.e., several acres or more) and small (<1 acre) spring and riparian exclosures exist within every allotment (Table 25). Many of these have fallen into disrepair and are no longer effective at excluding livestock. In many instances, where protection was offered for several years or more, riparian vegetation has flourished and stream channel habitat has improved. Implementation of this alternative would preclude the maintenance of these exclosures and obviate the need for new ones. Ungulate use would continue in all these areas, except where wildlife exclosure fences still exist.

Table 25: Summary of known past and present livestock exclosures, by stream, within the Westside Allotments Project Area.

Stream Name	Number	Allotment	Total Acreage	Exclosure Type(s)
Big Spring	3	Deep	39	Spring protection, campground, aspen protection
Buck Hollow	1	Deep	Unknown	Aspen protection
Cabbage	1	Happy	Unknown	Reservoir enclosure
Chamberlin	1	Derr	Unknown	Spring protection
Deep	1	Deep	0.2	Spring protection
Derr	1	Derr	Unknown	Riparian protection
Dipping Vat	2	Roba	2.08	Reservoir enclosure, spring protection
Happy Camp	4	Happy	10.6+	Spring protection, aspen protection
Keeton	3	Happy	.05+	Aspen protection, sensitive plants, spring protection
Little Summit	14	Little Summit	18.45+	Riparian protection, aspen protection, campground
Mac	1	Happy	Unknown	Campground
N. Fork Crooked R.	2	Roba	~1000.2	Riparian pasture, spring protection
Paulina	1	Roba	3.7	Aspen protection
Roba	1	Roba	Unknown	Aspen protection
Thornton	1	Little Summit	Unknown	Aspen protection
Toggle	2	Derr	Unknown	Riparian protection
Upper Crazy	1	Deep	489	Riparian protection

W. Fork Crazy	1	Happy	0.9	Unknown
W. Fork Thornton	2	Little Summit	Unknown	Aspen protection, sensitive plants

No measurable adverse effects are occurring to stream channel habitat from the Summit Timber Sale or from the Deep Salvage Sale (USDA 2004a). Several additional timber sales (including Fry, Watson, Fryton, Rainier, and Barn) have occurred in Keeton, Fry, Mac and Fort Creeks. While these are not believed to be causing measurable adverse direct effects to width to depth ratios or bank stability, there have been indirect effects. Pre-1994 (prior to implementation of Eastside Screens) timber harvest within riparian areas (including upland seeps and springs) opened the canopy and considerable hardwood shrub growth occurred (e.g., Mac and Fort Creeks). While willows and alders have improved stream channel stability and increased stream shading, riparian harvest also increased forage production and led to greater utilization by livestock (visual observations). In some cases, slash and logs that were not removed during logging operations have prevented stream access by livestock and ungulates. This allowed shrubs to grow vigorously and has increased overall bank stability, however, this served to displace hoof shear and compaction impacts onto streambanks without large wood and concentrated streambank alteration. The vigor of existing riparian hardwoods and recruitment of seedlings within previously logged riparian areas would be expected to increase under this alternative. This alternative would decrease width to depth ratios and increase overall bank stability within previously harvested areas.

Prescribed burning associated with the Summit, Fryton, Rainier, and Barn Timber Sales occurred outside of riparian areas and has produced mixed results for stream habitat. In isolated locations, backing fire may have consumed some large woody debris, however, it also had the positive effect of reducing the extent of conifer encroachment in riparian areas. Fire suppression, on the other hand, has contributed to conifer growth well outside of natural ranges of variability. Jackson, Derr, and Happy Camp Creeks are particularly dense and have less riparian vegetation. Conifer encroachment would not change under this alternative since livestock do not find these tree species palatable.

Pre-commercial thinning has occurred within riparian areas (RHCA'a under PACFISH/INFISH standards) in a number of streams within the Westside Allotments Project Area. Within the last ten years, this activity occurred in the following Creeks: Little Summit (4254 LP Timber Sale, Blue Bell TS, Deep Vegetation, Summit TS, Wilson TS), Mac (Barn TS, Fryton TS), Fort (Barn TS), Thornton (Deep Vegetation, Jackpine TS, Summit TS), W. Fk. Thornton (Jackpine TS, Summit TS), Jackson (Deep Vegetation), Dry Paulina (Dippy Beaver TS), Keeton (Fryton TS), Fry (Fryton TS), Happy Camp (Happy Camp Aspen), Big Springs (Summit TS), Buck Hollow (Summit TS). This may have increased water yields in all cases by reducing conifer encroachment and increased the vigor of remaining shade-producing trees. The cessation of livestock grazing would have no cumulative effect to overstory tree composition or density in riparian areas.

Dispersed recreation, particularly in the Deep Creek Watershed continues to impact aquatic resources, albeit on a small scale. Many dispersed sites exist along Deep Creek and its tributaries which contribute to riparian vegetation loss, soil compaction, and streambank

erosion. The Deep Creek Vegetation Management Project (2004a) will close and rehabilitate six of these sites, however, others will continue to affect short reaches until they too are addressed.

Two forthcoming projects within the Deep Creek Watershed have the potential to create beneficial effects to stream and riparian habitats. The Deep Creek Vegetation Management and Deep Creek Watershed Restoration Projects (NEPA completed in 2004 for both) will help to move vegetation, channel, streambank, riparian, and floodplain conditions in these systems in an upward direction. The former project will conduct vegetation treatments designed to mimic conditions that are closer to the historic range of variability. The latter project will carry out active watershed improvements to restore aquatic habitats by reconstructing degraded channels, closing roads, repairing headcuts, stabilizing streambanks, replacing culverts, and artificially placing large woody debris. Both projects would improve width to depth ratios and increase bank stability through a variety of treatments (see USDA 2004a, 2004b for details).

Currently, there are substantial and on-going impacts on private lands in all streams that flow off-Forest, as well as lands administered by the BLM along the North Fork Crooked River. Activities include livestock grazing, timber harvest, water withdrawal/irrigation, and road-building. While the extent of these impacts are not known, it is assumed that the elimination of livestock grazing on the Westside Allotments could improve downstream habitat conditions on these private lands by reducing sedimentation and decreasing the temperature of water delivered. On private lands and lands administered by the BLM, width to depth ratios may decrease and bank stability may increase slightly from improvements within the Westside Allotments Project Area, however, these downstream reaches are more responsive to land management practices in the immediate area than upstream cumulative effects. It seems more likely, however, that cessation of livestock grazing would affect beneficial changes in water quality on private lands (see the Water Quality Section).

Livestock trespass from adjacent private lands and the Lookout Mountain Ranger District would continue to limit the extent of vegetative recovery. These occurrences may affect the North Fork Crooked River and streams of the Roba and Happy (North Pasture) Allotments due to their proximity to private lands. It is uncertain how much vegetation utilization and streambank trampling would still occur if trespass continued in the future.

Alternative 2 – Proposed Action

Alternative 2 would promote stream channel recovery in all allotments but these rates would be different from one another. Streams that are now Properly Functioning would continue to be so, Functioning-at-Risk streams would improve, and Non-functioning reaches would slowly improve where they are not geomorphically limited. A summary of effects under this alternative can be found in Table 27. Integral to this determination is the adaptive management component which includes annual changes in standards based on monitoring information. This monitoring would provide data to more precisely implement standards, determine existing condition, guide administrative decisions, and provide information about site-specific and reach-scale trends. Inadequate implementation of the adaptive management process would produce a commensurate reduction in its effectiveness to recover riparian areas.

Project design criteria for steelhead trout listed in the current version of the Programmatic Biological Assessment (USDA 2004c) would apply under this alternative, including the specific mitigations for livestock grazing. Numerical criteria and timing for grazing activities would tier to the more restrictive standard in any given year.

Direct and Indirect Effects: Alternative 2 would enable geomorphic recovery in reaches that are currently Functioning-at-Risk and some that are Non-functioning (see Table 23, Appendix C, page 226). Keeton, Fry, Mac, and Fort Creeks, as well as a portion of Happy Camp Creek, are already Properly Functioning and would continue to provide quality habitat for fish and aquatic organisms. In some cases where riparian vegetation and streambanks are still slightly impaired (i.e., where vegetation expansion is limited due to higher utilization and streambanks exhibit 10 - 20% instability), these isolated segments may yet move closer to full potential. A complete summary of effects under this alternative, by reach, is provided in Table 27.

The direct effects of livestock grazing on fish populations are primarily limited to the trampling of redds when livestock are present during spawning seasons. Steelhead and redband trout are spring spawners (February – May, depending on flow regime, elevation and water temperature) with fry emerging several weeks to months afterward (also temperature dependent) (Thurow 1997). When livestock are present during early life stages there exists a greater opportunity to trample or displace large quantities of concentrated embryos, alevin and fry due to their limited ability to disperse.

Grazing does not typically commence on any of the Westside Allotments until May or later (after July 15 in North Pasture/Happy and West Pasture/Derr Allotments). Streams in the Roba Allotment are principally lower elevation, south-facing, receive more direct solar radiation, and exhibit an earlier hydrograph peak than any other allotment. Therefore, embryo, alevin and fry development in Roba, Hewed Log, Dipping Vat, and Dry Paulina Creeks probably occurs before or shortly after livestock enter the allotment; however, some level of impact cannot be ruled out here. Deep, Derr, Little Summit, and all of the Happy Pastures are more certainly temporally separated from direct impacts in this manner since livestock do not usually enter here until mid-June or later. This substantially limits the potential for lethal and sub-lethal effects in all but the Roba Allotment. Adult fish are more mobile and therefore able to escape trampling by livestock. In late-season pools where fish remain isolated, however, there is a potential for mortality when livestock 'key in' on these water sources. This situation would be more likely in Roba, Hewed Log, Dipping Vat, Dry Paulina, Buck Hollow, Thornton, and Toggle Creeks.

Direct effects to aquatic habitat may include the consumption of riparian vegetation and trampling of streambanks. Riparian vegetation would be expected to improve under this alternative because of reduced utilization. The detailed effects to riparian [and upland] vegetation are discussed in the Upland and Riparian Vegetation section of this document. Streambank stability would also be expected to improve under this alternative but would remain low in water gaps and other areas of concentrated use, particularly where early seral vegetation exists, as well as in incised channels (e.g., Toggle Meadow, Haypress and Thornton Creeks). The detailed effects to riparian and upland soils are discussed under Upland and Riparian Soils section of this document. This alternative would allow up to 40% utilization in some riparian areas (as long as stubble height thresholds are not

exceeded) and would accelerate the rate of plant growth by leaving more vegetation each year for expansion.

Direct effects to stream channel habitat under this alternative are expected to vary by stream channel type (Table 26). The Deep Creek drainage contains most of the reaches with Rosgen C- and E- stream types, particularly in the upper two-thirds of the watershed. These reaches are lower gradient, generally provide the highest quality spawning and rearing habitat for redband trout, and are most susceptible to livestock impacts. Approximately 41% of these reaches have since been converted to D, G, and F- stream types (see Table 26) and now provide much lower quality fish habitat than existed historically (USFS 2004a). Width to depth ratios are now much higher in these reaches and bank stability is generally poor.

The rate of recovery of width to depth ratios and bank stability in D-, G-, and F- stream types under this alternative would be within 5-15 years (see Table 26). These channels must undergo geomorphic transitions that may take up to several decades to recover (Rosgen 1996; Bengeyfield and Svoboda 1998; Lockwood and Lockwood 1993; Van Haveren and Jackson 1987; Harvey and Watson 1986). Until channel stability is achieved at a new, lowered elevation, these incised streams will continue to exhibit high width to depth ratios and instability. Livestock grazing would not significantly affect recovery of the pattern, dimension, and profile in these reaches because riparian vegetation cannot be sustained until streambanks stabilize, stream channels reconnect to floodplains, and higher water tables return.

The remaining C- and E-type reaches (Table 26) are particularly vulnerable to excessive livestock grazing but would slowly improve under this alternative as riparian vegetation improves. Extended drought would considerably slow the improvement of any Functioning-at-Risk or Non-functioning stream.

A- and B- stream types are steeper and occur mostly in the North Pasture/Happy Allotment, West Pasture/Derr, and in the lower third of the Deep Creek Watershed (Table 26). Geologic controls (i.e., confined by narrow valleys) in A- and B- stream types often preclude excessive bank instability, however, high width to depth ratios exist in B-channels (above those expected for this stream type). A-type reaches in upper Happy Camp and Roba Creeks exhibit high bank instability and would still not recover quickly under this alternative because riparian vegetation is not a major controlling influence. Width to depth ratios are slightly above expected values within A- stream reaches of Little Summit, Happy Camp, and Roba, however, narrow valleys generally prevent excessive widening.

Vegetation plays a much more significant role in maintaining channel structure and dimension in B- stream types. Again, width to depth ratios and bank stability in Functioning-at-Risk and Non-functioning streams (Table 26) would slowly recover as riparian vegetation expands. B-type Functioning-at-Risk reaches in lower Crazy, Deep, Dipping Vat, Double Corral, lower Happy Camp, Hewed Log, Indian, Jackson, and Little Summit Creeks would improve more quickly because some of the riparian species are already present. Non-functioning B- stream types in Dry Paulina and Roba would be slower to recover their width to depth ratios and streambanks because of their degraded nature. Keeton, Fry, Mac, and Fort Creeks would display slightly more vigorous riparian vegetation under Alternative 2.

Among all stream types, width to depth ratios and streambank stability would not improve as rapidly in intermittent and ephemeral reaches because vegetation is slower to establish and grow here. Perennial streams that retain high soil moisture in the banks and floodplain are more capable of supporting vigorous riparian vegetation. Streambanks that are dry and hardened by mid-summer are more resilient to hoof shear and sloughing, however, these reaches would not show reduced width to depth ratios until riparian vegetation becomes established. Therefore, site-specific recovery is also limited by factors outside the scope of this action.

Table 26: Susceptibility to livestock grazing and recovery potential in streams of the Westside Allotments Project Area (adapted from Rosgen 1996).

Stream Type	Westside Streams of this Type*	Sensitivity to Disturbance by Livestock Grazing	Ecological Recovery Potential
A	Little Summit, Crazy, Keeton, Fry, Fort, Mac, Happy Camp, Roba, Big Spring	Low	Low
B	Dry Paulina, Dipping Vat, Hewed Log, Little Summit, Deep, Keeton, Fry, Fort, Mac, Jackson, Crazy, Happy Camp, Double Corral, Roba, Indian, Buck Hollow, Big Spring	Low	High
C	Dipping Vat, Little Summit, Deep, Happy Camp, Jackson, Double Corral, Toggle, Thornton, Chamberlin, Roba, Burnt Corral, Indian, North Fork Crooked River	High	High
D	Deep, Little Summit, Indian	High	Low
E	Dipping Vat, Dry Paulina, Thornton, Crazy, Toggle, Jackson, Happy Camp, Double Corral, Derr, Big Spring, Little Summit	High	High
F	Haypress, Thornton, Toggle, Roba	Variable, depending on substrate type	Moderate
G	Haypress, Thornton, Toggle, Little Summit, Happy Camp, Roba	Variable, depending on substrate type	Low

* Major Rosgen channel types for each stream have been determined in the field during stream surveys but short reaches of different stream types are probable. Haypress, Big Spring, Buck Hollow and Derr Creeks have never been surveyed but information comes from visual observations.

Alternative 2 would rest the Roba Allotment for the first three years [following implementation] and then only the Riparian pasture would thereafter have short duration,

early season grazing. C- stream types in Dipping Vat, Indian, Roba and Burnt Corral Creeks respond favorably to early season grazing and would be expected to recover more quickly under this alternative (Rosgen 1996). E-type reaches in Dipping Vat and Dry Paulina Creeks would not benefit from early season grazing where and when soils are still saturated and, thus, be more susceptible to streambank alteration (ibid.). Although Alternative 2 requires that overall soils be dry prior to livestock turn-out, E-reaches are generally wet through the grazing season. Other stream types within the Roba Allotment would be less directly affected (positively or negatively) by this grazing strategy. Across all stream types in this allotment, any recovery of width to depth ratios and bank stability would be fastest in the first three years and then more slowly thereafter.

In the Riparian Pasture of the Roba Allotment, the North Fork Crooked River is a C-type channel and would continue to recover with an early season, short duration grazing strategy, and be further aided by rest every other year. A 2005 report (USDA 2005) concluded that it is currently Functioning-at-Risk with an upward trend. Improvement of width to depth ratios would occur as riparian shrubs expand and help to retain large woody debris. Streambanks are generally stable in this reach and width-to-depth ratios are very high. Continued slow improvement of the North Fork Crooked River would occur under Alternative 2 and through additional changes in management that are outside the scope of this analysis. Until large woody debris is established in the channel and along the streambanks, hardwood shrub growth is expected to increase only slightly in the next 15 years.

Numerous indirect effects to stream channel habitat are possible (see Belsky et. al 1999 for a general review) and may include changes in pool frequency (e.g., Myers and Swanson 1994), changes to water quality (see Water Quality Section), altered connectivity with floodplains and groundwater (e.g., Kovalchik and Elmore 1992), and changes to instream cover (e.g., Overton et al. 1994). Indirect effects of Alternative 2 would include an increase in pool frequencies, an improvement in water quality, slightly increased flow connectivity with soils, and an increase in instream cover (i.e., large woody debris, undercut banks) over the long term of 5-15 years.

As width to depth ratios and bank instability decreases from improvements in riparian vegetation and reduced streambank alteration, vertical channel scour would increase during high flows. Reaches with substrates of silt, sand, gravel, and small cobbles would see the greatest increases in pool frequencies and residual pool depths. Reaches with large cobbles, boulder and bedrock substrates would change little since they are so resistant to vertical scour. Larger substrates may only rearrange during the highest flow events, if ever, and these streams would remain more resistant than those with mobile sediments.

Improved connectivity with floodplains and groundwater tables would occur where riparian vegetation develops and expands. Sedges, rushes, willows, and alder contain dense root masses, which retain soil moisture longer through the year. As vegetation expands further, floodplains develop, particularly in lower gradient C- and E- stream types (Table 26). F- and G- type reaches in Haypress, Thornton, Toggle, Little Summit, Happy Camp and Roba Creeks are continuing to incise or expand their beltwidth and would be slower to recover connectivity with floodplains and groundwater (Rosgen 1996; Bengeyfield and Svoboda 1998; Lockwood and Lockwood 1993; Van Haveren and Jackson 1987; Harvey and Watson 1986). F-, G-, and D-type streams would continue to decline under this alternative

in the <15 year time period as the recovery of stream channel function is a hydrologic process and is expected to take longer. See the sections on Impacts to Riparian and Upland Vegetation and Impacts to Riparian and Upland Soils for further discussion of the effects of riparian vegetation and soils.

Under Alternative 2, the rate of recovery of width to depth ratios and bank stability would lead to attainment of Riparian Management Objectives within a 5-15 year timeframe (see Effects Summary for timeframes). Monitoring proposed under Alternative 2 would further quantify this rate of recovery by comparing similar stream types in control reaches.

Cumulative Effects: All of the past, present, and reasonably foreseeable activities related to cumulative effects described under Alternative 1 are pertinent here as well, though their effects would be different. There would be no adverse cumulative effects to PETS aquatic species and their habitats from implementing Alternative 2. The positive cumulative effects of implementing Alternative 2 would be most pronounced in streams where other projects treat riparian vegetation, improve bank stability, and stabilize riparian soils. Browsing of riparian shrubs, particularly in the Roba and (North Pasture) Happy Allotments, would still remain high here due to large ungulate populations.

Instream improvements, such as headcut repairs, culvert replacements, and large woody debris additions, would be virtually unaffected by implementation of this alternative. Only those activities that rely upon or treat riparian vegetation would be affected by Alternative 2. For example, riparian plantings in Little Summit, Toggle, and Dipping Vat Creeks would possibly be browsed and therefore be less vigorous. This would effectively slow the rate at which width to depth ratios would decrease. Similarly, where the Fry, Watson, Fryton, Rainier, and Barn Timber Sale units entered riparian areas, the riparian shrubs that have become established may be browsed by livestock if implementation monitoring is not prompt enough to detect use in these areas. Any utilization may reduce their vigor and effectiveness at recovering width to depth ratios and protecting streambanks from livestock impacts.

The extent of conifer encroachment due to fire suppression would not change under this alternative since livestock do not often find these species palatable. In locations where prescribed fire backs into riparian areas, grasses and forbs are afterwards likely to become established. This may further concentrate use by livestock in riparian areas and slow recovery of width to depth ratios. Imminent prescribed fire activities within the Westside Allotments Project Area are limited to the Fort Creek area at this time (Fryton-Barn EA, 1998). This stream has ample riparian shrub cover and could reasonably filter any additional sediment contributed through burning. Future burning will also occur with activity-generated and natural fuels treatments in the Deep Creek watershed (USDA 2004a). Of the 14,120 acres of fuels reduction planned, 612 acres are burn blocks within RHCAs, although no direct ignition would occur here. In both Fort and Deep Creeks, backing fire has the potential to create additional browse and make riparian areas more appealing to domestic livestock and ungulates. Therefore, the potential exists for slowing vegetative recovery, and ultimately width to depth ratios and streambank stability.

In instances where they are actively maintained, livestock exclosures would continue to be effective at promoting vegetative recovery (Table 25). Historical riparian and spring exclosures that are no longer maintained are allowing livestock use within them and future vegetative recovery would be similar to that outside the fence. Outside of exclosures where

plants are well established and shrubs have grown above browse height, these sites would be less vulnerable to browsing and alteration. Riparian vegetation growth may be slowed if plants are still able to be browsed and livestock are not well-distributed throughout the pasture. Off-channel water developments for livestock would need to be maintained under this alternative if they are to reduce pressure on riparian areas. Continued livestock trespass from adjacent private lands and the Lookout Mountain Ranger District would effectively shorten the grazing season for permittees under Alternative 2.

Dispersed recreation, particularly in the Deep Creek Watershed, continues to impact aquatic resources, albeit on a small scale. Many dispersed sites exist along Deep Creek and its tributaries, which contribute to riparian vegetation loss, soil compaction, and streambank erosion. These sites will continue to negatively affect short reaches until they are closed and rehabilitated, and may concentrate livestock if they promote the growth of additional forage. Six of these sites will be treated as part of the Deep Vegetation Management Project (USDA 2004a).

The Deep Creek Watershed Restoration Project will be implemented beginning in 2005 and continue for many years. The Deep Creek Vegetation Management Project is expected to begin within one year. Both of these projects will conduct a variety of treatments to improve riparian and stream channel conditions. As these activities establish and expand riparian vegetation, most of these sites would remain available to livestock. There are 28 miles of riparian planting proposed (USDA 2004a), most of which would not be protected with livestock exclosures and thus be susceptible to browsing pressure. There are four exclosures (Jackson, Toggle, West Fork Thornton, and Big Springs Creeks) totaling 226 acres that would afford protection in these reaches, as would the addition of a riparian pasture to lower Deep Creek (USDA 2004b). Although this alternative would move livestock when shrub browsing is detected and trespass into exclosures would occur only accidentally, any amount of non-detection of these actions would slow the recovery of width to depth ratios. In reaches where static or downward trends exist, planting and site protection would be expected to at least initiate the recovery of width to depth ratios. Many of the activities in the Deep Restoration Project would also improve bank stability and would be vulnerable to trampling if not protected. This too may slow the rate at which bank stability increases in treated reaches.

Any current or future activities off-Forest that relies on water or riparian function may be affected slightly through implementation of Alternative 2. On private and BLM lands, width to depth ratios may decrease and bank stability may increase slightly from improvements within the Westside Allotments Project Area, however, these downstream reaches are more susceptible to land management practices at that location and would be more affected by changes in water quality.

Alternative 3 – Current Allotment Management

As it is currently implemented, Alternative 3 would promote slow recovery in all allotments and, in some cases, not move individual reaches toward attainment of RMO's within a 5-15 year timeline (see Table 27 for a summary, by reach). Integral to this determination is the belief that current utilization is too high for measurable vegetative recovery within this timeframe and that incised reaches must undergo hydrologic recovery, which is expected to take many decades (see Effects Summary).

Project design criteria for steelhead trout listed in the current version of the Programmatic Biological Assessment (USDA 2004c) would apply under this alternative, including the specific mitigations for livestock grazing. Numerical criteria and timing for grazing activities would tier to the more restrictive standard in any given year (i.e., Programmatic criteria or Alternative 3 standards).

Direct and Indirect Effects: Alternative 3 would produce slow recovery of width to depth ratios and bank stability in reaches that are currently Functioning-at-Risk (Table 23). Movement toward desired future conditions in the downcut reaches of Haypress, Thornton and Toggle, as well as Non-functioning reaches in Happy Camp and Roba, may continue to be retarded because vegetation management alone will not fix many of these problems. Streams that are already Properly Functioning (Table 23) would continue to provide quality habitat for fish and other aquatic organisms since riparian vegetation is generally lush and adequately protects streambanks from erosion. A complete summary of effects under this alternative, by reach, is provided in Table 27.

The mere presence of livestock means that there is the possibility of trampling mortality to egg embryos, alevin and fry. PACFISH timing restrictions would not change under this alternative so redds and juvenile steelhead in the North Pasture Happy and West Pasture Derr Allotments (Keeton, Fry, Mac, Fort, Derr, Jackson, and Toggle Creeks) would be temporally protected from direct livestock damage. Redband trout redds in streams of the Deep, Derr, Little Summit, and Happy Allotments (Figure 8) would not likely be subject to trampling since turn-out occurs after egg hatching. Fish-bearing streams of the Roba Allotment (Roba, Hewed Log, Dipping Vat, and Dry Paulina Creeks) may incur some redd trampling and mortality to juvenile life stages due to livestock interactions early in the grazing season (May and June).

Direct effects to aquatic habitat include the consumption of riparian vegetation and trampling of streambanks. The growth of riparian vegetation and movement toward desired future conditions would be slow or non-occurring under this alternative; the detailed effects to vegetation are discussed under the Impact to Riparian and Upland Vegetation Section. The improvement in streambank stability toward meeting the desired future condition would also be slow under this alternative; the detailed effects to riparian soils are discussed under Impacts to Riparian and Upland Soils Section.

The ecological recovery potential of Functioning-at-Risk and Non-functioning reaches, by stream type, is described in Table 26. The rate at which these reaches move toward regaining appropriate width to depth ratios and natural levels of streambank instability would be very slow under Alternative 3. This would allow up to 55% utilization in riparian areas (as long as stubble height thresholds are not exceeded), which would certainly slow the growth of existing riparian vegetation and delay stream channel habitat improvement.

In F-type reaches of Thornton and Roba Creeks, the time to recovery would be even longer due to hydrologic limitations and succession scenarios (Table 16, Fisheries Biological Evaluation). Expansion of riparian vegetation, or even the exclusion of livestock (Alternative 1), would not significantly shorten recovery time in Non-functioning F-type reaches (Haypress, lower Thornton, Toggle, and Roba Creeks) that have downcut. These reaches will continue to degrade until they reestablish a natural pattern (i.e., beltwidth) at a new, lowered elevation (Rosgen 1996; Bengeyfield and Svoboda 1998; Lockwood and Lockwood 1993). Some amount of bank disturbance (i.e., livestock alteration) may

actually help reaches with vertical cutbanks reduce their bank angle and hasten floodplain development.

A- and B- stream types (Table 26) would be least sensitive to livestock disturbance since vegetation is not as important in controlling width to depth ratios as geomorphic controls. Width to depth ratios would remain the same as existing conditions in these reaches because they are largely unaffected by livestock grazing. Currently, streambank stability is within PACFISH standards for all A- and B- stream types of the North Pasture/Happy Allotment (Table 22, Appendix C) and would be expected to remain so under this alternative.

Functioning-at-risk and Non-functioning C- and E- stream reaches (Table 26, and Table 23, Appendix C, page 226) would not improve under Alternative 3. Wet E-type reaches are common in meadows such as Toggle, Haypress, Timothy, Derr, and Dicer. Livestock often concentrate here and streambanks are particularly susceptible to damage when soils are saturated (Rosgen 1996). C-type channels (Table 26) are often dominated by willow and alder communities, which are critical for maintaining channel dimensions. Any significant mid- or late-season browsing would continue to produce deleterious results for streambanks. An inadequate distribution of animals would increase width to depth ratios and bank instability in any reach where use becomes concentrated.

C- stream types in Dipping Vat, Indian, Roba and Burnt Corral Creeks would be expected to recover more quickly than E-types under this alternative (Rosgen 1996). E -type reaches in Dipping Vat and Dry Paulina would not benefit if early season grazing occurs on soils that are still saturated and are more susceptible to streambank alteration (ibid.). Riparian fencing or adjusted timing in Dipping Vat and Dry Paulina Creeks would be necessary to mitigate this.

Under this alternative, the Riparian Pasture of the Roba Allotment would also be grazed in early season for <20 days. In this pasture, the North Fork Crooked River is a C-type channel and would continue to slowly recover with this type of grazing management (ibid.). A 2005 report (USDA 2005) concluded that this reach is Functioning-at-Risk with an upward trend. Improvement of width to depth ratios would occur as riparian shrubs expand and help to retain large woody debris. Large woody debris that effectively prevents livestock browsing of shrubs would further enhance hardwood growth. Bank instability in this reach is low and would not change under this alternative.

The rate of recovery of width to depth ratios and bank stability will meet Riparian Management Objectives over a time period not greater than 15 years. In some instances, streams that have crossed an ecological threshold may never fully recover in a timeframe relevant to management objectives.

Cumulative Effects: All of the past, present, and reasonably foreseeable activities related to cumulative effects described under Alternative 1 are pertinent here as well, though their effects would be different. The relative rates of recovery for each alternative are disclosed in Table 27. Recovery of width to depth ratios and bank stability in all stream types (Table 26) would be slow or not-occurring under Alternative 3 because utilization rates are higher. Consumption up to 55% would severely limit riparian vegetation recovery. The establishment of sedges, rushes, willows, alders, and other riparian dependent vegetation

would be slowest in the Non-functioning reaches of Roba, Dry Paulina, upper Happy Camp, lower Thornton, and lower Toggle Creeks (Table 23) and faster in Functioning-at-Risk reaches, such as lower Happy Camp, that are already near Functioning (Table 22, Appendix C). Properly Functioning reaches (Table 23) would remain such under this alternative unless future activities negatively affect riparian vegetation or increase riparian forage (thereby increasing the likelihood of browsing).

The Deep Creek Vegetation Management and Deep Creek Watershed Restoration Projects would improve these attributes throughout the watershed and have the biggest positive cumulative effect of any future activity. The latter project will initially conduct stream restoration activities in Jackson, Derr, Double Corral and upper Deep Creeks. Subsequent years will rotate activities to the Little Summit Creek subwatershed and then to the lower Deep Creek subwatershed.

Width to depth ratios and streambank stability would remain static or improve the slowest in the Roba Allotment. The complicating factors of fire, floods, drought and other natural variability, as well as annual variability in management, make quantitative spatial prediction of these cumulative effects extremely difficult. Browsing of riparian shrubs, particularly in the Roba and (North Pasture) Happy Allotments, would still remain high here due to large ungulate populations.

Alternative 3 would allow livestock to spend more time in a given area, including old timber harvest units, dispersed recreation sites, and in future prescribed burning areas of Deep Creek, thus increasing the likelihood of negative impacts to width to depth ratios and streambank stability. Prescribed fire activities in Fort Creek have the greatest potential to increase forage and sediment production, however, most fire should remain outside of riparian areas and existing vegetation should adequately filter sediments before reaching the stream channel. Continued livestock trespass from adjacent private lands and the Lookout Mountain RD would further slow the recovery and expansion of riparian vegetation under Alternative 3.

Summary: Implementation of Alternatives 1 and 2 would produce effects that are similar in trend, yet vary by degree. Alternative 3 was analyzed under the premise that future implementation would be similar to current implementation. Thus, Alternative 3 would slowly recover streams that are Functioning-at-Risk and Non-functioning reaches would remain static within a 15 year period. A complete summary of effects, by reach, is provided last in Table 27.

This determination is founded in the concept developed by Platts (1984) that livestock impacts to riparian areas and stream channels are directly related to the amount of time that cows spend in a riparian area and their stocking density. Simply put, if utilization levels are greater, the greater the risk that suppression of plant growth or damage to riparian areas would occur.

Expected time periods for recovery would vary by stream type and functional class. B-, C-, and E-stream types that are already near Functioning (i.e., width to depth ratios and bank stability only slightly above standards; see Table 22, Appendix C) would likely exhibit recovery within 3-5 years under Alternative 1, 5-15 years under Alternative 2, and >15 years for Alternative 3. Non-functioning B-, C-, and E-type reaches would also recover within 15 years under Alternative 1, but may take longer under Alternative 2, and longer still for Alternative 3. A- stream types are generally very resilient to livestock impacts and

their current impairment and recovery is probably not closely tied to vegetative improvement. D-, F- and G-types must continue to decline somewhat as they adjust their pattern, dimension, and profile to a new, lower elevation (Table 16, Fisheries Biological Evaluation) (Rosgen 1996). This would likely occur over a 15-30 year period under Alternative 1, 15-40 years for Alternative 2, and >40 years for Alternative 3. In all of these scenarios, once equilibrium is reached, proper vegetation (composition and extent) is necessary to maintain a stable sinuosity, dimension, and gradient. Importantly, however, timeframes for all Alternatives are contingent upon a spectrum of hydro-climatic conditions that includes both drought and flooding to re-achieve stability. Climatic extremes may slow or accelerate recovery in some streams and is dictated by a myriad of site-specific factors largely outside the scope of this analysis.

Under Alternative 2, the adaptive management strategy would obviate the need to prescribe duration or stocking density at any set-level, but rather, remove livestock when standards are reached each season. Monitoring data would be used to adjust annual thresholds for utilization, streambank alteration, and soil disturbance. Consistent implementation, appropriate monitoring sites, and prompt response to changing resource conditions would be critical components to success under Alternative 2. Despite difficulties with implementation, utilization standards under Alternative 3 are not believed to be conservative enough to recover riparian vegetation, streambanks, and stream channels in a reasonable time period (i.e., <10 years). Additional information regarding the effects of each Alternative can be found in the fisheries Biological Evaluation (Analysis File).

Selection of Alternative 1 would not meet the purpose of continuing livestock grazing as would Alternatives 2 and 3. Alternative 1 would meet the need to improve [aquatic] resource conditions most quickly among all Alternatives; Alternative 3 would not meet this need. The desired future condition of riparian vegetation, stream channels, streambanks, and water quality would be met most quickly under this Alternative 1, less quickly under Alternative 2, and most slowly or not at all under Alternative 3.

Table 27: Relative rates of stream channel habitat recovery for 0-15 year time period: Comparison by Alternative.

Stream	Stream Type	Functional Class	Alternative 1	Alternative 2	Alternative 3
Big Spring*	A, B, E	ND	↑	↑	↗
Buck Hollow*	B	ND	↑	↑	↗
Burnt Corral	C	FAR	↑	↑	↗
Chamberlin	C	FAR	↑	↑	↗
Crazy	A	FAR	↗	→	→
Crazy	B	PF	↗	→	→
Deep	C	FAR	↑	↑	↗
Deep	D	FAR	↘	↘	↘
Derr*	E	ND	↑	↑	↗

Dipping Vat	C	FAR	↑	↑	↗
Dipping Vat	E	FAR	↑	↘	↘
Double Corral	B	FAR	↗	↗	→
Double Corral	C	FAR	↑	↑	↗
Double Corral	E	FAR	↑	↑	↗
Dry Paulina	B	NF	↗	↗	→
Dry Paulina	E	NF	↗	↘	↘
E. Fork Crazy	ND	PF	↗	→	→
W. Fork Crazy	ND	FAR	↑	↑	↗
Fort	A	PF	→	→	→
Fort	B	PF	↗	→	→
Fry	A	PF	→	→	→
Fry	B	PF	↗	→	→
Happy Camp	A	FAR	↗	→	→
Happy Camp	B	FAR	↗	↗	→
Happy Camp	C	FAR	↑	↑	↗
Happy Camp	E	FAR	↑	↑	↗
Happy Camp	G	NF	↘	↘	↘
Haypress*	F	ND	↘	↘	↘
Haypress*	G	ND	↘	↘	↘
Hewed Log	B	FAR	↗	↗	→
Indian	C	FAR	↑	↑	↗
Indian	D	FAR	↘	↘	↘
Jackson	B	FAR	↗	↗	→
Jackson	C	FAR	↑	↑	↗
Jackson	E	FAR	↑	↑	↗
Keeton	A	PF	→	→	→
Keeton	B	PF	↗	→	→
Little Summit	A	FAR	↗	→	→
Little Summit	B	FAR	↗	↗	→
Little Summit	C	FAR	↑	↑	↗

Little Summit	D	FAR	↘	↘	↘
Little Summit	E	FAR	↑	↑	↗
Little Summit	G	FAR	↘	↘	↘
Mac	A	PF	→	→	→
Mac	B	PF	↗	→	→
N. Fork Crooked R.	C	FAR	↑	↑	↗
Paulina*	ND	ND	UKN	UKN	UKN
Roba	A	NF	→	→	→
Roba	B	NF	↗	↗	→
Roba	C	NF	↗	↗	→
Roba	F	NF	↘	↘	↘
Roba	G	NF	↘	↘	↘
Thornton	C	FAR	↑	↑	↗
Thornton	E	FAR	↑	↑	↗
Thornton	F	NF	↘	↘	↘
Thornton	G	NF	↘	↘	↘
Toggle	C	FAR	↑	↑	↗
Toggle	E	FAR	↑	↑	↗
Toggle	F	NF	↘	↘	↘
Toggle	G	NF	↘	↘	↘
SUMMARY			**23↑, 18↗, 5→, 13↘**	**22↑, 8↗, 14→, 15↘**	**0↑, 22↗, 22→, 15↘**

* These projections are speculative since data was not available to determine functional class.
Symbols: ↑: Upward trend ↗: Slightly upward →: No change ↘: Slightly downward UKN: Unknown

Management Indicator Species (MIS)

Introduction

Primary cavity excavators, the pileated woodpecker, and the northern flicker are identified in the Forest Plan as Management Indicator species, and are representatives of species dependent upon dead wood (specifically snags) habitat. In the case of the pileated woodpecker, they are also an indicator of an old growth habitat condition characterized by dense, multi-structured stands with a dominant component of large trees. Snags, and the characteristics of diameter, decay class, and densities, are key indicators of habitat quality and viability for populations of primary cavity excavators. For the pileated woodpecker, old growth habitat is added to the indicators of habitat quality and viability for populations of this species. With the exception of the red-naped sapsucker and the downy and Lewis's

woodpeckers, other primary cavity excavators (including the pileated woodpecker) and the northern flicker are generally not affected by livestock grazing. Livestock grazing generally does not create snags or destroy them. With the red-naped sapsucker and the downy and Lewis's woodpeckers, livestock grazing effects upon hardwood habitats, primarily cottonwood and quaking aspen, can influence the amount of habitat that is available to these species, and thus their distribution and local populations viability. Livestock grazing has affected hardwood habitats, and those affects have been adverse to these species. Effects to these three species will be addressed here. Mid-Columbia River steelhead and redband trout are also Forest Management Indicator Species. Refer to pages 129-152 of this document for a discussion of these species.

Affected Environment

The red-naped sapsucker and the downy and Lewis's woodpeckers utilize some or all of hardwood species: cottonwood, aspen, willow, and alder. They utilize these trees for nesting, feeding, and roosting activities. Most individuals will excavate nest cavities in live trees, taking advantage of the tree's propensities for heart rot and other similar fungi that create ideal excavation conditions.

The red-naped sapsucker selects for aspen and cottonwood habitats as a primary habitat type, although the species will utilize mixed conifer forests (Marshall et al. 2003). Marshall et al. (2003) reports a strong preference towards aspen habitats in their review of the research. Marshall et al. (2003) also states a relatively stable population of red-naped sapsuckers in Oregon, but indicated a concern in northeastern Oregon over the continued decline in functioning aspen communities and the impact this loss of habitat would have on populations and distribution of these species.

The Lewis's woodpecker uses a variety of forest types including mature cottonwood forests for its nesting and roosting habitat needs (Marshall et al. 2003). The species is most common in the oak woodland/ponderosa pine habitats of the north eastern slopes of the Cascades east of Mt. Hood (ibid). The Lewis's woodpecker is primarily an aerial forager on insects, but also collects fruits from various plants and tree species (ibid.). The species was historically common throughout its range, including the Ochoco Mountains, but has declined or disappeared in most of its range (ibid.). Loss of riparian and hardwood habitats and competition with other species for limited resources are identified as possible reasons for the species' decline.

The downy woodpecker also selects for hardwood communities, or mixed hardwood/conifer forest communities as primary habitat types (Marshall et al. 2003). Marshall et al. (2003) notes a strong preference for aspen, cottonwood, alder and willow communities as desired habitat. They also note negative correlations between species densities in grazed hardwood communities when compared to un-grazed hardwood communities. Marshal et al. (2003) also notes that the species in Oregon appears to be stable or on a slight declining trend, but that replacement of hardwood habitats with conifers and the grazing in riparian habitats appear to pose the greatest risk for this species in eastern Oregon.

Hardwood communities in the project area were much more abundant historically than what is found today. A variety of historic activities, including historic grazing, timber harvest, loss of beaver, road building, fire suppression and climate change have reduced the

size and distribution of these habitats. Cottonwood habitats are primarily located along the lower reaches of Deep Creek, Jackson Creek, Crazy Creek, Little Summit Creek, Happy Camp Creek, Keeton Creek, Fry Creek, and other small unnamed tributaries along these reaches. Very little reproduction is apparent in most cottonwood stands; most trees are relatively large and decadent. Some middle sized trees are scattered in the project area. Aspen are widely scattered throughout most of the project area, usually associated with riparian areas, but may also be located in upland wet areas such as springs and seeps. Aspen habitats are generally small, usually less than an acre or two in size, with a few exceptions (Happy Camp Creek aspen stands). Individual stands tend to be over mature with very little reproduction occurring in the understory, unless protected by an exclosure. Willow and/or alder communities are spread throughout most of the perennially flowing streams in the project area. Stands are generally in poor condition, with mostly decadent stems or patches of dead remaining. Limited reproduction is occurring, and is generally heavily browsed by ungulates (USDA 1999). The Deep Creek Watershed Analysis identifies riparian shrub communities as native plant communities at risk of extirpation (ibid.). Past livestock grazing, loss of beaver through trapping, and the continued herbivory of wild ungulates and livestock are identified as culprits. Altered riparian function, effects of roads bisecting riparian areas, suppression of fire disturbances, and timber harvest are other factors that have affected the quality and condition of hardwood habitats in the project area.

It is estimated that more than 1,800 acres of potential habitat for riparian associated hardwood communities exists in the project area. This acreage is based upon approximately 74 miles of perennially flowing streams existing in the project area, with an estimated overall average riparian width of approximately 200 feet where hardwood communities could function with healthy riparian conditions. An additional 200-300 acres of upland seeps, springs and similar wet areas are also present for aspen habitats in the project area. Given assessments in the Deep Creek Watershed Analysis (USDA 1999) and field observations, it is estimated that less than one third of that area (<600 acres) has hardwoods present. Most of the hardwood habitat is not functioning as habitat for the cavity excavator species described above. It is suspected that the majority of the aspen habitats do not function as suitable habitat as well, mostly due to the small size of individual patches, lack of snag habitat or large trees, or overall degraded condition of those habitats (USDA 1999).

Habitat conditions for species dependent upon these plant communities are relatively poor, mostly from the standpoint of the reduced presence and distribution of these habitats. Large cottonwood and aspen trees are present in the project area. These trees, however, are old and mortality is common, further reducing the availability of nesting, foraging and roosting habitats. Changes in habitat conditions in riparian areas, as well as ungulate browsing, insects and disease, and possibly climatic changes, have worked to suppress the development and expansion of these habitats. The absence of beaver and their influence on riparian habitat function is also an important contributor to the decline of these habitats.

Population levels of the red-naped sapsucker and the downy and Lewis's woodpeckers in the project area are not surveyed for by the District. Breeding bird surveys (BBS) indicate likely presence, although none of the routes surveyed enter riparian habitat within the project area. Trends for the red-naped sapsucker and downy woodpecker fluctuate on nearby routes over the survey years in the 1990's. The Lewis's woodpecker was rarely

detected in nearby BBS routes. Sightings for each species is present on the Paulina Ranger District, but only the downy and Lewis's woodpecker are noted in the project area. The red-naped sapsucker is suspected in the project area as functioning habitat exists.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: Alternative 1 would not result in direct or indirect adverse effects to habitat for hardwood-dependent primary cavity excavators. The absence of livestock grazing would prevent livestock herbivory on cottonwood, aspen, alder, and willow in the project area. Herbivory from mule deer, Rocky Mountain elk, and antelope would continue, and would continue to effect development and expansion of these habitats. Cobb and Vavra (2003) noted that wild ungulate herbivory was still important and affected stand expansion and development, even with the exclusion of livestock. Aspen, in particular, may be most at risk of continued adverse herbivory effects, even in the absence of livestock. Riggs et al. (2000) noted similar interactions in the exclosures and studies they reviewed, and that in some cases, wild ungulate browsing may be more adverse to hardwoods and shrub diversity than livestock browsing. Willow, alder, and cottonwood habitats may respond more favorably to livestock removal. These habitats may receive less wild ungulate herbivory as a result of the indirect effects of road and traffic related disturbances keeping deer and elk utilization lower. It is assumed that the removal of livestock herbivory would reduce the amount of herbivory and allow for hardwoods to expand. Wild ungulate herbivory would influence the rate of habitat improvement and expansion.

Cottonwood, willow, and alder habitats, due to their growth and habit, would likely be more successful in expanding with the termination of livestock grazing. Aspen, however, may continue to be suppressed by wild ungulates, with little measurable difference in habitat improvement between the non-grazing and grazing alternatives.

The amount of expansion of the alder, willow, and cottonwood habitats in the estimated 1,800 acres of potential would vary. As mentioned, some habitats have degraded to the point that hardwood re-establishment may not be possible without other restoration actions outside this decision. Some level of habitat expansion would be expected over the coming decades. Habitat conditions on the estimated 600 acres of habitat would improve in the project area. An increase in total acres of habitat occupied by willow, alder, and cottonwood would also be expected to increase.

This alternative would result in the greatest rate of expansion of habitat for these species. These effects would continue so long as livestock grazing was not re-initiated under another decision document.

Cumulative Effects: Hardwood habitats, including aspen, cottonwood, alder, and willow, have been adversely affected by a wide variety of actions and activities. Cobb and Vavra (2003) cite ungulate herbivory, conifer encroachment, fire suppression, climatic stresses, and the cumulative interaction of these factors in the decline of aspen in the Blue Mountains. The loss of beaver through historic trapping and road construction has also contributed to the decline of aspen and the other hardwood species. The decline of hardwood habitats through these cumulative effects has reduced habitat for hardwood-

dependent cavity excavator species. Cobb and Vavra (2003) estimate that as much as 95% of the historic aspen habitats in the Blue Mountains have been lost since pre-settlement times. Similar declines may have occurred in cottonwood, willow, and alder in portions of its range.

Within the project area, ungulate herbivory, loss of beaver and that species' influence on riparian function, degradation of riparian habitat through road construction and livestock grazing, conifer encroachment, and fire suppression have likely played the largest roles in the decline of hardwood habitats in the project area. Herbivory has resulted in direct suppression of hardwood reproduction. Loss of beaver, as well as road construction and livestock grazing in riparian areas, has disrupted the function of many (if not most) of the riparian areas in the project area. This has reduced the amount of suitable habitat for these communities to grow and develop in. Conifer encroachment, in large part due to fire suppression, has overtopped hardwood communities and is identified as an effective suppressant to hardwood development (Cobb and Vavra 2003, Riggs et al. 2000). The suppression of fire has also eliminated an important disturbance factor that aids in the regeneration of aspen at a landscape level. The other hardwood species have been similarly affected.

Road construction has affected riparian habitat function through the bisection of riparian areas with fill and culverts, and confinement of stream channel movement in the flood plain. This, combined with the above actions, has altered riparian habitat function and contributed to poorer habitat conditions for a variety of land birds that use riparian areas.

Hardwood and aspen habitat protection, such as constructing livestock and wild ungulate exclosures, has occurred in the project area, most notably in the Happy Camp Creek and Big Springs Campground areas. Two projects to be implemented in the near future include the Deep Vegetation Management and Deep Watershed Restoration Projects. These projects will affect vegetation and riparian habitat conditions in the Deep Creek watershed, and will affect habitat function and quality in all allotments but the Roba Allotment. Table 28 identifies the activities that will be implemented with the Deep Vegetation project. Table 29 identifies the activities that will be implemented with the Deep Watershed Restoration project.

Table 28: Deep Vegetation Project

Activities	Units
Riparian Planting	28 miles
Aspen Enhancement	81 acres
Willow Enhancement	2 sites

Table 29: Deep Watershed Restoration Project

Activities	Units
Grazing Exclosures	227 acres
Riparian Pasture	342 acres
Headcut Stabilization	37 sites
Cutbank Revetments	18 sites
Channel Reconstruction	.25 miles
Culvert Replacements	35 sites
Road Decommissions and Reconstruction	30 miles

The above listed activities will contribute to improving riparian habitat conditions through the increase in hardwood communities, protection of some hardwood habitats through exclosures, and improvements to overall riparian and stream habitat conditions. Such actions will work to reverse an overall long term negative trend in habitat conditions for riparian dependent cavity excavators. Such improvements will be a long term process and are limited to the Deep Creek Watershed, which includes portions or all of the Deep Creek, Little Summit Prairie, Derr and Happy Allotments.

Alternative 1 would not contribute to the cumulative effects of other actions that have and will continue to affect hardwood habitats, and thus habitat for hardwood-dependent cavity excavators. Livestock herbivory is identified as a contributor to the decline of hardwood habitats including aspen, cottonwood, alder, and willow (Riggs et al. 2000; Cobb and Vavra 2003). In absence of livestock herbivory through this alternative, an increasing trend in hardwood habitats would be anticipated across the project area. Without further actions that are not foreseeable (protection from wild ungulate herbivory, return of beaver, selected road decommissioning, planting, etc.), there are portions of the historic hardwood range that would not recover. The rate that the other habitats do recover is also in question. Wild ungulate herbivory may overcome any improvements from the termination of livestock grazing in the project area. Loss of riparian function and source of seeds and new sprouts have long since disappeared and would not change without further intervention. Where existing communities exist, and have the potential for expansion, such improvement would be expected. The lack of cumulative effects would continue as long as grazing actions were not re-authorized through another decision document.

Alternative 2 – Proposed Action

Direct and Indirect Effects: Alternative 2 would likely maintain existing willow, alder, and cottonwood habitats on the estimated 600 acres of riparian habitat in the project area. With full implementation of the riparian hardwood standards, alder, and willow communities would be expected to continue an upward trend of expansion and development with Alternative 2. The extent of that development would depend upon overall riparian function. Alternative 2, with the adaptive management frame work and the flexibility built into the different standards for utilization, bank damage, and soil disturbance, would offer the fastest improving trend. This alternative would be more responsive to the functional condition of the pastures and allotments and would adjust

accordingly. It is understood that there are many habitats within the estimated 1,800 acres of potential habitat that would not re-establish hardwoods because of the extent of the degradation. The change in management of the riparian pasture of the Roba Allotment would provide the most dramatic improvement of alder, willow, and cottonwood habitats in the project area under this alternative. The proposed grazing strategy of early season, alternate year rest would provide even greater benefits to those habitats. Over the long term (50 plus years), suitable nesting habitat in cottonwood plants would be available and better distributed in the North Fork Crooked River, Deep Creek and associated tributaries, improving nesting habitat for these species.

Cumulative Effects: Past, present, and reasonably foreseeable future actions affecting hardwood habitats within the Westside Project Area are described under the cumulative effects section for Alternative 1. All of those actions are pertinent here as well, though their effects would be different. Alternative 2 would continue to contribute to the cumulative effects of management activities through continued herbivory on hardwood communities and their ability to expand and replace themselves. The effects of Alternative 2 would contribute less cumulative effects, as changes in standards and the ongoing modification of standards based upon the functioning condition of the pastures and allotments would provide better protection and reduced utilization of hardwood habitats, such as cottonwood, alder, and willow. The positive cumulative effects of restoration actions (Deep Watershed Restoration and Deep Vegetation Management Projects) coupled with the improving trend in riparian and hardwood function predicted under this alternative would continue to promote an improving habitat trend. Standards implemented under this alternative, coupled with the adaptive management strategy would further reduce the effects of livestock grazing upon the beneficial cumulative effects associated with the Deep Watershed Restoration and Vegetation Management Projects. Habitat for species dependent upon cottonwood, willow, and alder would expand over time.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects*:* Alternative 3 would likely maintain existing hardwood habitats on the estimated 600 acres of riparian habitat in the project area. A slow trend of habitat improvement and expansion may occur under this alternative. Further reduction and loss of hardwood habitats may also result from this alternative as well, if functional condition of riparian habitats continues to degrade or maintain. The slow rate of recovery may affect availability of nesting habitat in the near future, with possible declines as existing mature trees die and fall.

The existing 200-300 acres of aspen habitat would maintain existing conditions over the short term (0-15 years), with the exception of those communities that receive some level of ungulate browsing protection. Over the long term, under Alternative 3, a continued decline in acres of habitat and habitat function would be expected until all but the most inaccessible aspen habitats, and those that are protected from ungulate browsing, remain (Cobb and Vavra 2003). Most of the 200-300 acres of existing aspen habitat would likely disappear from the project area in the long term (50-100 years). Continued herbivory by wild ungulates and livestock would contribute to this decline, coupled with the cumulative effects of past management actions (see Cumulative Effects discussion below).

The effects upon primary cavity excavator habitat described above would continue so long as the grazing permits were active.

Cumulative Effects: Past, present, and reasonably foreseeable future actions affecting hardwood habitats within the Westside Project Area are described under the cumulative effects section for Alternative 1. All of those actions are pertinent here as well, though their effects would be different. Alternative 3 would maintain the existing level of cumulative effects on hardwood communities. The trend of improvement would be slower, and may stagnate or decline. Positive cumulative effects of activities such as Deep Restoration and Deep Vegetation Management Projects would compensate for some of the stagnation or decline in habitat function.

Summary: Forest Plan standards for primary cavity excavators would be met with each of the three alternatives. Alternatives 1 and 2 would meet the desired condition for these species of primary cavity excavators in the future. Alternative 1 would meet that condition in the shortest period of time. Alternative 2 would do so over a longer time period. Alternative 3 would not likely meet the desired condition, or would do so over a very long period of time, due to the effects of the alternative on hardwood habitats and the recovery of those habitats.

Other Wildlife Species

Rocky Mountain Elk and Mule Deer

Affected Environment

Rocky Mountain elk and mule deer are common large ungulate species in the Project area, as well as throughout the Paulina Ranger District and Ochoco National Forest. The project area is within the Ochoco Wildlife Management Unit managed by the Oregon Department of Fish and Wildlife (ODFW). Current population levels and the management objectives for deer and elk populations are listed in Table 30.

Table 30: Management Unit Objectives and Current Populations for Rocky Mountain Elk and Mule Deer in the Ochoco Management Unit, 2004.

Species	Management Unit Objective	Population (2004)
Rocky Mountain Elk	2,600 elk	4,000 elk
Mule Deer	20,500 deer	17,000 deer

Rocky Mountain elk populations currently exceed the management unit objective by 1,400 animals. The ODFW is currently reviewing big game management plans, and may propose an increase in the elk management objective for the Ochoco unit. The management objective may increase to 4,500 elk for the unit. In recent years, elk populations have been as high as 5,000 animals. Mule deer populations are 3,500 animals below management

objectives. Distribution across the management unit and the project area is spotty and dependent upon habitat quality and disturbance factors.

The Ochoco National Forest Land and Resource Management Plan (LRMP) contains standards and guidelines for managing habitats for both Rocky Mountain elk and mule deer. These standards and guidelines prescribe acceptable road densities, cover quantity and quality, and also provide for sufficient forage to meet ODFW management objectives for Rocky Mountain elk and mule deer. Since none of the alternatives affect cover quantity or road density, these habitat components will not be further discussed.

Forage reservations were also decided in the LRMP to meet the state big game standard. The specific use levels by livestock in order to reserve forage for mule deer and Rocky Mountain Elk are displayed in the description of Alternative 3, Chapter Two, Table 6. The utilization standards in this table are taken directly from the LRMP.

All alternatives either meet LRMP forage reservation standards, as is the case in Alternative 3 or exceed standards as in Alternatives 1 and 2. Additionally, current Rocky Mountain elk populations exceed ODFW management objectives and mule deer populations are very near that objective and it is highly likely that forage availability is not limiting population size. Over-winter survival of young mule deer is very low in this unit and winter habitat on adjacent private lands, hunting effects, and mortality due to predation are probably more important factors determining present mule deer populations.

Land Birds, Including Migratory Species

Affected Environment

The *Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington* (Altman 2000) provides a basis for management considerations, conservation strategies, and specific species considerations for habitats on the Ochoco National Forest and in the project area. The conservation strategy identifies eight general habitat types, eighteen different habitat attributes, and eighteen different land and migratory bird species that serve as indicators of habitat condition for those specific habitats. Table 31 below identifies the eight general habitats/habitat types/focal species that are present in the project area and have the potential for livestock grazing effects.

Table 31: Habitat, Habitat Features, and Focal Species of Concern

Habitat	Habitat Attribute	Focal Species
Dry forest	Open Understory-Regeneration	Chipping Sparrow
Mesic Mixed Conifer	Dense Shrub Layer	MacGillivray's Warbler
Riparian Woodland	Large Snags	Lewis's Woodpecker
Riparian Woodland	Canopy Foliage Cover	Red-eyed Vireo
Riparian Woodland	Understory Shrub Cover	Veery
Riparian Shrub	Dense Shrub Patches	Willow Flycatcher
Steppe Shrublands	Patches	Vesper Sparrow
Aspen	Large Trees/Snags w/ Regeneration	Red-Naped Sapsucker

The red-naped sapsucker and the Lewis's woodpecker are addressed in the Management Indicator Species Section for primary cavity excavators. Please refer to that section for more details. The remaining species and habitats will be addressed here.

The US Fish and Wildlife Service have also identified a list of species that are of concern from a population and/or habitat perspective. This list is in response to a 2001 Executive Order signed by former President William J. Clinton. Species are listed by geographic area, called Bird Conservation Regions (BCR). The project area is represented by BCR 10, Northern Rockies Region of the United States. A total of 28 species are identified on that list. Of those 28 species, three occur or are suspected to occur in the project area and have the potential to be affected by the alternatives proposed. They are as follows:

- Lewis's woodpecker
- Red-naped sapsucker
- Brewer's sparrow

The Brewer's sparrow is a sagebrush obligate species with similar habitat requirements to the greater sage-grouse and the vesper sparrow. Potential affects to Brewer's sparrow will be addressed with the vesper sparrow.

Dry Forest – Open Understory-Regeneration – Chipping sparrow: Dry forest ponderosa pine plant associations represent approximately 16,000 acres of habitat in the project area and are distributed throughout each of the allotments. The stand conditions and structure development of these areas varies. Most of this habitat occurs in a pole to small saw log sized age development. Most of these habitats have received intensive harvest and thinning treatments and are relatively open in canopy closure. Thinning activity and use of prescribed fire have worked to open up understory habitat conditions conducive to the chipping sparrow. Patches of reproduction are scatted throughout these habitats, at different stages of development. Habitat is generally abundant and well distributed for this species and habitat type.

Mesic Mixed Conifer – Dense Shrub Layer – MacGillivray's warbler: There are approximately 3,400 acres of moist mixed conifer habitat that exists in the project area.

Most of this habitat is located in the Happy, Derr, and Little Summit Prairie Allotments, but is also represented in portions of the Deep Creek and Roba Allotments. The habitat is fairly well distributed across the project area. The most common shrubs in this plant community, such as *Ceanothus,* form dense stands after significant fire events. To a lesser degree, historic ungulate and livestock grazing, forest management, prescribed fire and other actions may have contributed to reduced shrub understories in these habitats. Habitat condition for MacGillivray's warbler is generally poor or not present in the project area.

Riparian Woodland – Canopy Foliage Cover – Red-eyed vireo: As discussed with the red-naped sapsucker in the management indicator species section, riparian woodland habitat is relatively rare, and in poor condition. Approximately 1,800 acres of potential habitat in the form of riparian areas associated with perennial streams and 200-300 acres of upland seeps and springs exist within the project area. Of that 1,800 acres, less than one third (<600 acres) is estimated to be occupied with hardwood habitats. Many of those acres are not functioning in a habitat condition that provides suitable canopy foliage cover. Habitat for the red-eyed vireo is limited in the project area, and is confined to patches of habitat along perennial streams in each allotment. Distribution in the project areas is generally poor.

Riparian Woodland – Understory Shrub Cover – Veery: This habitat feature follows the same theme of riparian woodland-canopy foliage cover habitat. Habitat is poorly distributed, impacted by past management activities including livestock grazing, timber harvest, alterations to riparian habitat, loss of beaver, road construction, and recreation. Understory shrub cover is generally lacking due to ungulate herbivory (including livestock and wild ungulates). Habitat for the veery is in poor condition and poorly distributed.

Riparian Shrub – Dense Shrub Patches – Willow flycatcher: This habitat also follows along the lines of other riparian woodland habitat conditions. The habitat is limited within the project area, and that which is present is heavily impacted by past management actions. Dense shrub patches are relatively rare, and usually small in size. Some ungulate exclosures contain high quality habitat, but these are few and far between. Habitat for the willow flycatcher has a patchy distribution, with patches generally widely scattered.

Steppe Shrublands – Patches – Vesper sparrow and Brewer's sparrow: The vesper and Brewer's sparrows occupy mountain big sagebrush shrub-steppe communities. These species are common in the Great Basin region, located south of the project area. Habitat within the project area is limited. Approximately 3,500 acres of mountain big sagebrush habitat exists in the project area, scattered throughout the project area in small isolated patches. Most of these communities are a part of a ponderosa pine or juniper woodland plant community (approximately 3,000 acres), and as a result encroached by conifers (see the greater sage-grouse analysis in this report). This habitat condition is not suitable for the Brewer's sparrow, which selects for open, pure sagebrush shrub-steppe habitats. The vesper sparrow, however, finds favorable habitat conditions in these conifer/shrub-steppe habitats. Habitat condition for the vesper sparrow is generally good and distributed through out most of the project area. The Brewer's sparrow has approximately 500 acres of suitable habitat present in the project area, with the bulk of that (400 acres) located around Little Summit Prairie, in the Little Summit Prairie Allotment. Habitat condition is generally good for that species in these habitats, but the habitat is not abundant or well distributed in the project area.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: This alternative would not result in direct or indirect effects to land birds and Neotropical migrants. Habitat would not be further affected with the lack of livestock grazing. Some improvement in the riparian woodland, riparian shrub, aspen, and mesic mixed conifer-dense shrub later habitats would result with the reduction in herbivory. Herbivory by wild ungulates would continue to affect these habitats and may limit their full ability to reach potential (Riggs et al. 2000). Species dependent upon hardwood habitats would see some habitat expansion, but it may not be enough to see changes in populations or their distribution, at least in the short to mid term (0-50 years).

Dry forest and steppe shrubland habitats likewise would not be affected. Their existing condition would be maintained with this alternative. With the lack of livestock grazing, foraging habitat in the dry forest habitats may improve with the increase in leaf litter and resulting increase in insects, and seed production with more of the grasses developing to seed.

The duration of these effects would continue indefinitely unless the decision was revisited or a new analysis was completed that authorized grazing on the allotments in the project area.

Cumulative Effects: A variety of actions and activities have affected the habitats described above over time. Livestock grazing, fire suppression, timber harvest and thinning, trapping of beaver, and road construction are likely the most significant actions that have affected these habitats. These activities have altered riparian and upland habitat that has affected the species identified in this assessment.

Livestock grazing has modified vegetation communities in the riparian and upland areas. Particularly detrimental was the sheep grazing that occurred in the late 1800s and early 1900s before grazing was actively controlled by the Forest Reserve and National Forest management of the project area. Since then, grazing has switched from primarily sheep to all cattle operations. Implementation of increasingly stringent standards over the past 100 years has also stopped the rapid downward trends of these allotments, and in some cases, reversed those trends into a gradual upward trend in habitat function. In riparian areas, historic livestock grazing has contributed to the decline of hardwood communities, changes in meadow habitat through the down cutting of stream channels and lowering of water tables, changes in species composition and diversity, and introduction and spread of noxious weeds. With the exception of noxious weeds, alterations to riparian habitat have occurred within all riparian areas in the project area. The effects are particularly acute in the perennially flowing stream systems in the project area. Noxious weed spread has occurred primarily in the southern two thirds of the project area.

Livestock grazing has also affected upland areas as well. Species composition, particularly in regards to bunch grass and some forb communities were altered in part by livestock grazing. This is particularly true for the stiff and low sagebrush communities in the project area. Changes in species compositions, from desirable to less desirable species, have resulted in poor condition ratings (see Chapter Three, Issue #1). Monitoring plots from the early fifties to the early seventies indicate this occurring in the Deep Creek, Derr, Roba, Little Summit Prairie, and portions of the Happy Allotments. In some of the forested

communities, historic sheep grazing may also have influenced the increases in stand densities and changes and tree species compositions, particularly in the more mesic conifer sites.

Fire suppression and the resulting changes in forest structure and species composition have affected land bird habitat as well. Combined with timber harvest, and interactions with historic livestock grazing, fire suppression has, in general, allowed the development of denser stands with compositions leaning towards shade tolerant, fire intolerant tree species. For land bird species that select for those habitats, habitat quality and quantity increased. Species that select for more open, early seral mature habitats, habitat quality and distribution declined. Fire's role in the regeneration of hardwood communities, particularly in aspen, was also disrupted and has contributed to the decline in aspen habitats in the project area. Willow and alder may be similarly affected in some portions of the project area. Past fire activities include approximately 14,204 acres of prescribed fire application. Many of these treatments were implemented to treat activity fuels (timber harvest slash, etc.), but some broadcast burning intending to reduce natural fuel loadings also occurred. In some ways, these treatments have reversed some of the effects of past fire suppression. An additional 8,500 acres of prescribed fire is also proposed with the Deep Vegetation Management Project.

Timber harvest and thinning has altered forested habitats. The general trend has been the decline in larger, mature trees, being replaced by younger, denser stands. Stand densities are relative, and in many cases, the thinning of those young stands has made them less dense. Species composition has also changed and was influenced by timber harvest. Similar to fire suppression, changes in stand structure and species compositions of forest habitats from timber harvest actions has affected the species diversity, distributions and populations of land bird species in the project area. Seven timber sales have occurred in the project area with in the last 20 years, and include the Deep Salvage, Dippy Beaver, Summit, Rainier, Fryton, Fry, and Barn Timber Sales. A total of 8,149 acres of forested habitat were affected by those sales. A variety of harvest strategies were implemented including clear cut harvests, seed-tree and shelterwood harvests, understory and selective thinning, and other similar actions. In addition to these timber sales, the Deep Vegetation Management Project will add an additional 6,300 acres of timber harvest, primarily middle story and understory thinning, within the Deep Creek watershed. Planting of hardwoods in streams in the project area will also occur with this project. This would affect all but the Roba and the North Pasture of the Happy Allotments.

The loss of beaver in the watershed has affected riparian habitat and the function of hardwoods and meadow complexes in the project area. Declines in the hardwood communities, exacerbated by livestock grazing and fire suppression, can be attributed to the trapping and removal of beavers in the project area. Likewise, overall riparian habitat function, particularly in meadow areas, has declined as a result of channel down cutting and a drop in the water table. This has affected the vegetation communities that exist in the project area, and thus the species of land birds that are present. Beaver played a key role in maintaining the function of those meadow complexes by stabilizing erosion, controlling stream flow in the spring, and promoting bank stabilizing hardwoods and sedge communities.

Road construction has affected riparian habitat function through the bisection of riparian areas with fill and culverts, and confinement of stream channel movement in the flood plain. This, combined with the above actions, has altered riparian habitat function and contributed to poorer habitat conditions for a variety of land birds that use riparian areas.

The Deep Watershed Restoration Project will implement stream and riparian habitat enhancement projects in the Deep Creek Watershed, and would affect the same area identified in the Deep Vegetation Management Project. Protection and reconstruction of stream habitat and riparian areas, reversing of existing stream channel degradation, and the closure of roads will be implemented with this project. These activities will help to reverse some of the adverse cumulative effects of activities described above.

Table 32: Deep Vegetation Management Project

Stream and Riparian Enhancement Projects	Units
Various Timber Harvest	6,393 acres
Thinning (some acres harvested with commercial timber sales)	6,285 acres
Underburning	8,741 acres
Riparian Planting	28 miles
Aspen Enhancement	81 acres
Willow Enhancement	2 sites
Meadow Enhancement	825 acres
Mountain Mahogany Enhancement	16 acres

Table 33: Deep Watershed Restoration Project

Stream and Riparian Enhancement Projects	**Units**
Grazing Exclosures	227 acres
Riparian Pasture	342 acres
Headcut Stabilization	37 sites
Cutbank Revetments	18 sites
Channel Reconstruction	.25 miles
Culvert Replacements	35 sites
Road Decommissions and Reconstruction	30 miles
Road Closures/Inactivation	17 miles

Alternative 1 would not result in cumulative effects to land bird habitat in the project area. This alternative would terminate grazing in the project area, removing the grazing of livestock as a disturbance factor that alters habitat conditions for land bird species. This would apply in both the riparian areas and uplands. In absence of livestock grazing, some vegetation communities would change. Hardwood communities would see some improvement and expansion where riparian and upland habitat conditions would allow and

wild ungulate browsing did not continue to suppress these communities. Habitats for species dependent upon riparian woodland and shrub communities would likely see some improvement and expansion. This would benefit those species and possibly expand their populations and distribution in portions of the project area. Some bunch grass communities in the shrub-steppe habitats may also re-develop and expand as well.

Mesic mixed conifer-shrub understory habitats would see little change as wild ungulate browsing would continue to suppress that shrub understory development. Little change in species presence, diversity, or populations for species, such as the MacGillivray's warbler would occur with this alternative.

Dry forest habitats would see little overall change without the cumulative effects of livestock grazing.

Alternative 2 – Proposed Action and Alternative 3 – Current Allotment Management

Direct and Indirect Effects: Direct effects of nest disturbance and loss with livestock grazing may occur, although the extent of that effect would likely be minor and immeasurable. Indirect effects to vegetation conditions would occur with both alternatives. The following effects are anticipated for each of the vegetation communities reviewed:

Dry Forest: The action alternatives would result in indirect effects upon the dry forest habitats utilized by the chipping sparrow. Effects would be to foraging habitat. The level of effect would depend upon the level utilization and season of use that occurs in any one pasture and/or allotment. Early season grazing, at utilization levels identified in each alternative, would reduce ground cover that may affect the quality of foraging habitat for this species. Reductions in ground cover may result in lower insect abundance. Early season grazing may also affect seed production and seed availability as forage. Late season grazing would result in much less adverse effects, as utilization of this habitat falls off substantially later in the season. Grasses and forbs have generally desiccated and are not very palatable to livestock.

Alternative 2 would likely result in lower levels of effects, based upon the adaptive management strategy and the reduced levels of forage utilization anticipated for each of the allotments. With the exception of the North Pasture of the Happy Allotment, the remaining allotments and pastures are either Functioning-at-Risk or Non-functioning. This would result in lower permitted utilization levels in the upland dry forest habitats, and elsewhere. Forage habitat for chipping sparrows should be better with this alternative.

Mesic Mixed Conifer: The action alternatives would result in small indirect adverse effects to habitat for the MacGillivray's warbler and other similar species. Livestock grazing, cumulative to wild ungulate browsing, would continue to suppress upland hardwood and shrub communities within the mesic mixed conifer habitat types (Riggs et al. 2000). Habitat for this species would not expand or improve since management activities which would significantly improve this habitat (conifer thinning and prescribed fire) are not part of the action alternatives.

Alternative 2 has more stringent utilization standards for the utilization of upland shrub species. It is anticipated, however, that deer and elk would compensate, resulting in

increased herbivory by those species. This would result in little change in upland shrub habitat conditions in these mesic mixed forest types (Riggs et al. 2000).

Riparian Woodland and Shrub: The action alternatives would continue to adversely affect riparian woodland and shrub habitats in the project area. Currently, poorly or Non-functioning habitats would not improve dramatically with Alternative 3. Alternative 2 would result in an improving trend in riparian woodland and shrub habitats as the adaptive management strategy in this alternative would reduce utilization of hardwoods and improve overall riparian habitat function. Alder, willow, and cottonwood communities would slowly expand and improve in size and age-class diversity. The changes in management of the riparian pasture in the Roba Allotment, with Alternative 2, would further improve riparian woodland and shrub habitats along the North Fork Crooked River. The rest and early season grazing proposal may result in continued improvement in habitat condition of the hardwoods. This pasture is generally in an upward trend, and would continue to do so under Alternative 2.

With Alternative 3, red-eyed vireo, veery, and willow flycatcher habitat would either maintain existing conditions or potentially decline over time. Alternative 2 would result in an improving trend for habitat of these three species, particularly associated with the Riparian Pasture of the Roba Allotment.

Steppe Shrublands: Neither alternative would result in measurable effects to existing mountain big sagebrush shrub-steppe habitat in the project area. These habitats comprise a very small portion of the project area. Utilization levels in these habitats are generally low, primarily due to early desiccation of palatable grasses and forbs. The physical structure of the shrub-steppe habitat would not change appreciably. Grass and forbs and cover associated with them also would not change appreciably. Habitat for the vesper and Brewer's sparrows would maintain in their current conditions with implementation of either alternative.

The duration of these effects would continue so long as grazing was continued on these allotments per the decision to implement either action alternative.

Cumulative Effects: Past, present, and reasonably foreseeable future actions affecting hardwood habitats within the Westside Allotments Project Area are described under the cumulative effects section for Alternative 1. All of those actions are pertinent here as well, though their effects would be different.

Dry Forest: The action alternatives would result in cumulative effects to the dry forest habitat conditions described in this analysis. Livestock grazing would continue to contribute to changes in forest structure and species composition as it has in the past. The extent of that influence is minor, and is influenced by past, present and reasonably foreseeable future actions. Livestock grazing would also continue to affect understory development and composition, particularly in the herbaceous plant component, but also in the hardwood shrub species as well. This would continue to affect the quality of foraging habitat for some land birds and the quality of nesting habitat for others. These effects would be cumulative to past livestock grazing, fire suppression and past timber management actions in the project area. The level of cumulative effects would be less with Alternative 2 with the lower utilization levels expected under the adaptive management strategy proposed.

Mesic Mixed Conifer: The action alternatives would result in cumulative effects to habitat for land birds in the mesic mixed conifer forest habitats. The effects would come primarily in the suppression of hardwood and shrub communities in these habitats. Livestock grazing, as well as changes in forest communities from fire suppression and timber harvest, have altered understories in these community types. Continued suppression of those communities would result in adverse affects to land birds that utilize those habitats for nesting, foraging and cover from predators. Although not a Federal action, wild ungulate herbivory would continue to affect and suppress this habitat condition in the project area. Little difference between Alternatives 2 and 3 would be anticipated due to the compensatory herbivory of wild ungulates.

Riparian Woodland and Shrub: The action alternatives would result in cumulative effects to habitat for land birds in the riparian shrub and woodland habitats. The presence of livestock grazing would continue to suppress, and otherwise affect, hardwood habitat development, and contribute to the cumulative effects on that feature of the habitat with Alternative 3. Alternative 2, with the adaptive management strategy proposed, along with additional and different standards for bank stability, upland shrub utilization, and herbaceous utilization, would result in a reduced level of cumulative effects on those habitats when compared to Alternative 3. Upward trends would continue and perhaps increase in rate with this alternative. The cumulative effects of the Deep Vegetation Management and Deep Restoration Projects will further enhance the improvement of some of these habitats.

Steppe Shrubland: Alternatives 2 and 3 would continue to contribute to the cumulative effects of other activities on the shrub-steppe communities. The level of effects contributed, however, would likely be small because of the low level of utilization and use of these habitats by livestock grazing. Season of use of pastures (early vs. late) would influence the overall level of effect that would occur, with greater cumulative effects occurring with early season of use. Alternative 2, with its adaptive management strategy and modified standards for utilization based upon functional classification, would likely see an improving trend in some habitats with increases in some species types, like bunch grasses.

The duration of cumulative effects associated with Alternatives 2 and 3 would persist as long as allotment permits were active and pastures were grazed.

Summary: No Forest Plan standards apply directly to landbirds, including Neotropical migrants. Implementation of Alternative 1 would most likely meet the desired condition of habitat for a variety of landbirds, particularly those associated with riparian habitats. Others would see a less dramatic improvement due to cumulative effects primarily associated with wild ungulate browsing. Alternatives 2 and 3 would either maintain existing conditions, or in the long term meet desired conditions for some of the habitats identified in the analysis. Riparian habitats would improve over the long term, and may eventually meet desired conditions in the future.

Social and Economic Values

Affected Environment

The Westside Project area includes portions of both Crook and Wheeler counties. The Ochoco Land and Resource Management Plan (LRMP) (USDA 1989) recognized that the ability of local ranchers to utilize Forest forage during the summer months, while producing several crops of hay on the base ranch for winter use, is economically essential to many ranches (LRMP page 3-29). All of the permittees grazing livestock within the Westside Allotments Project area live and work near the project area and use their grazing permits to supplement year-round grazing operations. Analysis of data from the Economic Profile System Community (EPSC) report indicates that agriculture and forest industries are among the most important in rural Crook (includes Paulina) and Wheeler (includes Mitchell) Counties. Agriculture and forest industries accounts for 16% (third highest) of the employment in rural Crook County and 20% (second highest) in rural Wheeler County. Livestock ranching operations remain an important part of the local culture and the economic base.

The Westside Allotments Project Area is grazed during the summer months by four local ranchers. They utilize these summer months to graze their livestock on the Westside Allotments to free up land for hay production on their base ranches. The hay that is grown and harvested during the summer months is stockpiled for use in the winter. The Westside Allotments can provide high quality forage for cow/calf herds.

Alternate sources of pasture in rural Crook and Wheeler Counties are limited. Available land is normally allocated to a specific function such as winter/summer/fall/spring pasture or hay/crop production. When pasture is available, prices can range from $12/AUM (non-irrigated) to upwards of $20/AUM (irrigated) (per comm. Rick Paul), the final cost for purchasing alternate sources of pasture for the displaced livestock based on current permitted livestock numbers could range from $56,592 ($12/AUM) to $94,320 ($20/AUM). The other option is to pasture the livestock and feed them hay. With the price of hay running around $60-85/ton (per comm. Rick Paul), this could cost between $141,480 ($60/ton) to $200,430 ($85/ton) to feed the displaced livestock. Both options would add additional operating cost for the permittees and may prove to be economically unfeasible for some of the Westside Allotments Permittees.

The Forest Service collects grazing fees ($1.79/AUM 2005) from permittees each year. Approximately 50% of the fees collected go to the Federal Treasury and the remaining 50% is usually returned to the Forest as “Range Betterment Funds”. Range Betterment Funds are utilized to finance range improvement projects designed to improve the rangeland health and livestock management. The Forest Service normally provides the materials and the permittees supply the labor.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Under the No Action alternative, all Term Grazing Permits would be cancelled within two years of implementation of the decision. The requirement to implement this decision no sooner than two years following the project decision is pursuant to Forest Service Handbook (FSH) 2209.13 part 16.24, and the Code of Federal Regulations (36CFR 222.4 (4) (1)). Maintenance of range developments on the allotments would no longer be the

responsibility of the permittees. Subsequent decisions would need to be made regarding retention and maintenance of any improvements (such as water developments and fences). All developments no longer needed for resource management would be removed.

Direct and Indirect Effects: New term grazing permits would not be reissued resulting in a permanent elimination of permitted livestock grazing on National Forest Service lands within the Westside Project Area. Existing Term Grazing permits would be cancelled. The current permittees depend upon the use of Forest Service grazing allotments for summer feed and to free up land for hay production (LRMP 1989). The hay produced during the summer months is stockpiled for use during the winter. Permittees would have to find alternative means, such as private pasture or purchasing hay, to feed their livestock. As previously discussed, this could prove to be economically unfeasible for some of the permittees with allotments in the Westside Allotments Project area.

Alternative 1 would result in less revenue to the permittee and to the local communities of Paulina and Mitchell as well. The loss of the current annual AUM value ($7.86 Region 6) to the permittees would be $37,068. Purchase of private pasture or hay would add additional monetary hardship to the permittees. This would affect the local communities economically as well as socially if less money was available to be spent in the rural ranching communities of Paulina and Mitchell, with a possible reduction of available services such as local goods, available services, employment, or income. Mitchell would be impacted the greatest as three of the four permittees base ranches are located in the immediate area of this town. The rural ranching communities of Paulina and Mitchell have come to view livestock grazing on public lands as not only a necessary commodity to their small rural communities but as a time-honored use that has become a fundamental part of their community's social fabric and well being. These rural ranching communities would likely react to the loss of grazing privileges on the Westside Allotments as a personal affront to rural America and their lifestyle. The Forest Service would lose annual grazing fees of $8,442 (2005).

Cumulative Effects: All internal pasture and allotment fences no longer needed for resource management would be removed at Forest Service expense. Water developments would be evaluated on a case-by-case basis and those identified as no longer necessary would be removed. Those water developments retained for other resource needs would require funding for inspection and maintenance on an annual basis.

Summary: Alternative 1 would have the greatest negative socio-economic impact on affected livestock permittees and the communities of Mitchell and Paulina. Alternative 1 would have more of an impact on socio-economics than both Alternative 2 and 3. This alternative would not meet Forest Plan Goals and Objectives or Forest Service Policy (FSM 2203.1 and 2202.1), by providing available forage and thereby contributing to the economic and social well being of local communities. Alternative 1 would only partially meet the Purpose and Need outlined in Chapter One of this analysis, however, it would lead to resource conditions that meet the Desired Conditions described in Chapter One.

Alternative 2 – Proposed Action

The Proposed Action would authorize livestock grazing in all five allotments under new grazing management standards using an adaptive approach. Grazing management standards would be implemented based on an assessment of the level at which resources

within pastures or allotments are functioning. A system is functioning when the soil of the area and the vegetation that it supports are in satisfactory condition; water from precipitation and runoff is effectively absorbed, routed, and retained longer within the watershed; erosion occurs slowly, is limited in scope, and is filtered by landform; and vegetation and systems can withstand and recover quickly from disturbance events.

Direct and Indirect Effects: Proposed standards under this alternative would require permittees to increase their livestock management efforts in order to meet stricter disturbance, stubble height, and utilization standards. This could entail hiring additional personnel in order to meet the proposed standards. There is the possibility that in order to meet the proposed standards, reductions in permitted AUMs or season of use would be necessary. The current annual AUM value is $7.86 (R6 2004). Under the Proposed Action, the Roba Allotment would be rested for three years. The loss of the current annual AUM value ($7.86 Region 6) from resting the Roba Allotment would be $9,825 or an estimated $29,475 over the three-year rest period. Reductions in AUMs or season of use could require the permittees to purchase alternative pasture or hay resulting in an additional monetary expense. Economic and social effects to the rural ranching communities of Paulina and Mitchell would be minimal with the continued operation of the affected ranching operations. There is the possibility that these rural ranching communities would reap some economic benefit if the permittees locally purchased pasture or hay.

The Forest Service would retain most of the annual grazing fees equaling $6,204 (2005). This amount would drop as AUMs are adjusted to levels necessary for meeting the proposed management standards. All internal pasture and allotment fences as well as water developments would remain and be maintained by the permittees, thereby saving the Forest Service the cost of removal.

Cumulative Effects: There should be no measurable cumulative effects to the affected permittees ranching operations or the associated benefits such as local goods, available services, employment, or income to the rural ranching communities of Paulina or Mitchell.

Summary: Alternative 2 would have limited negative socio-economic impacts on the affected livestock permittees and local communities. Alternative 2 would have less of an impact on socio-economics than Alternative 1, but greater than Alternative 3. This alternative is consistent with Forest Plan Goals and Objectives and Forest Service Policy (FSM 2203.1 and 2202.1) by providing available forage and thereby contributing to the economic and social well being of local communities. Alternative 2 would meet the Purpose and Need and lead to resource conditions that meet the Desired Conditions outlined in Chapter One.

Alternative 3 – Current Allotment Management

Alternative 3 reflects current management of the five allotments. The allotments would be managed according to the standards and criteria established in the Forest Plan, Allotment Management Plan, Annual Operating Instructions, and the Term Grazing Permit. The allotments would be monitored throughout the grazing season for stubble height, streambank alteration, and woody species utilization. Annual Operating Instructions (numbers and seasons of use) would be adjusted in response to the previous years monitoring results and expected climatic conditions for the upcoming grazing season.

Allotments failing to meet standards would have annual adjustments in livestock numbers, season of use, and nonuse on pastures with serious noxious weed concerns.

Direct and Indirect Effects: Under this alternative, there would be no direct socio-economic effects to the livestock permittee or local communities because the current livestock operations would continue as they are presently being managed. Indirectly there could be socio-economic effects to the permittees associated with this alternative because continuation of the same grazing management standards may result in a reduction in the amount and quality of available forage, which could result in reduced calving weight gains and season of use.

The Forest Service would retain annual grazing fees of $8,362 (2005). All internal pasture and allotment fences as well as water developments would remain in place, and be maintained by the permittees, thereby saving the Forest Service the cost of removal.

Cumulative Effects: Under Alternative 3 there are no measurable cumulative effects on the socio-economic status of the livestock permittees or local communities. Implementation of Alternative 3 is not expected to affect the local goods, available services, employment, or income in the rural ranching communities of Paulina and Mitchell.

Alternative 3 would not have a negative socio-economic impact on the livestock permittees and local communities. Alternative 3 would have a positive impact on socio-economics compared to Alternatives 1 and 2 because it maintains the current levels of livestock grazing. This alternative is consistent with Forest Plan Goals and Objectives and Forest Service Policy (FSM 2203.1 and 2202.1) by providing available forage and thereby contributing to the economic and social well being of local communities.

303 (d) Listed Streams

Affected Environment

The Ochoco NF Land and Resource Management Plan (LRMP) requires that all streams meet or move toward attainment of state water quality standards. Currently, ten streams within the Westside Allotments Project Area are listed on the 2002 Oregon Department of Environmental Quality (DEQ) 303(d) list of impaired waterbodies for exceeding temperature criteria (Table 34). Streams that exceed an average daily maximum temperature of 64ºF during any seven consecutive days are in violation of DEQ, LRMP, and PACFISH/INFISH standards. Only Keeton, Fry, Mac and Fort Creeks exhibit temperatures that do not exceed this standard. Oregon DEQ reports that Toggle Creek will also be added to the forthcoming 2004 303(d) list. Temperature data does not exist for smaller and intermittent streams in this area.

Streams within the Westside Allotments Project Area may actually exceed DEQ standards for other pollutants such as bacteria (e.g., fecal coliform), dissolved oxygen, nutrients and sediment, but no data yet exist for these parameters. Concentrations of these pollutants may exceed state criteria in some reaches, particularly when flow is low and livestock use in high.

In 2006, DEQ will develop a Total Maximum Daily Load (TMDL) for all currently impaired waterbodies. This process will include an extensive monitoring effort (beginning in summer, 2005) that may illuminate water quality problems beyond those currently known. The TMDL process will also quantify all natural (i.e., background levels) and anthropogenic (i.e., point and non-point) sources of pollution and determine potential for Paulina Ranger District (RD) streams. Then, in concert with the Forest Service, a plan will be developed to reduce stream temperatures so that these streams may be removed from the 303(d) list. A water quality restoration plan (USDA 2001) has already been developed for the Deep Creek Watershed. A similar strategy would likely be completed for other streams on the Paulina RD in an effort to improve conditions after the TMDL is complete.

Table 34. Maximum 7-Day moving average stream temperatures for streams within the Westside Allotments Project Area. Steam names with bold font indicates 303(d) listed waterbodies.

Stream	Maximum 7-Day Moving Average Temperature (°F)										
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Crazy	64.5	-	-	-	-	69.5	-	-	-	-	-
Deep	73.5	73.4	74.9	74.0	-	73.9	77.8	70.5	84.3	80.5	75.9
Dipping Vat	-	-	-	-	-	-	-	74.1	-	62.3	-
Double Corral	71.3	-	-	-	-	75.8	-	-	-	-	-
Dry Paulina	-	68.0	-	-	-	-	-	-	-	-	-
Fort	-	-	-	-	-	-	-	-	-	-	66.9
Happy Camp	-	-	-	-	-	-	76.7	-	78.5	77.4	74.5
Jackson	76.7	-	-	77.6	-	77.0	75.6	-	-	-	73.6
Keeton	-	-	-	-	-	-	-	-	-	-	60.2
Little Summit	64.5	71.3	69.3	67.7	70.7	85.8	70.5	-	-	74.2	69.8
Mac	-	-	-	-	-	-	-	-	-	-	60.6
N. Fk. Crooked	-	-	-	-	-	-	-	-	80.9	83.3	78.4
Roba	-	-	-	-	-	-	70.9	-	73.7	-	-

Since stream shading by riparian vegetation is a critical component of moderating temperature, it is a commonly used surrogate to achieve proper thermal conditions. The LRMP and PACFISH/INFISH require that streams be shaded for 80% of their length or 100% of their potential. Stream shade varies naturally by stream type, vegetation type, and from the influence of topographic features. For example, an E-stream type in a sedge/rush community would naturally be expected to have less shade than an A-stream type in a narrow forested valley. Table 35 lists surveyed shade values for streams of the Westside Allotments Project Area and the expected natural range of values for that stream type (the latter information is adapted from the Deep Creek Water Quality Restoration Plan, 2002). Every stream is currently below its potential shade except for Keeton and Fry Creeks, although Fort Creek is probably now above 80% shade.

Table 35: Average shade values (mean for all surveyed reaches) for streams within the Westside Allotments Project Area. Only streams with temperature and/or shade information are provided. Stream names with bold font indicates those that do not meet PACFISH/INFISH/LRMP shade standards]

Stream Name	Average Shade, for Entire Surveyed Stream Length (%)	Predicted Potential Shade, by Stream Type (%)[1]	Functional Class Determination[2]
Burnt Corral	40	60	FAR
Chamberlain	53	60	FAR
Crazy	48	65 – 80	FAR/PF*
Deep	40	60 – 75	FAR
Derr	10	65	ND
Dipping Vat	59	60 – 75	FAR
Double Corral	25	60 – 75	FAR
Dry Paulina	63	65 – 75	NF
Fort	77	80	PF
Fry	80	75 – 80	PF
Happy Camp	31	60 – 80	NF/FAR*
Jackson	32	60 – 75	FAR
Keeton	82	75 – 80	PF
Little Summit	46	60 - 80	FAR
Mac	52	75 – 80	PF
NF Crooked R.	21	60	FAR
Roba	56	60 – 80	NF
Thornton	37	60 – 65	NF/FAR*
Toggle	28	60 – 65	NF/FAR*

[1] These values do not account for local topographic shade. The major Rosgen channel types for each stream have been classified during stream surveys but short reaches of different stream types are probable.

[2] This determination, the methodology used for deriving it, and the discussion thereof can be found in the Stream Channel Existing Condition Section.

* These streams were broken into two reaches for the purposes of analysis since conditions varied appreciably throughout their length. See Stream Channel Existing Condition section for more detail.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Direct and Indirect Effects: Selection of Alternative 1 would produce the most rapid improvement in stream temperatures and shade conditions and would meet Riparian Management Objectives from INFISH/PACFISH. Table 36 shows the expected trends among all reaches for this alternative. Most stream types, associated wetlands, and floodplains, except D-, F-, and G-channels, would benefit immediately from the removal of livestock grazing and a reduced browsing pressure on riparian vegetation. D-, F- and G-streams would re-achieve equilibrium over a longer period of time whereby they redevelop a pattern, dimension, and profile that is capable of transporting its flow and sediment (see the Fisheries Section). Morphologic recovery of these stream types, wetlands, and floodplains is not likely to occur within a 15 year timeframe.

Although stream temperature was not a criteria used in determining functional class (Appendix C), reaches with Functioning-at-Risk vegetation would improve most rapidly because many of the key components for recovery already exist (i.e., presence of desirable species). Non-functioning reaches should realize slower but steady improvement of thermal conditions. Some of these reaches, however, may still need active restoration such as planting desirable species where they are not yet established.

Considerable measurable improvement (i.e., >5ºF mean annual temperature) in stream temperatures may occur in the short-term (<15 years) but would be greater in the long-term (>15 years). Extensive riparian vegetation must be established throughout the entire reach to be effective at reducing overall stream temperatures. Climatic variability (i.e., annual temperature variation and global warming) is still expected, however, to play the most important role in dictating short- and long-term stream temperatures.

The section on Impacts to Riparian and Upland Vegetation (Issue #1) describes the direct and indirect effects of livestock grazing on vegetation while effects to stream channels are described in the Fisheries section. The removal of livestock under this alternative would result in increased growth, vigor, and expansion of willow, alder, sedges, rushes and other riparian obligate vegetation in wetlands and floodplains As these plants expand, shade conditions, and thus stream temperatures, would improve. The actual extent of improvement would depend on a variety of local factors such as site capability, departure from historic means, elevation, flow, proximity to spring sources, groundwater interactions, and aspect. In lower gradient E-type reaches sedges are often the dominant potential vegetation and would contribute less to stream shading than willows and alders in A- and B-type streams (Table 36). Narrow, deep streams such as E-types are protected from excessive solar heating by having low width to depth ratios whereas C-types are shallower and more dependent on topographic and vegetative shade.

Cumulative Effects: Many past projects have occurred within the Westside Allotments which have been both beneficial and detrimental to shade conditions. Riparian planting has occurred in Little Summit, Toggle, and Dipping Vat Creeks which has slightly improved shade in the planted reaches. Headcut stabilization in Derr, Toggle, and Happy Camp Creeks has improved floodplain connectivity which increases soil moisture and allows riparian vegetation to survive; no quantified estimate of increased growth is available here, however. Replacement of undersized culverts in Buck Hollow, Happy Camp and Little Summit Creeks has improved flow conditions near road crossings which may also have benefited riparian species. Artificial large woody debris placement activities have occurred in Jackson, Happy Camp, Deep, and Buck Hollow Creeks, and have slightly improved shade conditions in these reaches. Approximately 25 historical and present-day exclosures occur within the project area (Table 25), and most of them protect riparian areas or spring sources. Where these have been maintained, exclosures have improved shade conditions dramatically, often despite continued ungulate browsing. An inventory is currently underway to determine the condition of these exclosures which will lead to prioritization of future maintenance. In Properly Functioning and Functioning-at-Risk reaches (Table 35), exclosures are the most effective management activity for improving shade conditions. These sites are generally small, however, and the positive effect on watershed-scale temperatures is quickly negated by limited shade downstream.

No measurable adverse effects are occurring to shade or stream temperatures from the Summit Timber Sale or from the Deep Salvage Sale (USFS 2004a). Several additional timber sales (including Fry, Watson, Fryton, Rainier, and Barn) have occurred in Keeton, Fry, Mac and Fort Creeks. In most cases, riparian harvest has opened the overstory canopy and actually served to increase hardwood growth. Mac Creek, in particular, has no shade producing conifers near the stream for much of its length but has a tall, dense gallery of alder to provide effective near-stream shade. Most of these timber sales, however, did not contain adequate riparian buffers and contributed a great deal of short-term sediment (over a two to five year period) to the channel. This exacerbated channel stability problems, contributing to a widening of streams that further increased temperatures.

The Deep Creek Vegetation Management Project (2004a) will consist of timber sales and vegetation management projects that would improve overall upland and riparian forest health. When fully implemented, shade conditions would be improved and stream temperatures would remain static or improve slightly. There are 24 acres of commercial harvest and 354 acres of precommercial thinning approved under this project which will be designed to maintain or improve vegetative shading. In addition, there are 28 miles of approved riparian planting which would considerably increase stream shade in many reaches in the long-term (>15 years). While stand protection will be necessary for any planting activity, riparian plant growth would ultimately be faster under Alternative 1.

The Deep Creek Watershed Restoration Project (2004b) will also include activities designed to increase stream shade. Activities that will directly affect shading include construction of 227 acres of livestock exclosures and the creation of a new riparian pasture in lower Deep Creek. Indirect benefits to riparian shade will come through creation of seven off-channel water developments, 3.6 miles of large wood placement, cutbank revetment and various other in-channel restoration projects. The construction of livestock exclosures and pastures would therefore be unnecessary under Alternative 1 in order to improve overall hydrologic conditions.

Prescribed burning activities could, however, considerably decrease shade in localized reaches if fire consumes riparian vegetation. Under the Deep Creek Vegetation Management Project, 612 acres of burn blocks occur within RHCAs, creating the potential for backing fire (although no direct ignition would occur in RHCAs) to decrease shade over short distances (probably <100 meters). RHCA burn blocks are not located near class I and II streams but localized shade may be reduced in class III, IV, and V streams. Similarly, 25 acres of RHCA-proximate burning under the Fryton/Barn EA (USDA 1998) could be subject to backing fire from adjacent burn blocks in the Fort Creek Watershed. Prescribed fire may also lessen conifer encroachment and facilitate establishment of hardwood shrubs by reducing competition. Any additional forage that grows in riparian areas after burning would not be grazed by livestock under Alternative 1, thereby limiting the possibility of hardwood browsing to ungulates and trespass livestock.

Alternative 1 would have beneficial effects to private landowners downstream due to improvements in water quality. Colder water in streams of the Westside Allotments Project Area would eventually be delivered downstream that would primarily benefit salmonids. Trout population in Beaver Creek and the Crooked River are generally very limited at present, primarily due to high water temperatures, but may expand their range if thermal conditions improve. A reduction in suspended sediment would also improve

downstream water quality. Benefiting streams that flow off-Forest would include Paulina, Burnt Corral, Indian, Roba, Hewed Log, Dipping Vat, Dry Paulina, Keeton, Fry, Mac, and Fort Creeks, as well as the North Fork Crooked River. It is uncertain how much thermal improvement would occur downstream in the larger, 4th field waterbodies (i.e., upper John Day River, upper Crooked River, and South Fork Beaver Creek) as a result of temperature decreases on the Ochoco NF.

A 2006 Oregon DEQ TMDL will attempt to address the existing condition for all major water quality parameters in the North Fork Crooked River and Deep Creek systems, including temperature, dissolved oxygen, bacteria, sediment, nutrients, and conductivity.

Alternative 2 – Proposed Action

Direct and Indirect Effects: Selection of Alternative 2 would improve stream temperatures and shade conditions and meet Riparian Management Objectives from INFISH/PACFISH (Table 36). All stream types, associated wetlands, and floodplains, particularly in perennial reaches, would expand their riparian vegetation, and therefore shade, in the long-term (>15 years) and thus meet Riparian Management Objectives. D-, F- and G-streams would not benefit appreciably from effective implementation of tightened standards because they are still hydrologically-limited (see Fisheries Section). Instead, these stream types, wetlands, and floodplains would be expected to follow a linear process of morphological development whereby they reshape their pattern, dimension and profile until a new energy balance is achieved (Rosgen 1996; Bengeyfield and Svoboda 1998; Lockwood and Lockwood 1993; Van Haveren and Jackson 1987; Harvey and Watson 1986). For this reason, morphologic recovery in these reaches is not likely to occur within a 15 year timeframe. If additional disturbances occur within the watershed (e.g., new headcuts or excessive sedimentation from landslides), D-, F- and G-streams would be expected to remain degraded or not improve at all in the long-term (>15 years) without further management action.

Although stream temperature was not a criteria used in determining functional class (Appendix C), reaches with Functioning-at-Risk vegetation would improve most rapidly (Table 36) because many of the key components for recovery already exist (i.e., presence of desirable species). Non-functioning B-, C- and E-reaches (Table 36) should realize slower but steady improvement of thermal conditions, however, some of these may still need active restoration activities such as riparian planting in reaches where hardwoods are not yet established.

Considerable measurable improvement (i.e., >5ºF mean annual temperature) in stream temperatures are unlikely in the short-term (<15 years) because riparian vegetation would exhibit limited expansion during this time, but would be expected in the long-term (>15 years). Extensive riparian vegetation must be established throughout the entire reach to be effective at reducing overall stream temperatures. Measurable improvement in stream temperatures are unlikely in the short-term (<15 years) Climatic variability (i.e., annual temperature variation and global warming) is still expected to play the most important role in dictating short- and long-term stream temperatures, however.

The section on Impacts to Riparian and Upland Vegetation (Issue #1) describes the direct and indirect effects of livestock grazing on riparian and upland vegetation. Under the

proposed standards, livestock would not remove all of the annual growth of herbaceous species and would be moved when their preference shifts to woody vegetation. This would produce year-to-year improvements and accelerate the growth of existing shrubs. Reaches that are browsed heavier than designated monitoring sites would not recover as quickly if greater utilization occurs there. Alternative 2 would yield greater growth, vigor, and expansion of obligate riparian vegetation in wetlands and floodplains each year and shade would slowly expand.

The actual extent of improvement would depend on a variety of local factors such as site capability, departure from historic means, elevation, flow, proximity to spring sources, groundwater interactions, and aspect. In lower gradient E-type reaches sedges are often the dominant potential vegetation and would contribute less to stream shading than willows and alders in A- and B-type streams (Table 36). Narrow, deep streams such as E-types are protected from excessive solar heating by having low width to depth ratios whereas C-types are shallower and more dependent on topographic and vegetative shade.

Cumulative Effects: The past, present, and reasonably foreseeable activities listed under Alternative 1 are all applicable here as well. Shade conditions and stream temperatures would still be expected to improve slowly under this alternative, albeit at a slower rate than in the absence of livestock simply because they would remove some amount of vegetation.

Past projects that established or enhanced riparian vegetation such as planting, headcut stabilization and exclosures (Table 25) would slowly move these reaches toward desired future conditions under Alternative 2. Any browsing of herbaceous plants and shrubs that exceeds a plant's annual growth would, however, reduce their vigor and effectiveness at creating shade in both the short- and long-term (<>15 years).

Similarly, future riparian planting and vegetation enhancement activities associated with the Deep Creek Vegetation Management and Restoration Projects (2004a,b) would improve shade conditions and slowly decrease stream temperatures in both the short- (<15 years) and long-term (>15years). Exclosures and stand protection would also be necessary to protect plantings from livestock browsing under this alternative. Prescribed burning activities associated with the Deep Creek Vegetation Management and in Fort Creek (USDA 1998) have the potential to decrease shade if fire consumes riparian vegetation. Although fire will only be allowed to back into RHCAs, it would still increase forage production and thus desirability to livestock.

Alternative 2 would have beneficial effects to private lands downstream due to improvements in water quality. Colder water in streams of the Westside Allotments Project Area would be delivered downstream and there would primarily benefit salmonid populations. Trout populations are generally very limited at present, primarily due to high water temperatures, but may expand their range if thermal conditions improve. A reduction in suspended sediment would also improve downstream water quality. Benefiting streams that flow off-Forest would include Paulina, Burnt Corral, Indian, Roba, Hewed Log, Dipping Vat, Dry Paulina, Keeton, Fry, Mac, and Fort Creeks, as well as the North Fork Crooked River. It is uncertain how much thermal improvement would occur downstream in the larger, 4th field waterbodies (i.e., upper John Day River, upper Crooked River, and South Fork Beaver Creek) as a result of temperature decreases on the Ochoco NF.

A 2006 Oregon DEQ TMDL will attempt to address the existing condition for all major water quality parameters in the North Fork Crooked River and Deep Creek systems, including temperature, dissolved oxygen, bacteria, sediment, nutrients, and conductivity.

Alternative 3 – Current Allotment Management

Direct and Indirect Effects: As it is currently implemented, Alternative 3 would gradually improve stream temperatures and shade conditions over the long term and eventually meet Riparian Management Objectives from INFISH/PACFISH. (see Table 36) This would apply to all stream types, associated wetlands, and floodplains however, D-, F- and G-channels would remain static or further decline until they are capable of supporting riparian vegetation again as these reaches would be expected to follow a linear process of morphological development, whereby they reshape their pattern, dimension and profile until a new energy balance is achieved (Rosgen 1996; Bengeyfield and Svoboda 1998; Lockwood and Lockwood 1993; Van Haveren and Jackson 1987; Harvey and Watson 1986). Morphologic recovery in these reaches is not likely to occur within a 15 year timeframe. They would also remain degraded or not improve at all in the long-term (>15 years) if additional disturbances begin within the watershed (e.g., new headcuts, excessive sedimentation from occurrences such as landslides).

Although stream temperature was not a criteria used in determining functional class (Appendix C), reaches with Functioning-at-Risk vegetation (see Table 36) would improve slowly if desirable species are already present. Non-functioning reaches (see Table 36) would not likely realize improvement of shade or thermal conditions until active restoration (such as extensive riparian planting and stand protection) takes place.

Considerable measurable improvement (i.e., >5ºF mean annual temperature decrease) in stream temperatures are unlikely in the short-term (<15 years) and would be slow, if occurring at all, in the long-term (>15 years). Extensive riparian vegetation must be established throughout the entire reach before it would be effective at reducing overall stream temperatures. Climatic variability (i.e., annual temperature variation and global warming) is still expected to play the most important role in dictating short- and long-term stream temperatures.

The section on Impacts to Riparian and Upland Vegetation (Issue #1) describes the direct and indirect effects of livestock grazing on riparian and upland vegetation. Under Alternative 3, livestock would continue to remove much of the annual growth of herbaceous species and heavily browse woody vegetation in many reaches including wetlands and floodplains. This would promote negligible growth and expansion of existing shrubs, thereby limiting increases in shade.

Cumulative Effects: The past, present, and reasonably foreseeable activities described under Alternative 1 are all applicable here as well. Shade conditions and stream temperatures would be static or improve only slightly under this alternative, with possible continued degradation in reaches that are receiving especially heavy browsing pressure.

Past projects that established or enhanced riparian vegetation such as planting, headcut stabilization and exclosures would improve slowly under Alternative 3. Any additional browsing of herbaceous plants and shrubs would reduce their vigor and effectiveness at creating shade. Slow increases in shade could occur under this alternative if standards are properly implemented and applied continuously and evenly across the landscape.

Some activities associated with the Deep Creek Vegetation Management and Restoration Projects (2004a,b) will be implemented beginning in summer, 2005 and would hasten improvement in shade conditions. The former project includes 28 miles of riparian planting which would require exclosures or stand protection under this alternative. The Deep Creek Vegetation project also includes prescribed burning activities which have the potential to decrease shade if fire consumes riparian vegetation. Although fire will only be allowed to back into RHCAs, this would still increase forage production and thus desirability to livestock.

Cumulatively, Alternative 3 would have only some minor beneficial effects to private lands downstream due primarily to implementation of previously described restoration activities. Considerable measurable improvement (i.e., >5ºF mean annual temperature decrease) in stream temperatures are unlikely in the short-term (<15 years) and would be slow, if occurring at all, in the long-term (>15 years). Warmer water in streams of the Westside Allotments Project Area would be delivered downstream and would further reduce the already-limited salmonid habitat there over the short term. While no data exists to quantify suspended sediment in these streams, turbidity is believed to be high during flood events. A reduction in suspended sediment (primarily through the implementation of other restoration activities described under Alternative 1, Cumulative Effects) would improve downstream water quality. Benefiting streams that flow off-Forest would include Paulina, Burnt Corral, Indian, Roba, Hewed Log, Dipping Vat, Dry Paulina, Keeton, Fry, Mac, and Fort Creeks, as well as the North Fork Crooked River. It is uncertain how much thermal improvement would occur downstream in the larger, 4th field waterbodies (i.e., upper John Day River, upper Crooked River, and South Fork Beaver Creek) as a result of temperature decreases on the Ochoco NF.

A 2006 Oregon DEQ TMDL will attempt to address the existing condition for all major water quality parameters in the North Fork Crooked River and Deep Creek systems, including temperature, dissolved oxygen, bacteria, sediment, nutrients and conductivity.

Summary: The three alternatives would differently affect shade and stream temperature conditions throughout the project area. First, it must be assumed that any measurable increase or decrease in shade will have a commensurate effect on stream temperatures. Alternative 1 would produce the most rapid improvement in shade and therefore temperature conditions. Alternative 2 would be slower, yet still move toward attainment of DEQ water quality objectives, while Alternative 3 would produce the slowest results and, in some cases, no upward trend within a 15 year period. Under all alternatives, vegetative recovery in D-, F-, and G-type streams would not occur or remain static within a 15 year timeframe or until hydrologic stability returns (see the Fisheries section). In these cases, local stream temperatures would also be unlikely to exhibit any thermal recovery until hydrologic stability is recovered.

In summary, effects to stream temperatures are tiered to effects on shade-producing riparian vegetation. Riparian vegetation helps to maintain stream channel, wetlands, and floodplain stability and thus the effects to temperature would be like those described in the Stream Channel Habitat discussion. In the 2-15 year timeframe, the direction and magnitude of effects would vary by stream type and current condition. A-type streams, wetlands, and associated wetlands and floodplains are largely unaffected by livestock

because vegetation plays only a minor role in maintaining channel stability. B-type streams with their wetlands and floodplains would improve slightly or stay the same when Functioning-at-Risk or Non-functioning in Alternatives 1 and 2, while remaining static under Alternative 3 because of the considerable role vegetation plays in maintaining channel stability. Stability in C- and E-type streams and associated wetlands and floodplains is maintained largely by vegetation and would thus improve most under Alternatives 1 and 2 and less so under Alternative 3. D-, F-, and G-type streams along with their wetlands and floodplains would continue to degrade until they re-achieve equilibrium with their sediment supply and flow, and floodplain and valley. These reaches would require active restoration to fully restore normal stream temperatures. Table 36 describes all of these expected changes to temperature in the 2-15 year (short-term) timeframe. Relative terms (i.e., considerable and minor) are used here since the literature and available models do not afford more specific quantitative predictions. The 2006 Oregon DEQ TMDL process will conduct local modeling to ascertain the empirical potential for some streams of the John Day and Crooked River basins, including a few larger streams within the project area (Bonnie Lamb, *pers. comm*. 04/19/05). Specific changes to vegetation are described under the Riparian and Upland Vegetation Section (Issue #1), as well as Stream Channel Habitat.

Some streams in this area may not naturally (i.e., in the absence of human disturbance) be capable of achieving the DEQ target temperature of 64ºC, particularly those in the Roba Allotment, due to their limited flow and south aspect. It is uncertain what a potential stream temperature thermograph would look like on any stream in the project area, however, expansion of hardwood and herbaceous shade-producing species would greatly improve a stream's ability to mitigate climatic extremes. All streams in the project area are capable of achieving 100% *potential shade* (per LRMP standards), though not solely through implementation of any alternative in this action.

Table 36: Summary of expected temperature trends, by Alternative, from 2006-2021 in streams of the Westside Allotments Project Area (only streams with temperature and/or shade data analyzed).

Stream Name	Stream Type	Alternative 1	Alternative 2	Alternative 3
Burnt Corral	C	↑	↑	↗
Chamberlain	C	↑	↑	↗
Crazy	A, B	↗	→	→
Deep	C	↑	↑	↗
Deep	D	↘	↘	↘
Derr	E	↑	↑	↗
Dipping Vat	C	↑	↑	↗
Dipping Vat	E	↑	↘	↘
Double Corral	C, E	↑	↑	↗
Dry Paulina	B	↗	↗	→
Dry Paulina	E	↗	↘	↘
Fort	A	→	→	→
Fort	B	↗	→	→
Fry	A	→	→	→
Fry	B	↗	→	→
Happy Camp	A	↗	→	→

Happy Camp	B	↗	↗	→
Happy Camp	C, E	↑	↑	↗
Happy Camp	G	↘	↘	↘
Jackson	B	↗	↗	→
Jackson	C, E	↑	↑	↗
Keeton	A	→	→	→
Keeton	B	↗	→	→
Little Summit	A	↗	→	→
Little Summit	B	↗	↗	→
Little Summit	C, E	↑	↑	↗
Little Summit	D, G	↘	↘	↘
Mac	A	→	→	→
Mac	B	↗	→	→
NF Crooked R.	C	↑	↑	↗
Roba	A	→	→	→
Roba	B, C	↗	↗	→
Roba	F, G	↘	↘	↘
Thornton	C, E	↑	↑	↗
Thornton	F, G	↘	↘	↘
Toggle	C, E	↑	↑	↗
Toggle	F, G	↘	↘	↘

Symbols: ↑= significant decrease in mean temperature; ↗= minor decrease in mean temperature; →= no measurable change in temperature; ↘= likely increase in mean temperature

North Fork Crooked Wild and Scenic River

Introduction

The discussion of scenic and botanical values and potential effects uses existing information including: the Ochoco National Forest Land and Resource Management Plan (USFS 1989), Deep Restoration EA (USFS 2004), Deep Creek Watershed Analysis (USFS 1999), Deep Water Quality Restoration Plan (USFS 2001), PACFISH/INFISH (1994/95), North Fork Crooked River Management Plan (USDA 1993), project specific resource reports, agency and scientific studies as well as site specific professional experience and judgment. For a more detailed discussion of the North Fork of the Crooked River Wild and Scenic Rivers and its designated Outstandingly Remarkable Values, refer to the Wild and Scenic River Report in the project record.

Affected Environment

Winward Riparian Plot, North Fork Crooked River, August 28, 2003

On July 22-23, 2004 the National Riparian Service Team (NRST), Ochoco National Forest, and members of the public conducted a riparian Proper Functioning Condition (PFC) assessment. This survey determined that, currently, the portions of Segments two and three located in the Deep Creek Allotment are Functional-at-Risk with an upward trend. Segment Two, within the Big Summit Allotment, is a complex of Properly Functioning, Functioning-at-Risk with an upward trend, and Functioning-at-Risk with a downward trend. The portion that is Functioning-at-Risk with a downward trend has been converted to a riparian pasture and is in its first season, of a minimum of three, of receiving no grazing.

The portions of Segments three and four located within the Roba Allotment are a complex of Properly Functioning and Functional-at-Risk with an upward trend. Segment five, administered by the BLM, was found to be Properly Functioning. Although this Segment received little use (difficult to find and remove stray livestock), the BLM has recently (2005) finished fencing the entire Segment, turning it into a riparian pasture. This will further curtail any stray livestock use. Segment 6, entirely private except for two small parcels of BLM land, was not surveyed; however, old BLM monitoring records and more recent casual observations by a BLM Rangeland Management Specialist indicate that riparian areas are mostly fenced and appear to be stable (attempts to contact the manager of the Les Schwab ranch were unsuccessful). The survey found that riparian-wetland vegetation is present and expanding under current grazing management. Recommendations include the need for more patches of mature willow and alder to help catch and retain large woody debris. The 2004 PFC assessment taken in August 2003 substantiates riparian plot data (Winward #14) with high mid seral vegetation, approaching late seral, with good streambank stability. This study also concluded that while both willow and alder were present, the North Fork was missing a mature component of woody species on the survey site. Mature willow, alder, and cottonwood were observed both upstream and downstream of the survey site. Many of the streams in the Westside Allotments Project Area as well as adjacent areas benefited by the presence of beaver, which helped reduce stream velocity, increase sediment deposition, raise water tables, and promote riparian vegetation colonization and habitat expansion. After the beaver were removed in the 1800s, riparian areas became increasingly susceptible to vegetation and soil disturbances from other management activities that have promoted degraded resource conditions.

Since 2001, current livestock management has rested portions of Segments three (1191.14 acres) and four (375.71 acres) in the Riparian Pasture of the Roba Allotment. This action was taken in response to a noxious weed infestation on the Roba Allotment. Late season unauthorized livestock use originating off the Paulina Ranger District has occurred on an annual basis. In 1996-97, the Wild and Scenic portion of the Roba Allotment was fenced, creating a riparian pasture. This allowed for better control of livestock use and increasing healthier vegetation in the Riparian Pasture. A small portion of Segment two (30.08 acres) is located in the South Pasture of the Deep Creek Allotment and is used on a deferred rotation grazing system.

Environmental Consequences

Alternative 1 – No Action/No Grazing

Under the No Action alternative, all Term Grazing Permits would be cancelled within two years of implementation of the decision. The requirement to implement this decision no sooner than two years following the project decision is pursuant to Forest Service Handbook (FSH) 2209.13 part 16.24, and the Code of Federal Regulations (36CFR 222.4 (4) (1). Maintenance of range developments on the allotments would no longer be the responsibility of the permittees. Subsequent decisions would need to be made regarding retention and maintenance of any improvements (such as water developments and fences).

Direct and Indirect Effects: This alternative would eliminate authorized livestock grazing from the portions of Segments two through four located on the Paulina Ranger District as well as the entire Westside Allotments Project Area. Implementation of this alternative

would provide for the most widespread and fastest improvements to vegetation conditions in the Westside Allotments Project Area, including Paulina Ranger District's portion of Segments two through four. There would be no direct effects to vegetation and soils from permitted livestock grazing, trampling, trailing, or deposition of fecal material. There would be no direct impact from permitted livestock on stream banks in those areas accessible to livestock. Grazing of riparian shrubs by permitted livestock would not occur. Removal of livestock as a direct disturbance to riparian systems would facilitate a more rapid increase in the amount and diversity of riparian grasses, sedges, rushes, and woody species than is presently occurring within the Westside Allotments Project Area.

Woody species would benefit in both the short (0-15 years) and long-terms (15+ years) from less browsing pressure from livestock and would likely expand their canopy cover providing increased amounts of stream shading. In areas capable of supporting woody species such as willows and alders, increased amounts and age classes of these deeply rooted plants would help stabilize stream banks, catch large woody debris, and filter sediment, all helping to increase water quality. It is expected that increases in woody species numbers, age classes, and distribution would only occur in areas with suitable soil conditions. Aspen stands would benefit by increased numbers of young plants resulting from the elimination of browsing pressure by livestock and would potentially benefit in the short-term (0-15 years).

Studies of livestock exclusion from riparian areas have found that recovery of riparian vegetation occurred in four to eight years, depending on site location (Skovlin 1984). Rates of recovery would be expected to vary across Segments two through four, with previously altered sites, presently lacking a riparian vegetation component, taking longer to fully recover. The return to original conditions on some sites would be very slow or non-existent (Laycock 1989, Winward 1991). In the long-term (15+ years), it would be expected that continued improvement in riparian vegetation in the entire Westside Allotments Project Area would allow for increased amounts of large woody debris and sediment deposition. This would eventually allow the stream channel to narrow and deepen, further enhancing the Outstandingly Remarkable Values **(**ORVs) on Paulina Ranger District's portion of Segments two through four, and be a positive influence on Segments five and six.

Effects to Specific Outstandingly Remarkable Values

Scenic: Currently, vegetation is in fair to good condition for the majority of portions of Segments two through four located on the Paulina Ranger District. Increases in the amount and types of vegetation along with a decrease in the amount of soil disturbance would provide an increase in scenic values for Segments two through four. These improved resource conditions upstream would create a positive influence for conditions downstream (Segments five and six).

Recreation: Recreational opportunities like dispersed camping, hiking, mountain biking, wildlife viewing, fishing, hunting, swimming, backpacking, nature study, and horseback riding would benefit from the removal of livestock on Segment four. People recreating would not encounter livestock or the disturbances associated with livestock grazing, such as altering native plant communities, trampling vegetation, exposing mineral soils, and depositing fecal material.

Botanical Values: Peck's mariposa lily (*Calochortus longebarbatus* var. *peckii*) populations in Segments two through five would benefit from removing livestock, especially Segments two through four, because of the lack of direct damage caused by grazing and hoof action. Old growth Ponderosa pine stands are not expected to be measurably affected by the removal of livestock.

Native Riparian Conditions: Native riparian plant communities in Segments four and five would benefit from the removal of livestock and the associated grazing pressures, especially in Segment 4, because of the lack of direct impacts. Plant densities and species composition would continue to move toward more stable and late serial community types, eventually providing habitat conditions that would afford the opportunity for expansion of these native plant communities within Segment four and downstream in Segment five.

Wild Life (Bald Eagle Winter Roost Site): Winter roosting sites in Segments five and six are not expected to be affected to any great extent by the removal of livestock immediately upstream in Segments two though four or from the entire Westside Allotments Project Area. There is the possibility that with improved vegetation and water quality more food will be available.

Alternative 2 – Proposed Action

The Proposed Action would authorize livestock grazing in all five allotments including Segment two (South Pasture of the Deep Creek Allotment) and Segments three and four (Riparian Pasture of the Roba Allotment) of the North Fork Crooked Wild and Scenic River. New grazing management standards would use an adaptive management approach. Grazing management standards would be implemented based on an assessment of the level at which resources within pastures or allotments are functioning. A system is functioning when the soil of the area and the vegetation that it supports are in satisfactory condition; water from precipitation and runoff is effectively absorbed, routed, and retained longer within the watershed; erosion occurs slowly, is limited in scope, and is filtered by landform and vegetation; and systems can withstand and recover quickly from disturbance events. The allotments would be monitored throughout the grazing season for stubble height, streambank alteration, and woody species utilization. Annual Operating Instructions (numbers and seasons of use) would be adjusted in response to the previous year's monitoring results and expected climatic conditions for the upcoming grazing season. Allotments failing to meet standards would have annual adjustments in livestock numbers, season of use, and non-use on pastures with serious noxious weed concerns

Direct and Indirect Effects: Implementation of the Proposed Action is expected to result in improved riparian and upland vegetation conditions on the portions of Segment two through four along the North Fork Crooked Wild and Scenic River within the Paulina Ranger District. Reductions in the duration of livestock use, through implementation of the proposed standards, are expected to improve riparian conditions by reducing the amount of time riparian and upland areas are exposed to livestock grazing on all of the Westside Allotments. Under Alternative 2, the Roba Allotment would be rested for a period of three years in order to treat noxious weeds. This treatment would help prevent their spread into the riparian pasture and limit the detrimental affect on the Outstandingly Remarkable

Values (ORV). After the three year rest period, proposed grazing standards specify early season livestock use between May 15 and June 21, with a rest period every other year for the Riparian Pasture of the Roba Allotment. Proposals to reduce levels of forage utilization by livestock would benefit both the riparian vegetation and soils in Segments three and four (Riparian Pasture) and Segment two (South Pasture). This low intensity grazing by livestock will help improve both riparian vegetation and the soil resource, thereby enhancing the ORVs in Segments two through four. The upward trend on vegetation and soils in Segments three and four would continue in the long-term (15+ years). Segment two would likely show improvement in both the short (0-15 years) and long-terms (15+ years). These benefits could likely carry over into Segments five and six.

Direct impacts from livestock grazing, that includes riparian and upland forage removal, soil disturbance resulting from hoof action, and deposition of fecal material, would occur for a short duration. The change in management standards, outlined in the Proposed Action, would provide willows and alders with a greater opportunity to recover from the impacts of annual livestock grazing. Woody species would benefit in both the short (0-15 years) and long-terms (15+ years) from less browsing pressure and would likely expand their canopy cover, providing increased amounts of stream shading. In areas capable of supporting woody species, such as willows and alders, increased amounts and age classes of these deeply rooted plants would help stabilize stream banks, catch large woody debris, and filter sediment helping to increase water quality. It is expected that increases in woody species numbers, age classes, and distribution would only occur in areas with suitable soil conditions. Aspen stands would benefit by increased numbers of young plants resulting from less browsing pressure by livestock and would potentially benefit in the short-term (0-15 years).

There would be direct impacts from permitted livestock on stream banks in those areas accessible to livestock. The proposed standards meet Interim Strategies for Management of Inland Fishes of the Columbia River Basin (INFISH) standards for stream bank alteration and allow vegetation to improve at a more normal rate. Full implementation of utilization, stubble height, and monitoring standards in the Proposed Action, outlined in Chapter Two, would afford improvement of riparian vegetation and stream bank stability. In the long-term (15+ years), it would be expected that continued improvement in riparian vegetation would allow for increased amounts of large woody debris and sediment deposition. This would eventually allow the stream channel to narrow and deepen. Upland vegetation would benefit from low levels of utilization and would increase individual plant health and vigor.

Effects to Specific Outstandingly Remarkable Values

It is expected that with more restrictive utilization standards, early season, short duration grazing would result in similar resource responses as the No Action Alternative. In turn, the effects on the Outstandingly Remarkable Values (ORV) would be similar within Segments three and four. With just a small piece of Segment two (30 acres) within the project area, although the more restrictive utilization would result in improving resource conditions, there would be little to no influence on the ORVs.

Scenic: Currently, vegetation is in fair to good condition for the majority of portions of Segments two through four located within the Paulina Ranger District. Increases in the

amount and types of vegetation along with a decrease in the amount of soil disturbance would further provide a positive increase in the scenic values for Segments two through six. Proposed livestock use is early season short duration, which would result in continued improvements in vegetation and soil conditions, having a positive influence on the scenic values.

Recreation: Recreational opportunities, like dispersed camping, hiking, mountain biking, wildlife viewing, fishing, hunting, swimming, backpacking, nature study, and horseback riding on Segment four, and to a lesser extent, Segment five, should be enhanced due to the improved riparian conditions by reducing the amount of time riparian and upland areas are exposed to livestock grazing. People recreating would encounter livestock on a limited basis, as grazing use under Alternative 2 would be reduced to early season short duration with rest every other year in the Riparian Pasture of the Roba Allotment.

Botanical Values: Peck's mariposa lily (*Calochortus longebarbatus* var. *peckii*) populations in Segments two through five would benefit from the reduction in livestock use immediately upstream in Segments two through four and from the entire Westside Allotments Project area. Old growth Ponderosa pine stands are not expected to be measurably affected by the reductions in livestock use.

Native Riparian Conditions: Native riparian plant communities in Segments four and five would benefit from the improvement in riparian conditions due to reducing the amount of time riparian and upland areas are exposed to livestock grazing on all of the Westside Allotments. Plant densities and species composition would continue to move toward more stable and late serial community types, eventually providing habitat conditions that would afford the opportunity for expansion of these native plant communities within Segment four and downstream in Segment five.

Wild Life (Bald Eagle Winter Roost Site): As with Alternative 1, winter roosting sites in Segments five and six are not expected to be affected to any great extent by the removal of livestock immediately upstream in Segments two through four or from the entire Westside Allotments Project Area. There is the possibility that, with improved vegetation and water quality, more food will be available.

Alternative 3 – Current Allotment Management

Alternative 3 reflects current management. The allotments would be managed according to the standards and criteria established in the LRMP, Allotment Management Plan, Annual Operating Instructions, and the Term Grazing Permit. The allotments would be monitored throughout the grazing season for stubble height, streambank alteration, and woody species utilization. Annual Operating Instructions (numbers and seasons of use) would be adjusted in response to the previous year's monitoring results and expected climatic conditions for the upcoming grazing season. Allotments failing to meet standards would have annual adjustments in livestock numbers, season of use, and non-use on pastures with serious noxious weed concerns.

Direct and Indirect Effects: Grazing management in the Riparian Pasture of the Roba Allotment has been adequate in responding to changes in environmental conditions on a year-to-year basis. The three-year rest period that has taken place under current management standards has allowed for the improvement of riparian vegetation and soil

stability. This is supported by the 2003 riparian plot data and 2004 Properly Functioning Condition (PFC) assessment (available in the project record for this analysis, Paulina Ranger District). It is expected that resumption of a normal grazing schedule in the Riparian Pasture of the Roba Allotment would result in less vegetation and increased levels of soil disturbance. Under Alternative 3, the Roba Allotment would continue to be treated for noxious weeds. This treatment would help prevent their spread, but continued use by livestock could help spread these weeds into the Riparian Pasture, having a detrimental affect on the ORVs. Current grazing management standards have resulted in less vegetation and higher levels of soil disturbance in the portion of Segment two located in the South Pasture of the Deep Creek Allotment.

Direct impacts from livestock grazing at current levels, such as riparian and upland forage removal, soil disturbance resulting from hoof action, and deposition of fecal material would continue to occur. There would be direct impacts from permitted livestock on streambanks in those areas accessible to livestock. The current management standards meet Interim Strategies for Management of Inland Fish of the Columbia River Basin (INFISH) standards for streambank alteration. Current management standards as implemented have not allowed vegetation or soil recovery on the Deep Creek portion of Segment two, but vegetation and soils along Segments three and four in the Roba Allotment have shown improvement with increased amounts and types of riparian vegetation. This is a direct result of the three years of rest that has taken place. This has allowed for improved environmental conditions, including ORVs in the Roba Allotment. As demonstrated by the improvements that have occurred, resumption of grazing would have some downward pressure on the rate of improvement to riparian dependent resources.

Effects to Specific Outstandingly Remarkable Values

Except for the slightly higher utilization standards, grazing will be similar to Alternative 2. This should result in improving resource conditions similar to Alternative 2, albeit slower. In turn, the positive influence on the ORVs would also be slower.

Scenic: Currently, vegetation is in fair to good condition for the majority of portions of Segments two through four located on the Paulina Ranger District. Increases in the amount and types of vegetation along with a decrease in the amount of soil disturbance would further provide a positive increase in the scenic values for Segments two through four. These positive affects would likely cross over into Segments five and six. Current livestock use is early season short duration, which has resulted in vegetation and soil conditions that have a positive influence on the scenic values.

Recreation: Recreational opportunities, such as dispersed camping, hiking, mountain biking, wildlife viewing, fishing, hunting, swimming, backpacking, nature study, and horseback riding on Segment four, and to a lesser extent, Segment five, should be enhanced due to improved riparian conditions by reducing the amount of time riparian and upland areas are exposed to livestock grazing. People recreating would encounter livestock on a limited basis, as grazing under Alternative 3 would be limited to early season short duration use in the Riparian Pasture of the Roba Allotment.

Botanical Values: Peck's mariposa lily (*Calochortus longebarbatus* var. *peckii*) populations in Segments two through five would benefit from the reduction in livestock use

immediately upstream in Segments two through four and from the entire Westside Allotments Project Area. Old growth Ponderosa pine stands are not expected to be measurably affected by the reductions in livestock use.

Native Riparian Conditions: Native riparian plant communities in Segments four and five would benefit from the improvement in riparian conditions due to reducing the amount of time riparian and upland areas are exposed to livestock grazing on all of the Westside Allotments. Plant densities and species composition would continue to move toward more stable and late serial community types, eventually providing habitat conditions that would afford the opportunity for expansion of these native plant communities within Segment four and downstream in Segment five.

Wild Life (Bald Eagle Winter Roost Site): As with Alternative 1, winter roosting sites in Segments five and six are not expected to be affected to any great extent by the removal of livestock immediately upstream in Segments two through four or from the entire Westside Allotments Project Area. There is the possibility, that with improved vegetation and water quality, more food will be available.

Effects to Beaver Populations Common to all Alternatives

Increased amounts of woody vegetation resulting from the elimination or reduction in livestock grazing would likely lead to increased numbers of beaver along Segments two through six. Expansion into Segment one would be limited or nonexistent. Natural hydrologic processes produce changes that are increased by the presence of beaver. As beaver build dams, sediment is deposited in the resulting ponds, which can raise the water table. This expands the riparian zone and there is more opportunity for riparian grasses, sedges, rushes, and shrubs to colonize and expand. A return towards the historical population of beaver would benefit the Outstandingly Remarkable Values (ORV) of the North Fork Crooked Wild and Scenic River, located in the Westside Allotments Project Area by helping to stabilize stream flows towards a more natural level. Except for the slightly higher utilization standards, grazing will be similar to Alternative 2. This should result in improving resource conditions similar to Alternatives 1 and 2, albeit slower. In turn, the positive influence on the ORVs would also be slower.

- *Scenic:* A return towards the historical population of beaver would have a positive affect on the scenic values from increased amounts of riparian grasses, sedges, rushes, and shrubs.
- *Recreation:* A return towards the historical population of beaver would have a positive affect on recreational opportunities like dispersed camping, hiking, mountain biking, wildlife viewing, fishing, hunting, swimming, backpacking, nature study, and horseback riding on Segments four and five. People recreating would have more opportunities for wildlife viewing and photography.
- *Botanical Values:* A return towards the historical population of beaver could displace some populations of Peck's mariposa lily (*Calochortus longebarbatus* var. *peckii*) as riparian areas expand into the dryer meadow sites. Old growth Ponderosa pine stands are not expected to be affected by a return towards the historical populations of beaver.

- *Native Riparian Conditions:* A return towards the historical population of beaver could have some affect on native riparian plant communities in Segments four and five, especially the woody species as they would likely be a preferred food source.
- *Wild Life (Bald Eagle Winter Roost Site):* A return towards the historical population of beaver would not have a measurable affect on winter roosting sites in Segments five and six.

Cumulative Effects to Common to All Alternatives: Past and present management activities, such as domestic livestock grazing (sheep and livestock), timber harvest, fire suppression and prescribed burning, road building and maintenance, recreation, and special uses, have contributed to degraded riparian and upland vegetation conditions. These activities have occurred in the project area and on adjoining National Forest, BLM-administered, and private lands. Of particular note is the fact that the Big Summit Prairie, which is just upstream from Segment two, has been channeled and much of the water impounded, changing how the river functions downstream in Segments two through six.

The following discussion of past, present, and reasonably foreseeable future activities (authorized/unauthorized livestock grazing, vegetation management/timber harvest, noxious weed treatment, restoration projects, road management activities, affects to beaver populations, recreational uses, and increases in fine fuels) relate to all alternatives and are specific to the Outstandingly Remarkable Values of the North Fork Crooked River Wild and Scenic River.

Authorized/Unauthorized Livestock Grazing: Past grazing practices on what is now the Ochoco National Forest allowed unrestricted grazing, mostly by large numbers of sheep, to occur between 1880 and 1907. This resulted in changes in vegetation communities and soils that resulted in degraded riparian and upland habitat. Changes in livestock grazing practices after the creation of the Ochoco National Forest has allowed some improvement in vegetation condition, but historic impacts can still be seen and continue to contribute to current vegetation conditions on all Segments of the North Fork Crooked Wild and Scenic River. Livestock grazing occurring along and in areas adjacent to the North Fork Crooked Wild and Scenic River has the potential to affect the ORVs by altering native plant communities, trampling vegetation, exposing mineral soils, and depositing fecal material.

The livestock use upstream on the Big Summit Prairie has and continues to influence water quality and riparian vegetation by increasing the amount of suspended sediment and water velocity during periods of high runoff events. The effects of the Prairie being channeled, combined with heavy grazing pressure, is likely still influencing hydrologic and riparian vegetation conditions downstream, but the exact nature of the influence is unknown. With the changes in management in the Big Summit Allotment (upstream in Segment two) and the fact that the most of the Segment is a complex of Properly Functioning and Functioning-at-Risk with an upward trend, should help minimize these influences.

It is likely that late-season unauthorized livestock use in portions of Segments three and four would continue to occur from neighboring allotments or private lands. Unauthorized livestock use has the potential to slow the recovery of vegetation conditions by consuming the vegetation after the growing season, which reduces the health and vigor of the plant. If past levels of unauthorized use were to continue (averages approximately 30-40 head) along with the duration of use (approximately 1-1.5 weeks), this would ultimately have a

detrimental affect on the ORVs. This use is expected to be limited, as grazing management strategies have been implemented to detect and remove unauthorized livestock. As a result, there should be no adverse impacts on scenic, recreational and bald eagle ORVs, and potentially a small impact on botanical and native riparian ORVs from this activity. The impacts from this would not result in measurable differences between the alternatives.

Vegetation Management/Timber Harvest: Past timber harvest activities include Deep Salvage, 1995 (900 acres harvested); Summit timber Sale, 1996 (2,040 acres harvested); Fryton/Rainier/Barn Timber Sale, 1992 to present (1,739 acres harvested); and others. Harvest activities have resulted in changes in upstream vegetation and soil conditions that have affected the water quality and riparian vegetation on all downstream Segments of the North Fork Crooked Wild and Scenic River by increasing the amount of suspended sediment and water velocity during periods of high runoff events, all of which have influenced the resource conditions, especially as they relate to the Botanical and Native Riparian ORVs, which are not currently at their potential.

The only future vegetation management project (Deep Vegetation Management Project) includes the following activities: timber harvest (6,300 acres); prescribed burning (8,500 acres); and road reconstruction/construction (25 miles). Changes in upstream vegetation and soil conditions can affect the water quality and riparian vegetation on all downstream Segments of the North Fork Crooked Wild and Scenic River by increasing the amount of suspended sediment and water velocity during periods of high runoff events. This could potentially affect the ORVs, especially the two directly related to riparian conditions. Although there is a short-term risk of these events happening, within ten years it is expected that these activities will result in improved hydrological function above the Wild and Scenic River, therefore conditions within the river corridor would also improve. Again, with only minor management differences between the alternatives there would be no measurable differences between the alternatives.

Noxious Weed Treatment: Since 2002, the Roba Allotment has been treated for noxious weeds both manually and with herbicide. To date, 1,687 acres have been treated. The treatment strategy will be continued and further covered in the on-going planning effort for the Deschutes-Ochoco Invasive Plant EIS. These weed treatments have the potential to limit the spread of noxious weeds on all Segments of the North Fork Crooked Wild and Scenic River, thereby protecting the ORVs. These treatments are expected to eventually control the weed populations and limit the likelihood of their spreading into the Wild and Scenic Corridor. Alternative 3, with resumption of grazing in the Roba Allotment, and within the Riparian Pasture (Segments three and four), will limit the effectiveness of these treatments, placing the ORVs at some risk of being impacted by the spread of these weeds. Alternative 2 would continue to rest the Roba Allotment for an additional three years while aggressive weed treatment continues, resulting in little risk to the ORVs. Alternative 1, with no livestock grazing would result in the highest protection, however, as with the other two alternatives there are other vectors (vehicles, other animals, etc), that will inevitable spread weeds into the river corridor, placing the ORVs at risk. As with the Forest in general, future weed sites will need to be quickly identified and treated.

Restoration Projects: Activities proposed under the Deep Creek Watershed Restoration Project have the potential to affect vegetation and soils from such projects as: large wood placement, cutbank revetment, pool habitat restoration, riparian exclosures, spring

developments, and stream channel reconstruction. In the long-term (15+ years), these restoration activities would potentially improve both vegetation and soils by repairing headcuts, stabilizing stream banks, and decommissioning roads, ultimately improving overall watershed health. This would prove beneficial to the ORVs in Segments two through six of the North Fork Crooked Wild and Scenic River. It is expected that there would be little differences between alternatives.

Road Management Activities: Past and future road construction and yearly maintenance would continue to alter natural drainage patterns. This has the potential to affect riparian vegetation and its habitat by limiting floodplain interaction and thereby its function. Past projects that included road construction are: Summit Timber Sale, 1996 (6.0 miles); Deep Salvage, 1995 (3.0 miles); Dippy Beaver, 1996 (3.7 miles); and Fryton/Barn, 1992 to present (15.8 miles). Future projects include the Deep Creek Vegetation Project (with a total of 25 miles of road construction and reconstruction, all of which are designed to improve hydrologic functions). The proposed road decommissioning projects in the Deep Creek Watershed Restoration Project and North Fork Crooked River Management Plan would also improve hydrologic functions, thus improving riparian vegetation and its habitat in the Deep Creek Watershed and the North Fork Crooked Wild and Scenic River. Again, it is not expected that there would be measurable differences on the ORVs between the Alternatives.

Summary: All of the alternatives cannot be expected to fully meet the resource objectives of the Wild and Scenic River Management Plan. Impacts from past, present and future management activities would continue to or have the potential to impact the ORVs on all Segments of the North Fork Crooked Wild and Scenic River. Alternative 1 is inline with and meets Forest Plan Standards and Guidelines, but would not meet the Purpose and Need outlined in Chapter One. Alternative 1 would potentially improve the designated Outstandingly Remarkable Values (ORV) in the project area slightly faster that Alternatives 2 and 3, and meet the Desired Conditions for the Wild and Scenic River corridor outlined in Chapter One.

Alternative 2 would improve riparian and upland vegetation conditions and the designated Outstandingly Remarkable Values (ORV) of the North Fork Crooked Wild and Scenic River. These improvements would likely occur at a slightly slower rate than Alternative 1, but the differences should not be perceptible. The proposed management standards, which meet multiple use objectives, are in line with Forest Plan Standards and Guidelines and the North Fork Crooked River Management Plan. Alternative 2 would lead to resource conditions that meet the Desired Conditions for the Wild and Scenic River Corridor outlined in Chapter One.

Alternative 3 would improve riparian and upland vegetation conditions and the designated Outstandingly Remarkable Values (ORV. These improvements would likely occur at a slower rate than Alternatives 1 and 2. Current management standards, which meet multiple use objectives, are inline with Forest Plan Standards and Guidelines and the North Fork Crooked River Management Plan. Alternative 3 would lead to resource conditions that meet the Desired Conditions for the Wild and Scenic River corridor outlined in Chapter One.

Additional Disclosures

Tribal Interest

Members of the Confederated Tribes of the Warm Springs Reservation of Oregon continue to use the Ochoco uplands and hold off-Reservation treaty rights for fishing, hunting, gathering plants, and pasturing livestock under the Treaty with the Tribes of Middle Oregon of 1855. Members of the Confederated Tribes of the Warm Springs, Bums Paiute, Umatilla, and Klamath Tribes use a wide variety of plant species that can be found within the project area. All alternatives would continue to provide for the rights afforded to tribal members for the taking of fish, hunting, gathering plants, and pasturing livestock on open and unclaimed land.

Environmental Justice

The population, as of 2000, for rural Crook and Wheeler Counties was 8,892 and 1,547, respectively (Economic Profile Systems – Community, www.sonoran.org). Since 1990, Crook and Wheeler Counties have seen a county-wide population increase of 36% and 11%, respectively. The population by race, as of 2000, for rural Crook and Wheeler Counties is displayed in Table 37 and 38. Analysis of census data for 2000 in rural Crook and Wheeler Counties indicated that rural Crook County has a population that is 95.2% white and rural Wheeler County has a population that is 93.3% white.

Table 37: Total Population by Race for Rural Crook County, Oregon

Race	Number of Individuals	Percent of Population
American Indian & Alaska Native	102	1.1%
Asian	25	0.3%
Black or African American	7	0.1%
Hispanic or Latino	250	2.8%
Native Hawaiian & Other Pacific Islander	1	0.0%
Two or more races	45	0.5%
White	8,462	95.2%
Total	8,892	100%

Table 38: Total Population by Race for Rural Wheeler County, Oregon

Race	Number of Individuals	Percent of Population
American Indian & Alaska Native	13	0.8%
Asian	4	0.3%
Black or African American	1	0.1%
Hispanic or Latino	79	5.1%
Native Hawaiian & Other Pacific Islander	1	0.1%
Two or more races	5	0.3%
White	1,444	93.3%
Total	1,547	100%

Executive Order (E.O.) 12898 directs each Federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionably high

and adverse human health or environmental effects on minority populations and low-income populations from its programs, policies, and activities (E.O. 1298, 1-101).

With the low proportion of a minority population in rural Crook and Wheeler Counties, no disproportionately adverse effects are expected with the implementation of the alternatives. According to the analysis of the Economic Profile Systems – Community data (www.sonoran.org), 60% of the population in rural Crook County and 72% of the population in rural Wheeler County annually earns less than $30,000. The poverty levels, as of 1999, were 10% for rural Crook County and 16% for rural Wheeler County, compared to 12.4% for the United States and 11.6% for the state of Oregon. The environmental effects described in this analysis are expected to be minimal and should not have a disproportionate effect on minority or low-income populations.

Civil Rights, Women, and Minorities

There are no anticipated effects to these groups from implementation of the alternatives. To the greatest extent possible, all members of the population of these groups have been provided the opportunity to comment before decisions are rendered on proposals and activities that may potentially affect them.

Prime Farmland, Rangeland, Forestlands

No prime farmlands, rangelands, or forestlands have been identified with the project area. Therefore, there would be no effect to these resources through implementation of the alternatives considered in this analysis.

Wetlands and Floodplains

Executive Orders 11988 and 11990 direct Federal agencies to avoid, to the extent possible, both short-term and long-term adverse impacts associated with the modifications of floodplains and wetlands. Alternatives 1 and 2 would protect these resources and conform to these Federal regulations. Alternatives 1 (EA, pages 172-173 and 178-179) and 2 EA, page 175 and 178-179) would improve wetlands and floodplains over time. Short-term improvements would be limited to stream types A, B, C and E. Longer term improvements would occur on stream types F and G due to the need for these channels to achieve equilibrium before improvement starts. However, Alternatives 1 and 2 would provide for these channels and their associated wetlands and floodplains to improve in the long-term due to either not grazing or changes in grazing management (303 (d) Listed Streams section). Alternative 3 (EA, page 177-179) would adversely affect wetlands and floodplains with no changes in management from what is currently being implemented. Degradation of these areas would continue at the existing rates and recovery, if any, would be slow, and only in limited areas.

Park Lands, Wild and Scenic Rivers, and Ecologically Critical Areas

There are no designated roadless areas or parklands existing within the project area. The effects to the North Fork Crooked River Wild and Scenic River are discussed on pages 183 to 193 of the EA.

CHAPTER FOUR: CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and the public during the development of this environmental assessment:

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Appendix A

History of the Allotments

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History of the Allotments

Past grazing practices allowed unrestricted livestock grazing to occur starting in the 1880s until 1906, when the Blue Mountain and Maury Mountain Forest Reserves were established. These grazing practices contributed to resource degradation. Much of the soils in riparian areas have been lost, changing the character, structure, and productivity of riparian zones and stream courses. Sediment has moved and continues to move from these areas above natural rates. Nonnative grass and forbs species occur in or dominate many of these areas. Nonnative species invade disturbed sites when less resilient native plant species decline under grazing pressure. These changes in species composition and structure degrade the quality of riparian habitats, reducing effective ground cover and rooting depths. Many native shrub communities along streams have been degraded and declined in distribution. Since regulating livestock grazing, many of the riparian and stream channel conditions have shown improvement.

Deep Creek Allotment

The first bands of sheep were brought into the Deep Creek area in 1882. The present boundaries of the Deep Creek Allotment were established in 1948 and included parts of the old Buck Hollow, Big Springs, Jackson Creek, and the old Deep Creek Allotments. The allotment was fenced in 1962 and grazing use was changed from sheep to cattle. Since 1995, the Deep Creek and Roba Allotments have been managed as one allotment.

Derr Allotment

It is thought that domestic livestock grazing began in the Derr Allotment area in 1882, when the father of George S. Donnelly brought a band of sheep into the forest via Buck Point. It is probable that heavy unrestricted use started shortly after that and continued, at least until the Blue Mountain Forest Reserve was created in 1907. The boundaries of the present allotment have changed several times in the past years and district records do not give an accurate history of permitted numbers or allotment size before 1945. In 1951, grazing use was changed from sheep to cattle.

Happy Allotment

The Happy Allotment was part of the old Badger Allotment, which was included in the Big Summit District. Sheep and cattle grazed the area with the Summit Road Sheep Driveway being used until 1930. In 1922, 1323 head of cattle were grazed in the allotment with this number decreasing to 638 head by 1959. An Allotment Management Plan was completed in 1962 and set up a three-pasture deferred rotation grazing system with the East and West pastures alternating and the North Pasture being used last. This rotation is still used today in order to meet PACFISH standards that restrict the use of the North Pasture until after July 15 each year.

Little Summit Allotment

Domestic livestock grazing began in the Little Summit area about 1885, when it was used for summering bands of sheep. The Little Summit Sheep Allotment was formed when divisions of the Deschutes National Forest was renamed the Ochoco National Forest in 1911. In 1936, the allotment consisted of 5,140 acres of land administered by the Forest

Service and 480 aces of private land and remained so until 1944. In 1944, part of the old Toggle Meadow and Jackson Creek Allotments were added to the existing Little Summit Allotment. In 1963, grazing use was changed from sheep to cattle.

Roba Allotment

The Roba Allotment was established in 1957, out of the western section of the old Beaver Creek Allotment. During the early 1900's before the construction of boundary fences, this range was freely grazed by cattle from early spring to late fall. This lack of control on numbers or season of use affected range conditions. Since 1995, the Deep Creek and Roba Allotments have been managed as one allotment. A Riparian Pasture fence along the North Fork Crooked River was completed in 1998 to increase the control of livestock utilization in riparian areas along the river. This action was intended to achieve goals identified in the North Fork Crooked River Wild and Scenic Management Plan. The Riparian and West Pastures were rested in 2002, 2003, and 2004 due to a noxious weed infestation.

David Palmer

Range Specialist

Paulina Ranger District

July, 2005

Appendix B

Glossary of Acronyms, Abbreviations, and Terms

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Allotment - A rangeland and/or forestland area designated for use by a prescribed number and kind of livestock under one plan of management.

Alternative - In an EA/EIS, one of a number of possible options for responding to the purpose of and need for action.

Animal Month (AM) - One month's use and occupancy of the range by one animal. This phrase is synonymous with Head Month, which is used for billing purposes.

Allotment Management Plan (AMP) - A livestock grazing management plan dealing with a specific unit of rangeland and based on multiple use resource management objectives. The AMP considers livestock grazing in relation to other uses of rangelands and in relation to renewable resources. An AMP establishes the season of use, number of livestock permitted, rangeland improvements needed, and monitoring practices.

Annual Operating Instructions (AOI) - Document that specifies the current year's grazing program, including livestock numbers, season of use, pasture rotation, utilization standards, monitoring and specific instructions to the permittee.

Annual Plant - A plant that completes its life cycle and dies in one year or less.

Available Forage - Forage that can be grazed and still allow sustained forage production on rangeland. Available forage may or may not be authorized for grazing.

AUM - Animal unit month; based on the amount of forage required by an animal unit (one cow) for one month (26 pounds dry matter per day, LRMP).

BA - Biological Assessment

Bankfull – A geomorphological term that refers to the discharge at which most channel maintenance occurs and the common physical stream characteristics are formed; also the stage at which water fills the channel and begins to overflow onto a floodplain.

BE - Biological Evaluation

Best Management Practices (BMPs) - Practices designed to prevent or reduce water pollution, including sedimentation.

BLM - Bureau of Land Management

BMP - see Best Management Practices

BO - Biological Opinion

Canopy - In a forest, the branches from the uppermost layer of trees; in a shrub or grassland, the uppermost layer of shrubs; in a riparian area, the layers of vegetation that project over the stream.

Canopy Cover - The areas of the ground covered by a vertical projection of the canopy. Used to describe how open or dense a stand of trees is, often expressed in 10 percent increments.

Category 1 Pasture - Pasture that has streams which have or have the potential to support populations of bull trout or steelhead.

C&H - Cattle and Horse

CFR - Code of Federal Regulations.

Compaction - Packing together soil particles by exerting force at the soil surface and increasing soil density. Making soil hard and dense, decreasing its ability to support vegetation because the soil can hold less water and air and because roots have trouble penetrating the soil.

Condition and Trend Studies (C&T) - Monitoring sites with permanent transect lines, which can be analyzed and compared to previous years to detect changes in range condition over time.

Connectivity - The arrangement of habitats that allows organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked by corridors of appropriate vegetation (the opposite of fragmentation).

Cover - (1) Trees, shrubs, rocks, or other landscape features that allow an animal to partly or fully conceal itself. (2) The area of ground covered by plants, litter, and coarse fragments, including tree crowns and shrubs that are in direct contact with the ground.

Cumulative Effects - Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively major actions taking place over a period of time.

Cutbank Revetment - An activity that repairs a vertical cutbank by the use of structures and/or rebuilding of a bankful bench. The structure often consists of rocks, logs, rootwads, or other material that help to stabilize the exposed streambank and properly saturate adjacent soils.

CWE - Cumulative Watershed Effects; substantial, adverse influences on water quality and biological resources that arise from the way watersheds function, and particularly from the ways that disturbances within a watershed can be transmitted and magnified within channels and riparian habitats downstream of disturbed areas.

Design Elements - measures taken to reduce the potential for negative impacts on a resource from a project activity.

Detrimental Soil Conditions - There are four categories describing detrimental soil conditions: compaction, displacement, puddling and severely burned soil or charring. Compaction is defined as an increase in soil bulk density of 20% or more from the undisturbed level for volcanic ash soils and 15% or more for residual soils. Displacement is often described as the removal or mixture of topsoil or humus from the A-horizon. Puddling is the breakdown of soil structure under wet conditions. Severely burned soil or charring can be described as having the top layer of mineral soil greatly changed in color, usually to red, and the next one-half inch blackened from organic matter charring by heat conducted through the top layer.

Dimension - Physical characteristics of a stream when a channel is viewed in cross-section.

Direct Effects - Impacts on the environment that are caused by an action and occur at the same time and place.

Diversity - The distribution and abundance of different plant and animal communities and species within an area.

EA - Environmental Assessment

Early Season Grazing - Early season grazing is defined in the terms of the phenology of the vegetation, and is limited to that period where upland vegetation is green but not drying.

Ecosystem - A complete, interacting system of living organisms and the land and water that make up their environment; the home places of all living things, including humans.

Effectiveness Monitoring - Measures whether progress is being made toward achieving a defined management objective generally over the long term (3-7 years).

EIS - see Environmental Impact Statement

Endangered Species - A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a major portion of its range.

Endangered Species Act (ESA) - An act, passed by Congress in 1973 that directed all Federal departments and agencies to seek to conserve endangered and threatened species. Actions authorized, funded, or carried out by Federal departments and agencies should not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat. The act also mandates conferencing with the appropriate agencies.

Environment - The combination of external physical, biological, social, and cultural conditions affecting the growth and development of organisms and the nature of an individual or community.

Environmental Consequences - Effects as a result of an action. Included are direct effects, which are caused by the action and occur at the same time and place; indirect effects, which are caused by the action and are later in time or further, removed in distance but which are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and the related effects on air, water, and other natural systems, including ecosystems. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if, on balance, the agency believes the effects will be beneficial.

Ephemeral Stream - A stream that flows only in direct response to heavy precipitation or snowmelt runoff, often appears as a depression or swale that exhibits no continuous scour channel.

Erosion - The detachment and removal of soil material from its original location.

Exclosure - A structure, generally a fence, that prohibits cattle and/or wildlife from a designated area.

Exotic Species - A species that is not native to the area where it is found.

Ford - A term used for a developed stream crossing, by which there is no culvert or bridge.

Forest Plan (Land and Resource Management Plan) - A document that guides natural resource management and establishes standards and guidelines for a National Forest; required by the National Forest Management Act.

Fragmentation (habitat) - The breakup of a large land area (such as a forest) into smaller patches isolated by areas converted to a different land type (the opposite of connectivity).

FS - Forest Service

FSH - Forest Service Handbook

FSM - Forest Service Manual

Fuels - Includes living plants, dead, woody vegetative materials, materials capable of burning.

Functional Class - Condition class assigned to a management area based on the current condition of the natural resources.

Functioning-At Risk - Riparian sites are considered functioning at risk when they are still in a functional condition but an existing soil, water, or vegetation attribute such as bare ground, stream temperature, or early seral vegetation makes them susceptible to degradation. Upland sites are considered at risk when the land has a reversible (ability to move back to desired condition) loss in capability and increased vulnerability (exposure to detrimental actions) to irreversible degradation (permanently damaged) based upon evaluation of current conditions and processes (FSH 2209.21 R6 Amendment), (Horsefly Rangeland Assessment - Grand Mesa, Uncompahgre, and Gunnison National Forest, 2003).

General Forest Management Area - see Management Area.

Grass-like - A plant of the Cyperaceae or Juncaceae families which vegetatively resembles a true grass of the Poaceae family.

Grass - Members of the plant family Poaceae.

Grazing Permit - A document authorizing livestock to use National Forest System or other lands under Forest Service control for the purpose of livestock production.

Greenline - The first perennial vegetation from the water's edge.

Ground Cover - Perennial vegetation plus litter and coarse fragments (greater than 2 mm in size), including tree crowns and shrubs, that are in direct contact with the ground. Based on the erosion hazard class, effective ground cover is between 20% and 75% of ground covered the first year after management activities.

Growing Season - In temperate climates, that portion of the year when temperature and moisture permit plant growth. In tropical climates, it is determined by availability of moisture.

Gully - An erosional term used to describe concentrated erosion in the vertical direction. Gullies are generally deeper than they are wide. Streams that are "gullied" can be classified as Rosgen "G-type" channels.

Habitat - A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

Headcut - A term used to describe an elongated gully or vertical plunge within a stream. Headcuts generally continue to downcut and migrate upstream over time. Headcuts may be naturally occurring but are more often associated with anthropogenic changes to streams and riparian areas.

Head Month - Syn. Animal Month (AM).

Height-Weight Curve - Relationship of distribution of a plants weight with respect to its height which is used to estimate forage production or utilization of herbaceous species.

Herbaceous Species - Non-woody plant growth.

HUC - Hydrologic Unit Code, as defined by the U.S. EPA.

ICBEMP – Interior Columbia Basin Ecosystem Management Project.

IDT - Interdisciplinary Team.

Implementation Monitoring - Determines whether the management direction is being accurately interpreted and followed generally in the short term (i.e. annually).

Indirect Effects - Impacts on the environment that are caused by an action and are later in time or removed in distance.

INFISH - Interim Inland Native Fish Strategy for the Intermountain, Northern, and Pacific Northwest Regions (Forest Service). A strategy intended to provide interim direction to protect habitat and populations of resident fish outside of anadromous fish habitat in eastern Oregon, eastern Washington, Idaho, western Montana, and portions of Nevada. The Decision Notice/Finding of No Significant Impact for this strategy was signed July 28, 1995.

Interdisciplinary Team (IDT) - A team of people that collectively represent several disciplines and whose duty it is to coordinate and integrate the planning process.

Intermittent Stream - A stream that flows only at certain times of the year when it receives water from other streams or from surface sources such as melting snow; usually exhibits a continuous scour channel.

Irretrievable - A category of impacts that applies to losses of production or commitment of renewable resources. For example, while a linear piece of land is being used as a road, some or all of the timber production there is "irretrievably lost." If the road was rehabilitated after use and soil compaction was reduced, timber production could resume; therefore, the loss of timber production during the time the road was in use is irretrievable but not irreversible, because it is possible for timber production to resume if the piece of land is no longer used as a road.

Irreversible - A category of impacts that applies to non-renewable resources, such as minerals and archaeological sites. Losses of these resources cannot be reversed. Irreversible effects can also refer to effects of actions on resources that can be renewed only after a very long period, such as the loss of soil productivity.

Issue - A matter of controversy, dispute, or general concern over resource management activities or land uses. To be considered a "major " or "key" issue, it must be well defined, relevant to the proposed action, and within the ability of the agency to address through alternative management strategies.

Key Area - A portion of range, which because of its location, grazing or browsing value contains impacts that result principally from livestock grazing and has the potential to respond to and measure changes in grazing management.

Landscape Appearance Method - ocular method for estimating forage utilization based on the general appearance of the rangeland.

Landtype - An inventory map unit with relatively uniform potential for a defined set of land uses. Properties of soils, landform, natural vegetation, and bedrock are commonly components of Landtype delineation used to evaluate potentials and limitations for land use.

Listed Species - A fish, wildlife, or plant species listed under the authorization of the Endangered Species Act as threatened or endangered.

Listed (Streams*)* – Streams contained on the 303(d) List by Oregon Department of Environmental Quality (ODEQ) as water quality limited. Data shows that these streams do not currently meet their designated beneficial use criteria.

FOREST PLAN - Land & Resource Management Plan (see Forest Plan).

LWD - Large Woody Debris, or trees that exist within the active channel or floodplain. LWD serves as in-stream habitat for aquatic species, increases channel complexity, influences sediment transport and deposition, helps maintain the interaction with the floodplain, improves channel and streambank stability, retains organic material, and supports a variety of biological processes.

Management Area (MA) - A unit of land allocated to emphasize a particular resource, based on the capability of the area.

Management Direction - A statement of goals and objectives, management prescriptions, and associated standards and guidelines for attaining them.

Management Indicator Species (MIS*)* - Vertebrate species whose population changes are believed to best serve as an index of a biological community's response to the effects of land management activities or are important for fishing, hunting and trapping.

MIS - see Management Indicator Species

Mitigation - Measures designed to counteract environmental impacts or to make impacts less severe.

National Environmental Policy Act (NEPA) - An act, passed by Congress in 1969 that declared a national policy to encourage productive harmony between humans and their environment. This act requires the preparation of environmental impact statements for Federal actions that are determined to be of major significance (see 40 CFR [Code of Federal Regulations] 1500-1508 for implementing regulations. See also FSH [Forest Service Handbook] 1909.15, the FS Environmental Policy and Procedures Handbook.)

Near Natural Rate of Recovery – Synonymous with PACFISH requirements not to "retard" or "measurably slow" recovery of degraded riparian features. 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.

NEPA - see National Environment Policy Act

NLAA - Not Likely to Adversely Affect

NMFS - National Marine Fisheries Service

NRHP – National Register of Historic Places

No Action Alternative - The most likely condition expected to exist in the future if the project were not to occur.

Non-forest Land - Lands that have never had or that are incapable of having 10% or more of the area occupied by forest trees or lands previously having such cover and currently developed for non-forested use.

Nonfunctioning (Unsatisfactory) - Nonfunctioning riparian sites clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, as listed above. The absence of certain physical attributes such as a floodplain where one should be are indicators of nonfunctioning conditions. Nonfunctioning upland sites have lost the capability across the landscape for ecological resilience. Nonfunctioning conditions occur when the desired condition is not being met and short-term objectives are not achieved to move the land towards desired condition (FSH 2209.21 R6 Amendment), (Bureau of Land Management Technical Report 1737-9), (Horsefly Rangeland Assessment - Grand Mesa, Uncompahgre, and Gunnison National Forest, 2003).

In addition, to the factors described above noxious weeds play a role in the vegetation attribute when determining functionality. Noxious weeds often infest road shoulders, as they are constantly disturbed and lack competing native vegetation. Infestations are cause by many vectors including vehicle travel, wind, livestock and wildlife. Noxious weed infestations that occur off road shoulders can be an indicator of rangelands that are functioning at risk, or non-functioning. The determination of whether the land is at risk or not functioning as desired depends on the size of the weed infestation, the species, and the biology of the species when considering control options. Small infestations of houndstongue for example, may be effectively

controlled without herbicides because it is a biennial plant with heavy seed that is not transported by wind. Small infestations of whitetop cannot be controlled without herbicide because it is a rhizomatous perennial plant that spreads when the roots are disturbed, and the seed is also transported by wind. Currently, few sites within the planning area have herbicide treatment allowed by the Ochoco National Forest Integrated Noxious Weed Management Environmental Analysis (1999).

Small noxious weed infestations, generally less than ¼ acre, may have options related to grazing management, such as fencing, while control measures are carried out. This would isolate the population from disturbance caused by cattle, reducing the risk of spread or new weed populations occurring elsewhere. Large infestations or multiple infestations within a pasture may preclude this option due to practicality and expense.

Noxious weed - A plant that interferes with management objectives for a given area of land at a given point in time.

ODEQ - Oregon Department of Environment Quality

ODFW - Oregon Department of Fish & Wildlife

Outstandingly Remarkable Values - Term used in the National Wild and scenic Rivers Act of 1968 to describe a characteristic of a wild and scenic river that has been identified to be unique, significant, and/or rare.

Overstory - The upper canopy layer of trees.

PACFISH - Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (commonly referred to as PACFISH). The Decision Notice/Finding of No Significant Impact for this strategy was signed July 28, 1995.

Pasture - A grazing area enclosed and separated from other areas by fencing or other barriers; the management unit for grazing land.

Pattern - Physical characteristics of a stream when viewed longitudinally; also referred-to as the plan-view (from above) of a stream (i.e., meander pattern).

PBA – Joint aquatic and terrestrial programmatic biological assessment for Federal lands within the Deschutes Basin administered by Bureau of Land Management Prineville office and all lands within the Deschutes and Ochoco National Forests (current version).

PDC - Project Design Criteria.

Perennial - A plant that lives for three or more years.

Perennial Stream - A stream that flows year–round or past August 1st on an average water year.

Plant Associations - Climax plant community type.

Plant Association Group (PAG) - A group of plant associations that share similar productivities, disturbance regimes, and responses to disturbance. Eight major plant association groups have been described on the Ochoco National Forest.

Plant Communities - A homogeneous unit in respect to the number and relationship of plants in tree, shrub, and ground cover strata.

Prescribed Fire - A wildland fire burning under specified conditions that will accomplish certain planned objectives. The fire may result from either planned or natural ignitions. The Regional Forester must approve proposals for use of natural ignitions for this purpose.

Post-holing - A term used to describe soil disturbance from wildlife and livestock that results in "post-hole like" depressions.

Profile - Physical characteristics of a stream when viewed longitudinally (from the side) along its length (i.e., stream gradient profile).

Properly Functioning (Satisfactory) - Riparian sites are considered to be properly functioning when adequate vegetation, landform, or woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity.

Upland sites are considered properly functioning when the land has the capability across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resilience to perturbations to structure, composition, and processes of their biological or physical components (FSH 2209.21 R6 Amendment), (Moab Allotment Management Plans – Manti-La Sal National Forest, 2001), (Horsefly Rangeland Assessment - Grand Mesa, Uncompahgre, and Gunnison National Forest, 2003).

Proposed Action - A proposal made by the Forest Service to authorize, recommend, or implement an action on National Forest System lands to meet a specific purpose and need.

Puddling - A term used to describe standing water on the soil surface resulting from platiness or lack of structure.

Range Improvement - Any activity or program on or relating to the public lands that is designed to improve production of forage, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, or provide habitat for livestock and wildlife. Range improvements may be structural or nonstructural.

Reference Site - A portion of a pasture, which because of its location, grazing or browsing value, and/or use, serves as an indicative sample of current resource conditions, trend, or degree of use seasonally. This site will be monitored to determine if current management practices are leading to the achievement of the desired conditions.

Residual Vegetation/Stubble Height - Residual vegetation/stubble height is that stubble height remaining at the end of the growing season just prior to winter dormancy.

RHCA - see Riparian Habitat Conservation Area

Riparian Area - An area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation.

Riparian Habitat Conservation Area (RHCA*)* - A portion of a watershed where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, (2) providing root strength for channel stability, (3) shading the stream, and (4) protecting water quality.

RMO - Riparian Management Objectives

Riparian Terraces - These are the Kentucky bluegrass (and associated species) terraces that occur in many of the riparian areas where the water table is generally below the rooting depth.

Scabland - Area having very shallow soils which are subject to severe water saturation and frost heaving during the winter, thus making revegetation virtually impossible.

Scoping - The early stages of preparation of an environmental assessment or environmental impact statement used to solicit public opinion, receive comments and suggestions, and determine the issues to be considered in the development and analysis of a range of alternatives. Scoping may involve public meetings, telephone conversations, mailings, letters, and other contacts.

Season of Use - The time during which livestock grazing is permitted on a given range area, as specified in the grazing permit.

Sediment - Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation - The action or process of depositing sediments.

Sediment Yield - Sediment that is eroded from adjacent land into a body of water.

Sensitive Species - Species identified by a Regional Forester for which population viability is a concern because (a) of substantial current or predicted downward trends in population numbers or density, or, (b) of substantial current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Seral Stage - A plant or animal community that is transitional in stage of succession, being either short- or long-term. If left alone, the seral stage will pass and another plant or animal community will replace it.

Short-Term Effects - For timber management planning, those effects which will not be substantial beyond the RPA planning horizon of 50 years. For DEQ water quality, short-term effects are defined as two days or less. Generally, short-term effects are within the planning period.

Soil Disturbance - Soil disturbance by livestock includes soil compaction, displacement, and postholing. Soil disturbance usually occurs when the soils are moist or wet. Soil disturbance may increase soil erosion, reduce productivity and contribute to changes in vegetation composition, stream function, and water quality (FSH 2209.21, R6 Amendment).

Streambank Alteration - Streambank alteration is the direct disturbance of the streambank, other than by natural forces such as water, ice, and debris, including mechanical damage by livestock and wildlife. Streambank alteration is used to measure the additional impacts livestock may be having on streambanks and assess concentration in riparian areas. It is assumed that this is a good surrogate for measuring streambank stability directly since excessive alteration eventually leads to eroding, unstable banks. Degraded aquatic habitats often exhibit considerable streambank instability, beyond what can be considered natural in unaltered streams (Cowley, E.R. (2002) Guidelines for establishing allowable levels of streambank alteration. BLM, Idaho State Office, http://www.fs.fed.us/rm/boise/teams/fisheries/pac_infish/grazing_docs.htm).

Stream Class - A classification system for streams amended to the LRMP . **Class I** are perennial or intermittent streams containing one or more of the following characteristics: (1) are the direct source of water for domestic use; (2) are used by large numbers of fish for spawning, rearing, or migration; and/or (3) contain enough flow to have a major influence on water quality of a Class I stream. **Class II** are perennial or intermittent streams containing one or more of the following characteristics: (1) are used by moderate numbers of fish for spawning, rearing, or migration; and/or (2) flow enough water to have a moderate influence on downstream quality of a class I or II stream. **Class III** are all other perennial streams not meeting Class I or II definitions. **Class IV** are all other intermittent streams not meeting Class I, II, or III definitions. **Class V** are ephemeral streams.

Subwatershed - An area mostly bounded by ridges or other similar topographic features contributing water, organic matter, dissolved nutrients, and sediments to a lake or stream. One or more subwatersheds make up one watershed. Also known as a 6th field (HUC).

Succession - A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax. An example is the development or series of plant communities (called seral stages) following a major disturbance.

Term Grazing Permit - A document authorizing grazing for a stated number of years (usually 10).

Threatened Species - Species listed under the Endangered Species Act that are likely to become endangered within the foreseeable future throughout all or a major portion of their range.

Timing - Timing restrictions are used to limit the use of a particular area during periods identified as critical to the reproduction or lifecycle of threatened or endangered species. Timing restrictions are also used to achieve certain management direction by limiting use during periods such as late summer that has the potential of retarding the achievement of the management goals. PACFISH/INFISH and the Joint Biological and Terrestrial Programmatic Biological Assessment limit the season of use on category 1 designated pastures in order to protect steelhead trout during critical spawning periods (PACFISH/INFISH, Joint Biological and Terrestrial Programmatic Biological Assessment).

TMDL - Total Maximum Daily Load or a process used to allocate natural and anthropogenic loads of a particular pollutant by State DEQ in an attempt to quantify and reduce levels within a waterbody.

Understory - May include grass, forbs, shrubs, small trees (such as seedlings and saplings), and other plants found beneath the overstory tree canopy.

Upland Site - Referring to non-riparian sites.

USDA - United States Department of Agriculture.

USDI - United States Department of Interior.

USFWS - United States Fish & Wildlife Service

Utilization Standards - The prescribed level of grazing by livestock, which will achieve specific objectives including maintenance of vegetation and soil condition. Expressed as the percent of the annual herbaceous production removed by grazing.

Validation Monitoring - monitoring used to test assumptions underlying management direction.

Watershed – A basin bounded by ridges, saddles, or other similar topographic features that contribute water, organic matter, dissolved nutrients, and sediments to a lake or stream. A watershed is made up of two or more subwatersheds. Also known as a 5th field (HUC).

Wild and Scenic River - A river or sections of a river designated as such by congressional action under the 1968 Wild and Scenic Rivers Act, as supplemented and amended. Wild river areas are those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shoreline essentially primitive and waters unpolluted. Scenic rivers areas are those rivers or sections of rivers that are free of impoundments, with watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. Wild and Scenic River Corridors are generally ¼ mile either side of the river's high water mark.

Width to Depth Ratio (W/D) - A commonly used indicator of channel dimensions that reflects a streams' sediment load, bank materials, channel pattern, and extent of vegetative bank reinforcement. Each channel type has a limited natural range of values when its form is stable.

WQRP - Water Quality Restoration Plan.

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Appendix C

Criteria Used for Determining Functional Class

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Criteria Used for Determining Functional Class

In determining functional class assignments for each pasture within the Westside Allotments Environmental Analysis Project Area, several datasets were analyzed and compared to one another. Upland and riparian vegetation, as well as physical stream channel conditions, were the primary attributes used to determine initial functional classifications for each pasture. In addition, information on the extent of noxious weed infestations was used to support the classifications derived from the vegetation and stream information. The summary of current functional classes for each pasture and allotment can be found in Table 3 of the EA. The information below should provide a consistent methodology for future analyses to re-examine functional classes, should the responsible official so choose to do so.

Baseline Riparian and Upland Vegetation Analysis

Condition & Trend Transects: Twenty-six Condition and Trend Cluster transects (Parker 1951) were established in the 1950's and 1960's. Of the original 26 transects, 4 have been destroyed due to logging operations over the years. The remaining 22 were revisited and analyzed in 2002 and 2003. C&T transects measure and monitor plant species composition changes over time and provides an indicator of ecological trend. C&T transects also provide information about soil surface conditions such as the presence or absence of bare soil, litter, rock or plant material. A summary of these transects and comparison with long-term data is presented, by allotment, in the descriptions below.

Riparian Monitoring Plots

Riparian area information has been collected and current condition calculated using methods outlined in "Monitoring the Vegetation Resources in Riparian Areas" (Winward 2000). Greenline vegetation composition, streambank stability, woody species composition, and regeneration are analyzed during the monitoring process. These permanently-staked monitoring sites provide the basis for current riparian condition and provide a means for long-term monitoring of the riparian resources.

Table 1: Upland C&T Sites for the Deep Creek Allotment

C&T, Vegetation Type	Vegetation C&T	Soil C&T	Existing Condition	Location
#63, CPG2 21	Fair→	Fair→	Functioning at Risk	T14S R24E Sec 5
#69, SD91 11	Good↑	Good→	Functioning at Risk/Functioning	T13s R23E Sec 24

Table 2: Winward Plots for the Deep Creek Allotment

Stream	Existing Condition	Indicator
Big Springs Creek	Functioning at Risk	Early seral vegetation, Streambank Stability
Deep Creek	Functioning at Risk	Early seral vegetation, Streambank Stability
Happy Camp Creek	Functioning at Risk	Very early seral vegetation, Streambank Stability
Double Corral Creek	Functioning at Risk	Early seral vegetation, Streambank Stability
Little Summit Creek	Functioning at Risk/Functioning	Mid seral vegetation

Winward Riparian Plot #7 – Little Summit Creek, T14S, R23E Sec17 SE ¼
Successional Status Rating – 48.7, mid seral
Greenline Stability Rating – 6.83, moderate/high
Woody Species – good age distribution on Alder

Winward Riparian Plot #8, Happy Camp Creek, T14s, R23E, Sec 32 SW ¼
Successional Status Rating – 13.6, very early seral
Greenline Stability Rating – 4.91, low/moderate
Woody Species – species composition good/excellent

Winward Riparian Plot #9 – Double Corral Creek, T13S, R23E, Sec 33 NE ¼
Successional Status Rating – 33, early seral
Greenline Stability Rating – 5.0, moderate
Woody Species – poor age class distribution, low count for willows

Winward Riparian Plot #10 – Big Springs Creek, T14S, R23E, Sec 19 NW ¼
Successional Status Rating – 26.8, early seral
Greenline Stability Rating – 5.47, moderate
Woody Species – good age distribution of alder, low willow count

Winward Riparian Plot #11 – Deep Creek, T14S, R23E, Sec 27 NE ¼
Successional Status Rating – 30.38, early seral
Greenline Stability Rating – 5.62, moderate
Woody Species – lack of willow, site has potential for willow

Table 3: Upland C&T Sites Not Meeting Desired Conditions for the Derr Allotment

C&T, Vegetation Type	Vegetation C&T	Soil C&T	Existing Condition	Location
#43, MD	Very Poor↓	Good↑	Functioning at Risk	T14S R24E Sec 5
#45, SD91 11	Good↑	Fair→	Functioning at Risk	T13s R23E Sec 24
#47, SD91 11	Poor→	Good↑	Functioning at Risk	T13S R23E Sec 35
#51, MD	Poor↑	Good↑	Functioning at Risk	T13S R23E Sec 11
#57, MD	Poor→	Good↑	Functioning at Risk	T14S R23E Sec 1

Table 4: Winward Plots for the Derr Allotment

Stream	Existing Condition	Indicator
Jackson Creek	Functioning at Risk	Early seral vegetation, Streambank Stability
Tributary of Jackson Creek	Functioning at Risk	Very early seral vegetation, Streambank Stability

Greenline Stability Rating – 4.71, low/moderate
Woody Winward Riparian Plot #12– Trib. of Jackson Creek, T13S, R24E, Sec 19 SW ¼
Successional Status Rating – 0.0, very early seral
Greenline Stability Rating – 3.29, low
Woody Species – no alder or willow found on site

Winward Riparian Plot #13 – Jackson Creek, T14S, R23E, Sec 19 NW ¼
Successional Status Rating – 30.0, early seral
Species – site lacking willow and alder

Table 5: Upland C&T Sites for the Happy Allotment

C&T, Vegetation Type	Vegetation C&T	Soil C&T	Existing Condition	Location
#4, CPG2 21	Fair→	Good↑	Functioning at Risk	T13S R23E Sec 3
#5, DM	Good→	Good→	Functioning at Risk/Functioning	T13S R23E Sec 5
#7, MM	Fair↑	Fair→	Functioning at Risk	T13S R23E Sec 29
#10, MM	Good↑	Good→	Functioning at Risk/Functioning	T13S R23E Sec 16
#11, CPG2 21	Fair→	Good→	Functioning at Risk	T13S R23E Sec 21
#12/13, MM	Fair→	Fair↓	Functioning at Risk	T13S R23E Sec 8

Table 6: Winward Plots for the Happy Allotment

Stream	Existing Condition	Indicator
Haypress Creek	Functioning at Risk	Very early seral vegetation, Streambank Stability
Happy Creek	Functioning at Risk	Mid seral vegetation, Streambank Stability

Winward Riparian Plot #3 – Haypress Creek, T13S, R23E, Sec 15 SW ¼
Successional Status Rating – 13.0, very early seral
Greenline Stability Rating – 5.53, moderate
Woody Species – site lacking willow and alder

Winward Riparian Plot #4 – Happy Creek, T13S, R23E, Sec 20 SW ¼
Successional Status Rating – 48.0, mid seral
Greenline Stability Rating – 5.58, moderate
Woody Species – site lacking in age classes for willow and alder

Table 7: Upland C&T Sites for the Little Summit Allotment

C&T, Vegetation Type	Vegetation C&T	Soil C&T	Existing Condition	Location
#60, SD92 21	Poor↓	Good↑	Functioning at Risk	T14S R23E Sec 22
#66, SD91 11	Very Poor↓	Good→	Functioning at Risk/Non-functioning	T14S R24E Sec 5
#67, SD91 11	Good↑	Good↑	Functioning at Risk/Functioning	T14s R23e Sec 15
#68, CPG21	Fair↑	Good↑	Functioning at Risk	T13S R23E Sec 13

Table 8: Winward Plots for the Little Summit Allotment

Stream	Existing Condition	Indicator
Little Summit Creek	Functioning at Risk/Functioning	Mid seral vegetation, Streambank stability
Tributary of Jackson Creek	Functioning at Risk	Very early seral vegetation, Streambank stability

Winward Riparian Plot #2 – Tributary of Jackson Creek, T14S, R23E, Sec 7 NE ¼
Successional Status Rating – 20.5, very early seral
Greenline Stability Rating – 4.26, low/moderate
Woody Species – site lacking willow and alder

Winward Riparian Plot #6 – Little Summit Creek, T14S, R23E, Sec 22 SE ¼
Successional Status Rating – 54.89, mid seral
Greenline Stability Rating – 5.85, moderate
Woody Species – site-lacking age classes for willow and alder

Table 9: Upland C&T Sites for the Roba Allotment

C&T, Vegetation Type	Vegetation C&T	Soil C&T	Existing Condition	Location
#7, SD92 21	Good→	Good→	Functioning at Risk/Functioning	T15S R23E Sec 6
#12, SD19 11	Poor→	Fair→	Functioning at Risk/Non-functioning	T15s R22E Sec 15
#15, SD19 11	Good→	Fair↑	Functioning at Risk	T15S R23E Sec 6
#28, CPG2 21	Fair↑	Fair↓	Functioning at Risk/Non-functioning	T15S R23E Sec4

Table 10: Winward Plots for the Roba Allotment

Stream	Existing Condition	Indicator
North Fork Crooked River	Functioning at Risk	Mid seral vegetation
Roba Creek	Functioning at Risk/Non-functioning	Early seral vegetation, Streambank stability
Dipping Vat Creek	Functioning at Risk/Non-functioning	Very early seral vegetation, Streambank stability

Winward Riparian Plot #1 – Roba Creek, T15S, R23E, Sec 16 NW ¼
Successional Status Rating – 24.0, early seral
Greenline Stability Rating – 5.15, moderate
Woody Species – site lacking willow and alder

Winward Riparian Plot #5 – Dipping Vat Creek, T15S, R23E, Sec 14 SW ¼
Successional Status Rating – 14.0, very early seral
Greenline Stability Rating – 3.78, low
Woody Species – site lacking willow and alder

Winward Riparian Plot #14 – North Fork Crooked River, T15S, R22E, Sec 10 NW ¼
Successional Status Rating – 59.53, mid seral
Greenline Stability Rating – 6.78, moderate/good
Woody Species – site has fair/good woody species composition

Baseline Aquatic Habitat Condition Analysis

Methodology: Streams within the Westside EA planning area were analyzed to provide information about current physical conditions, upon which a functional class determination was made (Table 11). In summary, Ochoco NF Bottom Line Survey and Level II Stream Surveys (where both were directly comparable by methodology) were examined, by reach, for the project area. These reaches were assigned to the pasture where they [wholly or in-part] fell within. When a reach overlapped pastures it was assigned to the one in which the greater length fell. In some cases multiple datasets (i.e., multiple years) were available and examined as well. Reach-scale data for streambank stability and width-to-depth ratios was then summarized and compared to PACFISH/INFISH standards for stream habitat conditions. These parameters were

chosen because of their relevance to livestock grazing impacts (further discussion can be found in the Fisheries Biological Evaluation). While we recognize that natural variability exists and that some parameters may actually be appropriate for a given stream type (e.g., width-to-depth ratios between 10-14), a consistent methodology was required if comparisons were to be made between reaches. Therefore, any standards exceeded (i.e., width:depth <10, bank stability >80%) were considered degraded.

If width-to-depth ratios and streambank instability values were not exceeded in <25% of the reaches within a pasture, then it was considered properly-functioning. If 25-75% of the reaches exceeded standards for both parameters, then it was considered functioning-at-risk. If >75% of the reaches exhibited exceeding of standards, then it was considered non-functioning. This methodology is indeed arbitrary but the determinations were verified using professional judgment and personal knowledge of these streams. In other words, did the functional class determinations match with what we know of these conditions "on the ground," as it would fit within the Proper Functioning Condition (PFC) framework? While the official PFC methodology was not used, it is very roughly transferable or can at least be considered in similar terms.

Table 23: Current condition evaluation for stream reaches within the Westside Allotments EA project area, arranged by pasture.

Stream Name, Reach Number	Allotment	Pasture	Measured Unstable Bank (% cutbank/reach)	Range of Unstable Bank within 95% C.I. (±26.5%)*	Measured Width: Depth Ratio	Range of Width:Depth Ratio within 95% C.I. (±17.1%)*	Functional Class
Deep, 4	Deep	North	2.4 (1999)	1.8 – 3.0	**23.4** (1999)	19.4 – 27.4	FAR
Jackson, 1	Deep	North	0.5 (1999)	0.4 – 0.6	**25.0** (1999)	20.7 – 29.3	
Jackson, 1	Deep	North	6.0 (1994)	4.4 – 7.6	**26.9** (1994)	22.3 – 31.5	
Crazy, 2	Deep	North	3.9 (1994)	2.9 – 4.9	5.5 (1994)	4.6 – 6.4	
Happy Camp, 1	Deep	North	0 (1998)	0.0	**11.0** (1998)	9.1 – 12.9	
Happy Camp, 1	Deep	North	1.3 (1994)	1.0 – 1.6	**11.5** (1994)	9.5 – 13.5	
Deep, 1	Deep	South	8.5 (1999)	6.2 – 10.8	**44.4** (1999)	36.8 – 52.0	FAR
Deep, 2	Deep	South	0.0 (1999)	0.0	**32.5** (1999)	26.9 – 38.1	

Deep, 3	Deep	South	0.8 (1999)	0.6 – 1.0	**38.6** (1999)	32.0 – 45.2	
Crazy, 1	Deep	South	0.5 (1994)	0.4 – 0.6	**16.8** (1994)	13.9 – 19.7	
Jackson, 4	Derr	East	3.3 (1999)	2.4 – 4.2	**19.2** (1999)	15.9 – 22.5	
Jackson, 5	Derr	East	13.8 (1994)	10.1 – 17.5	9.6 (1994)	8.0 – 11.2	
Jackson, 6	Derr	East	9.9 (1994)	7.3 – 12.5	**21.0** (1994)	17.4 – 24.6	FAR
Chamberlin, 1	Derr	East	15.5 (1994)	11.4 – 19.6	**15.3** (1994)	12.7 – 17.9	
Toggle, 2	Derr	East	17.2 (1998)	12.6 – 21.8	**11.2** (1998)	9.3 – 13.1	
Jackson, 2	Derr	West	0.5 (1999)	0.4 – 0.6	**28.9** (1999)	24.0 – 33.8	
Jackson, 3	Derr	West	6.5 (1999)	4.8 – 8.2	**16.8** (1999)	13.9 – 19.7	
Jackson, 2	Derr	West	13.5 (1994)	9.9 – 17.1	**27.0** (1994)	22.4 – 31.6	
Jackson, 3	Derr	West	11.5 (1994)	8.5 – 14.5	**12.0** (1994)	9.9 – 14.1	FAR
Jackson, 4	Derr	West	15.6 (1994)	11.5 – 19.7	7.0 (1994)	5.8 – 8.2	
Toggle, 1	Derr	West	6.0 (1998)	4.4 – 7.6	**14.0** (1998)	11.6 – 16.4	
Fort, 1	Derr	West	0.8 (1997)	0.6 – 1.0	5.4 (1997)	4.5 – 6.3	
Double Corral, 1	Happy	East	**20.5** (1994)	15.1 – 25.9	9.9 (1994)	8.2 – 11.6	
Double Corral, 2	Happy	East	15.5 (1994)	11.4 – 19.6	9.0 (1994)	7.5 – 10.5	FAR
Happy Camp, 5	Happy	North	19 (1998)	14.0 – 24.0	**16.5** (1998)	13.7 – 19.3	
Happy Camp, 9	Happy	North	19.9 (1994)	14.6 – 25.2	**11.5** (1994)	9.5 – 13.5	PF

Keeton, 1	Happy	North	1.1 (1997)	0.8 – 1.4	8.7 (1997)	7.2 – 10.2	
Keeton, 2	Happy	North	0.5 (1997)	0.4 – 0.6	7.1 (1997)	5.9 – 8.3	
Fry, 1	Happy	North	1.0 (1997)	0.7 – 1.3	7.3 (1997)	6.1 – 8.5	
Fry, 2	Happy	North	1.0 (1997)	0.7 – 1.3	4.5 (1997)	3.7 – 5.3	
Mac, 1	Happy	North	0.5 (1997)	0.4 – 0.6	5.9 (1997)	4.9 – 6.9	
E. Fk. Crazy, 1	Happy	West	1.2 (1994)	0.9 – 1.5	6.6 (1994)	5.5 – 7.7	FAR
E. Fk. Crazy, 2	Happy	West	1.6 (1994)	1.2 – 2.0	4.9 (1994)	4.1 – 5.7	
W. Fk. Crazy, 1	Happy	West	5.2 (1994)	3.8 – 6.6	8.6 (1994)	7.1 – 10.1	
W. Fk. Crazy, 2	Happy	West	**24.6** (1994)	18.1 – 31.1	5.0 (1994)	4.1 – 5.9	
Happy Camp, 2	Happy	West	3 (1998)	2.2 – 3.8	**10.0** (1998)	8.3 – 11.7	
Happy Camp, 3	Happy	West	8 (1998)	5.9 – 10.1	7.9 (1998)	6.5 – 9.3	
Happy Camp, 4	Happy	West	15 (1998)	11.0 – 19.0	8.3 (1998)	6.9 – 9.7	
Happy Camp, 2	Happy	West	1.5 (1994)	1.1 – 1.9	**11.0** (1994)	9.1 – 12.9	
Happy Camp, 3	Happy	West	11.0 (1994)	8.1 – 13.9	8.9 (1994)	7.4 – 10.4	
Happy Camp, 4	Happy	West	11.3 (1994)	8.3 – 14.3	**10.3** (1994)	8.5 – 12.1	
Happy Camp, 5	Happy	West	10.3 (1994)	7.6 – 13.0	**10.0** (1994)	8.3 – 11.7	
Happy Camp, 6	Happy	West	14.9 (1994)	11.0 – 18.8	**12.3** (1994)	10.2 – 14.4	
Happy Camp, 7	Happy	West	**26.7** (1994)	19.6 – 33.8	9.6 (1994)	8.0 – 11.2	
Happy Camp, 8	Happy	West	18.8 (1994)	13.8 – 23.8	**10.9** (1994)	9.0 – 12.8	

Little Summit, 1	Little Summit	Little Summit	2.9 (1998)	2.1 – 3.7	**27.1** (1998)	22.5 – 31.7	FAR
Little Summit, 2	Little Summit	Little Summit	3.1 (1998)	2.3 – 3.9	**17.2** (1998)	14.3 – 20.1	
Little Summit, 3	Little Summit	Little Summit	6.1 (1998)	4.5 – 7.7	9.6 (1998)	8.0 – 11.2	
Little Summit, 4	Little Summit	Little Summit	Private land	na	Private land	na	
Little Summit, 5	Little Summit	Little Summit	15.5 (1998)	11.4 – 19.6	**21.5** (1998)	17.8 – 25.2	
Little Summit, 6	Little Summit	Little Summit	4.3 (1998)	3.2 – 5.4	**22.6** (1998)	18.7 – 26.5	
Little Summit, 7	Little Summit	Little Summit	17.8 (1998)	13.1 – 22.5	8.5 (1998)	7.0 – 10.0	
Little Summit, 8	Little Summit	Little Summit	6.7 (1998)	4.9 – 8.5	8.5 (1998)	7.0 – 10.0	
Thornton, 1	Little Summit	Little Summit	**27.7** (1995)	20.4 – 35.0	**12** (1995)	9.9 – 14.1	
Thornton, 2	Little Summit	Little Summit	10.1 (1995)	7.4 – 12.8	8.8 (1995)	7.3 – 10.3	
Thornton, 3	Little Summit	Little Summit	14.0 (1995)	10.3 – 17.7	**19.0** (1995)	15.8 – 22.2	
Thornton, 4	Little Summit	Little Summit	4.6 (1995)	3.4 – 5.8	8.9 (1995)	7.4 – 10.4	
Thronton, 5	Little Summit	Little Summit	11.6 (1995)	8.5 – 14.7	5.1 (1995)	4.2 – 6.0	
Thornton, 6	Little Summit	Little Summit	17.9 (1995)	13.2 – 22.6	**12.8** (1995)	10.6 – 15.0	
Toggle, 3	Little Summit	Little Summit	7.6 (1998)	5.6 – 9.6	9.6 (1998)	8.0 – 11.2	
Toggle, 4	Little Summit	Little Summit	13.6 (1998)	10.0 – 17.2	**20.7** (1998)	17.2 – 24.2	
Dry Paulina, 1	Roba	Dipping Vat	8.9 (1995)	6.5 – 11.3	**31.6** (1995)	26.2 – 37.0	FAR
Dry Paulina, 2	Roba	Dipping Vat	5.4 (1995)	4.0 – 6.8	**16.8** (1995)	13.9 – 19.7	

Dry Paulina, 3	Roba	Dipping Vat	7.6 (1995)	5.6 – 9.6	**16.7** (1995)	13.8 – 19.6	
Dry Paulina, 4	Roba	Dipping Vat	**33.9** (1995)	24.9 – 42.9	6.7 (1995)	5.6 – 7.8	
Dipping Vat, 1	Roba	Dipping Vat	12.0 (1995)	8.8 – 15.2	**15.7** (1995)	13.0 – 18.4	
Dipping Vat, 2	Roba	Dipping Vat	11.8 (1995)	8.7 –	**22.0** (1995)	18.2 – 25.8	
Dipping Vat, 3	Roba	Dipping Vat	5.1 (1995)	3.7 – 6.5	**12.3** (1995)	10.2 – 14.4	
Dipping Vat, 4	Roba	Dipping Vat	15.6 (1995)	11.5 – 19.7	9.5 (1995)	7.9 – 11.1	
NFk Crooked, 1	Roba	Riparian	3.8 (2002)	2.8 – 4.8	**48.8** (2002)	40.5 – 57.1	
NFk Crooked, 2	Roba	Riparian	11.8 (2002)	8.7 – 14.9	**43.3** (2002)	35.9 – 50.7	FAR
NFk Crooked, 3	Roba	Riparian	14.0 (2002)	10.3 – 17.7	**52.5** (2002)	43.5 – 61.5	
Roba, 1	Roba	Roba	**25.1** (1995)	18.4 – 31.8	**17.6** (1995)	14.6 – 20.6	
Roba, 2	Roba	Roba	**20.5** (1995)	15.1 – 25.9	**12.9** (1995)	10.7 – 15.1	
Roba, 3	Roba	Roba	**33.1** (1995)	24.3 – 41.9	**10.0** (1995)	8.3 – 11.7	
Roba, 4	Roba	Roba	**44.7** (1995)	32.9 – 56.5	**12.0** (1995)	9.9 – 14.1	NF
Roba, 5	Roba	Roba	10.5 (1995)	7.7 – 13.3	**10.5** (1995)	8.7 – 12.3	
Hewed Log, 1	Roba	Roba	4.7 (1995)	3.5 – 5.9	**20.3** (1995)	16.8 – 23.8	
Burnt Corral, 1	Roba	West	7.3 (1999)	5.4 – 9.2	**12.9** (1999)	10.7 – 15.1	
Indian, 1	Roba	West	3.5 (1999)	2.6 – 4.4	**16.3** (1999)	13.5 – 19.1	FAR

*Confidence Interval values are derived from a single seasons' data and may not necessarily apply to all stream surveys (and surveyors). Actual variance may have been more or less for each year, however, no prior attempt to quantify variance was

made. Thus, these values, while truly only representative of stream surveys (and surveyors) in 2003, can be used to critically evaluate the effectiveness in applying this dataset in management decisions. Functional class determinations were made based upon measured values since we must accept this data as absolute in lieu of variance estimates. The aforementioned considerations should be accepted, however.

Notes: Items in **bold** are measured values that exceed PACFISH/INFISH interim standards. Data source year is provided in parentheses. Some stream reaches may cross pasture and/or allotment boundaries but were assigned to the pasture where the greatest length fell within.

References

Johnson, R. 2003. *Variance among surveyors of data collected for Bottom Line Surveys and Level II surveys* (unpublished report). United States Forest Service, Ochoco National Forest, Prineville, Oregon.

Noxious Weed Analysis

Known noxious weed populations greater than 0.10 acres were identified and summed, by stream, for the Westside Allotments project area. Information on the extent of weed coverage in each pasture was compared to the vegetation and stream data, above. The following data supports the functional class determinations previously made for each of the other resources and therefore became supplementary information that was later used for the effects analysis. Future evaluations of pasture-level baseline existing conditions may wish to consider the extent of noxious weed coverage as it is indicative of the health, resiliency, structure and function of existing vegetation and soils.

Table 12.1: Noxious Weed Infestations by Stream and Allotment.

SITE NUMBER	SURV_DATE	SPECIES	ALLOTMENT NAME	GROSS ACRES	STREAM	LENGTH OF STREAM OCCUPIED (LINEAR FT) *	SITE TYPE
D20453	9/19/2002	CEDI3	DEEP CREEK	0.10	Double Corral	30	Road/stream
D20171	7/9/1999	CIAR4	DEEP CREEK	0.10	Buck Hollow	30	Stream
D20167	7/9/1999	HYPE	DEEP CREEK	0.10	Buck Hollow	50	Stream
0607020254	6/30/1997	ACRE3	DEEP CREEK	0.1			Road
0607020233	6/30/1997	CEBI2	DEEP CREEK	20			Road/upland
0607020239	6/30/1997	CEBI2	DEEP CREEK	35			Road/upland
0607020247	6/30/1997	CEBI2	DEEP CREEK	15			Road/upland
0607020241	6/30/1997	LIDAD	DEEP CREEK	0.1			Road
D20175	7/22/1999	CIAR4	DEEP CREEK	0.10			Road
D20174	7/22/1999	CIAR4	DEEP CREEK	0.10			Road
D20176	7/22/1999	CYOF	DEEP CREEK	0.10			Road
D20209	7/1/1996	LIDAD	DEEP CREEK	0.10			Road
D20443	9/17/2002	CYOF	DEEP CREEK	0.10			Road
D20184	7/27/1999	PORE5	DEEP CREEK	0.10			Road
D20183	7/27/1999	CIAR4	DEEP CREEK	0.10			Road
D20177	7/22/1999	PORE5	DEEP CREEK	0.10			Road
D20180	7/23/1999	CEBI2	DEEP CREEK	0.10			Road
D20179	7/23/1999	CYOF	DEEP CREEK	0.10			Road
D20178	7/23/1999	CYOF	DEEP CREEK	0.10			Road
D20182	7/27/1999	CIAR4	DEEP CREEK	0.10			Road
D20170	7/9/1999	CYOF	DEEP CREEK	0.10			Road
D20169	7/9/1999	CIAR4	DEEP CREEK	0.10			Road
D20168	7/9/1999	CYOF	DEEP CREEK	0.10			Road
D20181	7/23/1999	PORE5	DEEP CREEK	0.10			Road
D20368	8/17/2001	CYOF	DEEP CREEK	0.10			Road
			Total	71.9	Total	110	
0607020233	6/30/1997	CEBI2	HAPPY	25			Road/upland
0607020234	6/30/1997	CEBI2	HAPPY	1.5			Road
0607020231	6/30/1997	CEDI3	HAPPY	4.9			Road/upland

0607020230	6/30/1997	DIPSA	HAPPY	0.1			Road
D20428	8/12/2002	CIAR4	HAPPY	0.10			Road
D20451	9/10/2002	CEBI2	HAPPY	0.10			Road
D20452	9/10/2002	CIAR4	HAPPY	0.10			Road
D20500	8/29/2002	CIAR4	HAPPY	0.10			Road
D20429	8/15/2002	CIAR4	HAPPY	0.20			Road
D20206	6/30/1997	CEDI3	HAPPY	0.10			Road
			Total	32.20			
D20197	7/30/1999	CEBI2	LITTLE SUMMIT	0.10			Road
D20200	7/30/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20198	7/30/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20199	7/30/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20188	7/28/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20189	7/28/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20196	7/30/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20201	7/30/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20187	7/28/1999	HYPE	LITTLE SUMMIT	0.10			Road
D20193	7/29/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20194	7/29/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20195	7/29/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20186	7/28/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20192	7/29/1999	CIAR4	LITTLE SUMMIT	0.10			Road
D20191	7/29/1999	HYPE	LITTLE SUMMIT	0.10			Road
D20185	7/28/1999	CEDI3	LITTLE SUMMIT	0.10			Road
D20190	7/28/1999	CIAR4	LITTLE SUMMIT	0.10			Road
			Total	1.70			
0607020255	8/30/2000	CEDI3	ROBA	0.1			Road
0607020140	6/23/1999	CYOF	ROBA	1.5			Road
0607020141	6/23/1999	CYOF	ROBA	1.2			Road
0607020152	6/23/1999	CYOF	ROBA	7			road/upland
0607020257	9/12/2000	CYOF	ROBA	0.1			Road
0607020260	9/12/2000	CYOF	ROBA	0.1			Road
0607020327	8/17/2001	CYOF	ROBA	0.1			Road
0607020352	9/14/2001	CYOF	ROBA	2.7			Road
0607020354	9/14/2001	CYOF	ROBA	0.7			Road
0607020364	9/22/2001	CYOF	ROBA	0.1			Road

0607020392	11/12/2001	CYOF	ROBA	12			road/upland
0607020398	11/12/2001	CYOF	ROBA	15			road/upland
0607020462	9/17/2003	CYOF	ROBA	0.4			Road
0607020467	9/11/2003	CYOF	ROBA	8.8			road/upland
0607020256	6/30/1997	DIPSA	ROBA	1.5			upland
0607020262	6/30/1999	TACA8	ROBA	0.25			Road
0607020263	6/30/1999	TACA8	ROBA	6			Road
D20331	6/20/2001	CADR	ROBA	0.10			Road
D20351	9/14/2001	CYOF	ROBA	0.10			Road
D20165	7/9/1999	CADR	ROBA	0.10			Road
D20442	9/6/2002	CIAR4	ROBA	0.10			Road
D20164	7/9/1999	CEDI3	ROBA	0.10			Road
D20156	6/30/1999	CIAR4	ROBA	0.10			Road
D20460	10/2/2002	CYOF	ROBA	0.10			Road
D20307	8/13/2001	CYOF	ROBA	0.10			Road
D20365	9/22/2001	CYOF	ROBA	0.10			Road
D20166	7/9/1999	CIAR4	ROBA	0.10			Road
D20155	6/23/1999	CYOF	ROBA	0.10			Road
D20356	9/14/2001	CYOF	ROBA	0.10			Road
D20418	8/23/2001	CYOF	ROBA	0.10			Road
D20158	6/30/1999	CIAR4	ROBA	0.10			Road
D20154	6/23/1999	CYOF	ROBA	0.10			Road
D20385	10/26/2001	CYOF	ROBA	0.10			Road
D20386	10/26/2001	CYOF	ROBA	0.10			Road
D20159	6/30/1999	CIAR4	ROBA	0.20			Road
D20160	6/30/1999	CYOF	ROBA	0.10			Road
D20161	6/30/1999	CYOF	ROBA	0.10			Road
D20469	18991230	CYOF	ROBA	0.25			Road
D20215	6/30/1997	DIPSA	ROBA	0.10			Road
D20421	6/5/2002	CYOF	ROBA	0.10			Road
D20470	18991230	VETH	ROBA	0.10			Road
D20473	7/27/2003	CYOF	ROBA	0.10			Road
D20133	10/16/1998	CYOF	ROBA	0.10			Road
D20369	10/12/2001	CYOF	ROBA	0.10			Road
D20137	10/16/1998	CYOF	ROBA	0.10			Road
D20136	10/16/1998	CYOF	ROBA	0.25			Road
D20426	6/27/2002	CYOF	ROBA	0.10			Road
D20374	10/12/2001	CYOF	ROBA	0.25			Road
D20422	6/11/2002	CYOF	ROBA	0.10			Road
D20162	7/9/1999	CYOF	ROBA	0.25			Road
D20305	6/29/2001	CYOF	ROBA	0.10			Road
D20131	10/13/1998	CYOF	ROBA	1.00			Road
D20372	10/12/2001	CYOF	ROBA	0.10			Road
D20130	10/13/1998	CYOF	ROBA	0.10			Road
D20373	10/12/2001	CYOF	ROBA	0.10			Road
D20311	7/11/2001	CYOF	ROBA	0.10			Road
D20139	6/23/1999	TACA8	ROBA	0.25			Road
D20318	7/11/2001	CYOF	ROBA	0.10			Upland

			Total	63.4			
0607020132	10/13/1998	CYOF	ROBA	25.9	Burnt Corral	4221	Stream
0607020317	7/11/2001	CYOF	ROBA	98	Burnt Corral	6732	upland
0607020149	6/23/1999	CYOF	ROBA	55	Burnt Corral	5947	Upland/stream
0607020146	6/23/1999	CYOF	ROBA	125	W. Trib Burnt Corral	14256	Stream
			Total	303.9	Total	31155	
0607020138	10/1911998	CYOF	ROBA	26	Hewed Log	3095	Stream
D20444	9/6/2002	CYOF	ROBA	1.50	Hewed Log	700	Stream
0607020464	9/11/2003	CYOF	ROBA	9.6	Hewed Log	1518	Stream
0607020309	7/11/2001	CYOF	ROBA	3.5	Hewed Log	614	road/upland
			Total	40.6	Total	5927	
0607020157	6/30/1999	CYOF	ROBA	2	Dipping Vat	419	Stream
0607020306	6/29/2001	CYOF	ROBA	5	Dipping Vat	1224	Stream
0607020328	8/17/2001	CYOF	ROBA	25	Dipping Vat	2686	Upland/stream
0607020434	8/16/2002	CYOF	ROBA	4	Dipping Vat	333	pond
0607020465	8/27/2003	CYOF	ROBA	4.6	Dipping Vat	901	Stream
D20435	8/16/2002	CYOF	ROBA	0.10	Dipping Vat	30	Stream
D20441	9/6/2002	CIAR4	ROBA	0.10	Dipping Vat	30	Stream
D20432	8/16/2002	CYOF	ROBA	0.10	Dipping Vat	30	Stream
D20431	8/16/2002	CYOF	ROBA	0.10	Dipping Vat	30	Stream
D20163	7/9/1999	CIAR4	ROBA	0.20	Dipping Vat	30	Stream
0607020413	8/23/2001	CYOF	ROBA	14	W. Trib Dipping Vat	1825	Stream
0607020416	8/23/2001	CYOF	ROBA	5	W. Trib Dipping Vat	884	Stream
0607020419	9/22/2004	CYOF	ROBA	54	W. Trib Dipping Vat	5798	Upland/stream
			Total	114.2	Total	14221	
0607020312	7/11/2001	CYOF	ROBA	19.7	Roba	5838	Stream
0607020252	8/15/2000	CYOF	ROBA	116	Roba	21427	Stream
0607020463	7/27/2003	CYOF	ROBA	4	Roba	1333	Stream
D20387	10/26/2001	CYOF	ROBA	0.10	Roba	30	Stream
0607020313	7/11/2001	CYOF	ROBA	5	W. Trib Roba	1657	Stream
0607020405	11/12/2001	CYOF	ROBA	1	W. Trib Roba	429	Stream
D20474	7/27/2003	CYOF	ROBA	0.10	W. Trib of Roba	30	Stream
D20151	6/23/1999	PORE5	ROBA	0.10	W. Trib of Roba	30	Stream
0607020324	7/11/2001	CYOF	ROBA	35	Mid Trib Roba	1650	upland
0607020399	11/12/2001	CYOF	ROBA	25	Mid Trib Roba	4561	Stream
0607020402	11/12/2001	CYOF	ROBA	3.3	Mid Trib Roba	1073	Stream
0607020466	9/22/2004	CYOF	ROBA	12	Mid Trib Roba	1188	Stream
0607020468	8/23/2003	CYOF	ROBA	34.1	Mid Trib Roba	4699	Stream
D20447	9/6/2002	CYOF	ROBA	1.50	Trib of Roba	650	Stream

			Total	256.9	Total	44594	
0607020361	9/22/2001	CYOF	ROBA	2.5	Dry Paulina	677	Stream
0607020461	9/17/2003	CYOF	ROBA	5	Head of Paulina	1076	road/upland
D20375	10/12/2001	CYOF	ROBA	0.10	Paulina	30	Stream
D20323	7/11/2001	CYOF	ROBA	0.10	Paulina	50	Stream
			Total	5.2	Total	1156	
0607020378	11/17/2001	CYOF	ROBA	38.9	Indian	8633	Stream/road
D20472	18991230	CYOF	ROBA	5.00	Indian	1700	Stream
D20471	7/18/2003	CYOF	ROBA	0.10	Indian	30	Stream
			Total	44	Total	10363	
D20370	10/12/2001	CYOF	ROBA	0.10	reservoir	20	Stream
* Percentage of weed cover varies by site, range is from 10% to 95%							

Appendix D

TE&S Biological Evaluation
Conclusion of Summary of Effects

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Table 16: Westside Allotments Environmental Analysis Project

SPECIES	ALT. 1	ALT. 2	ALT. 3
1. Bull Trout	N/A	N/A	N/A
2. Redband Trout	BI	MIIH	MIIH
3. Mid-Columbia Steelhead	NLAA	NLAA	NLAA
4. Chinook Salmon – Essential Fish Habitat	N/A	N/A	N/A
5. Westslope Cutthroat Trout	N/A	N/A	N/A
6. Malheur Mottled Sculpin	N/A	N/A	N/A
7. Blue Mountain Cryptochian Caddisfly	N/A	N/A	N/A
8. Northern Bald Eagle	NE	NE	NE
9. California Woverine	NI	MIIH	MIIH
10. American Peregrine Falcon	NI	NI	NI
11. Bufflehead	NI	NI	NI
12. Gray Flycatcher	NI	NI	NI
13. Upland Sandpiper	NI	NI	NI
14. Tricolored Blackbird	NI	NI	NI
15. Greater Sage Grouse	MIIH	MIIH	MIIH
16. California Wolverine	NI	NI	NI
17. Pygmy Rabbit	NI	NI	NI
18. Columbia Spotted Frog	NI	MIIH	MIIH
19. Achnatherum hendersonii	NI	MIIH	MIIH
20. Achnatherum wallowensis	NI	MIIH	MIIH
21. Artemisia ludoviciana ssp. estesii	N/A	N/A	N/A
22. Astragalus diaphanus var. diurnus	N/A	N/A	N/A
23. Astragalus peckii	N/A	N/A	N/A
24. Astragalus tegetarioides	NI	MIIH	MIIH

SPECIES	ALT 1	ALT 2	ALT 3
25. Botrychium ascendens	NI	MIIH	MIIH
26. Botrychium crenulatum	NI	MIIH	MIIH
27. Botrychium minganense	NI	MIIH	MIIH
28. Botrychium montanum	NI	MIIH	MIIH
29. Botrychium paradoxum	NI	MIIH	MIIH
30. Botrychium pinnatum	NI	MIIH	MIIH
31. Calochortus longebarbatus var. longebarbatus	N/A	N/A	N/A
32. Calochortus longebarbatus var. peckii	NI	MIIH	WIFV*
33. Carex backii	N/A	N/A	N/A
34. Carex hystercina	NI	MIIH	MIIH
35. Carex interior	NI	MIIH	MIIH
36. Carex stenophylla	N/A	N/A	N/A
37. Cypripedium parviflorum	NI	MIIH	MIIH
38. Camissonia pygmaea	NA	NA	NA
39. Dermatocarpon luridum	NI	MIIH	MIIH
40. Lomatium ochocense	N/A	N/A	N/A
41. Mimulus evanescens	N/A	N/A	N/A
42. Penstemmon peckii	N/A	N/A	N/A
43. Rorippa columbiae	N/A	N/A	N/A
44. Scouleria marginata	NI	MIIH	MIIH
45. Thelypodium eucosmum	N/A	N/A	N/A
46. Thelypodium howellii ssp. howellii	N/A	N/A	N/A

Prepared by: /s/ _____/s/_____/s/_____

Approved by: /s/_____/s/_____/s/_____
Date: Wildlife Biologist Fisheries Biologist Botanist

NE	No Effect
LAA	Likely to Adversely Affect
NLAA	Not Likely to Adversely Affect
BE	Beneficial Effect
NLJ	Not Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat.
LJ	Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat.
NI	No Impact
MIIH	May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability to the Population Or Species
WIFV*	Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss Of Viability to the Population or Species
BI	Beneficial Impact
N/A	No Habitat or Species Present

***Trigger For A Significant Action As Defined in NEPA**
****Note: Rationale For Conclusion of Effect Is Contained In The NEPA Document.**

Form 2 (R-1/4/6-2670-9

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Appendix E

Comments Received In Response to the Proposed Action
February 2005

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Public Responder	Comment Received	Response
Letter 1: US Fish & Wildlife Service – Nancy Gilbert	1-1 Expand the descriptions of the "Functional Classification Analysis" used for pastures, in order to ensure that the process is repeatable in the future.	Appendix C of the EA explains the functional classification analysis procedure used for pastures.
Letter 2: Oregon Department of Fish & Wildlife – Brett Hodgson & Brian Ferry	2-1 The document does not clearly demonstrate how the proposed action will lead to the desired conditions and meeting standards outlined in the Ochoco Land & Resource Management Plan, INFISH, PACFISH, and ODEQ water quality standards in a timely manner.	Chapter 3 of the EA discusses the effects of the proposed action.
	2-2 Articulate quantifiably the protocol and anticipated outcomes of implementing the proposed action, including specific benchmarks and timelines.	Forest Service protocols for assessing resource conditions will be used. Outcomes of the Proposed Action are described in Chapter 3 of the EA. Benchmarks and timelines are unpredictable, dependent upon climate and site potential. Extensive research would be required to obtain this information.
	2-3 Consider more conservative standards for areas classified as functioning at risk to bring them to a properly functioning condition at an accelerated rate.	Under Alternative 2, the opportunity for more conservative standards for a pasture and/or allotment exists, under the guidance of the Adaptive Management framework. See page 23 of the EA.
	2-4 It is unclear how utilization will be monitored.	Utilization is discussed in the EA on pages 23, 32, 34 and 36.
	2-5 Monitoring frequency, standards and protocol should be clearly outlined using proven repeatable methodology.	Monitoring will be conducted using Forest Service protocols. See pages 23, 24, 32-35, 37, 42 and 43 of the EA.
	2-6 The Forest Service should be responsible for random sample compliance monitoring, using the same monitoring methodology as the permitee.	The Forest Service is responsible for compliance monitoring for the items that the permittee is monitoring. See page 33 of the EA where it states that the Forest Service will retain final responsibility for ensuring that implementation standards are met.
	2-7 The Forest Service should	See response to 2-5. Effectiveness

	develop protocols for both implementation and effectiveness monitoring, and utilize riparian exclosures to evaluate management actions and recovery rates.	monitoring will include plots and transects within maintained riparian exclosures to assess site potential and rates of recovery, where possible.
	2-8 The Forest Service should be highly engaged in implementation and effectiveness monitoring.	As stated on page 33 of the EA, the Forest Service will retain final responsibility for ensuring the implementation standards are met. Effectiveness monitoring is the responsibility of the Forest Service and is also discussed on page 33 of the EA.
	2-9 Monitoring should extend beyond “key areas” and include a representation of resource conditions throughout the allotments.	Implementation monitoring will be done by the permittees and the Forest Service at key areas and designated monitoring areas to determine actual use. These areas are ecologically representative of the entire pasture or are particularly sensitive to grazing impacts. Additional implementation monitoring may occur in these areas if they are not key areas and Forest Service personnel observe current season livestock impacts. The Programmatic BA also allows the Forest Service to initiate pasture moves when thresholds are reached in other areas of concern within the pasture. Effectiveness monitoring sites will also be representative and sensitive and will be monumented to track changes through time.
	2-10 Sensitive areas such as headwaters springs and seeps should be closely monitored to ensure resource recovery.	These areas may be chosen as key areas or designated monitoring areas due to their sensitivity to livestock grazing. The Programmatic Biological Assessment requires that stubble height in wet and moist meadows (including springs and seeps) be a minimum of 6 inches. Additional implementation monitoring may occur in these areas if they are not key areas and Forest Service personnel observe current season livestock impacts.
	2-11 Consider rest and rest-rotation management for non-functioning and functioning at risk pastures outside of Roba allotment.	Within Alternative 2, non-functioning pastures may receive rest (see pages 24 and 33 of the EA).

	2-12 Consider the use of more let down fences and/or wildlife friendly fences in the project area.	Fencing options may be considered when the Allotment Management Plans are revised.
Letter 3: Back Country Hunters & Anglers – Brian Maguire	3-1 Conflicts between cattle grazing and elk hunting.	Conflicts between various uses of National Forest lands are common. Opportunities to avoid or resolve these conflicts can be addressed should either of the action alternatives be selected. This comment was not considered a significant issue by the decision maker and was not considered in the analysis section.
	3-2 Consider grazing north slopes (primarily northern portion of the project area) prior to hunting season to eliminate conflicts with hunters.	The Forest Plan has been modified under the standards outlined in the biological opinion commonly referred to as PACFISH/INFISH. These standards preclude use of streams containing anadromous fish (north slopes of the District) from grazing until after July 15th each year. This includes the North Pasture of Happy Allotment and the West Pasture of Derr Allotment (see pages 24, 27 and 36 of the EA). Because of this, these pastures are grazed into August when the first hunting season (bow hunting) begins. Options to use these areas prior to hunting seasons can be explored within the standards outlined in the LRMP, as amended, under the action alternatives.
	3-3 Consider a pasture rotation system that allows for one pasture within each allotment to be free of cattle during hunting season.	Alternatives 2 and 3 both provide for one or more pastures to be free of cattle during hunting season, with the exception of Little Summit Allotment which only has one pasture.
	3-4 The decline of aspen due to livestock grazing.	This is addressed under Issue #1, Impacts to Riparian and Upland Vegetation. The effects to aspen are discussed in Chapter 3 of the EA on pages 56, 60 and 65.
Letter 4: Juniper Group of the Sierra Club – George Wilson	4-1 Reduce or eliminate grazing.	Alternative 1 (page 19 of the EA) addresses the elimination of livestock grazing. Both Alternatives 2 and 3 have the ability to reduce grazing numbers. See page 24 of the EA for Alternative 2 and page 35 of the EA for Alternative 3.
Letter 5: Oregon	5-1 Questionable NEPA process	It is the Agency's opinion that the 30

Natural Desert Association and Northwest Environmental Defense Center – Peter Lacy & Chaitna Sinha	that allows the 30 day comment period to occur prior to the completion of the EA.	day comment period may occur prior to the completion of the EA based upon 36 CFR part 215.5. This was also stated in the 30 day comment letter of 2/10/05.
	5-2 Consideration of an alternative that allows grazing to occur with limited numbers of cattle.	Alternative 2 provides the opportunity for grazing to occur with reduced numbers of cattle based on the previous years monitoring and climatic conditions. See page 24 of the EA. Alternative 3 also provides for changes in numbers of cattle, see page 35 of the EA.
	5-3 Insufficient maps.	Maps have been improved for the completed EA.
	5-4 Livestock grazing impacts to the Outstanding and Remarkable Values of the North Fork Crooked Wild and Scenic River.	This is addressed in the EA on page 18, as an "Other Concern Identified By the Public and IDT" and the effects to ORVs are discussed in Chapter 3 on pages 185-193.
	5-5 Grazing should be eliminated from the Wild & Scenic River Corridor to allow for recovery of Outstanding and Remarkable Values.	Alternative 1 would eliminate grazing from the Wild & Scenic River Corridor (see page 19 of the EA). The effects of Alternative 1 on ORVs are addressed in the EA on pages 185-186. Alternative 2 provides for 3 years of rest of the Roba Allotment, which includes most of the W&S River corridor in the project area. After the 3 years of rest, the Riparian Pasture of Roba would be rested every other year. Livestock grazing may impact vegetation ORVs (see pages 187-188 of the EA). The recent riparian PFC assessment is discussed on pages 183 and 184.
	5-6 Livestock grazing affects on 303d listed streams and compliance with water quality standards.	303d streams were identified as an "Other Concern Identified By the Public and IDT" on page 18 of the EA and the effects are discussed in Chapter 3 on pages 174-182.
	5-7 Consider using a 6 inch stubble height requirement for all functioning riparian areas, and increase the proposed stubble height standards for non-functioning and functioning at risk riparian areas.	Utilization (percent removal) or amounts of vegetation remaining (stubble height) are two means to monitor use on vegetation. The 4 inch stubble height is designed to provide protection to banks and is sufficient to achieve the desired condition (see pages 59 and 60 of the EA).

	5-8 Consider using a 90% bank stability standard instead of a 10% bank damage standard.	The Programmatic Biological Assessment requires the Forest Service to move livestock when 10% bank alteration is reached within key area. PACFISH/INFISH RMOs require attainment of greater than 80% streambank stability throughout a streams' length. The effects to stream channel stability and the rate of attainment of these standards are described in Chapter 3 of the EA. Bank alteration may or may not cause unstable streambanks. Even if all alteration did cause unstable banks, this threshold would still ensure that streams move toward achieving the 80% standard. Some stream types are not inherently capable of achieving 90% bank stability. Effectiveness monitoring will determine exactly how well the selected Alternative moves functioning at risk and non-functioning stream reaches toward achieving the greater than 80% bank stability standard, as well as rates of recovery.
	5-9 Methodology for determining soil disturbance needs to be provided.	Soil disturbance is determined using Forest Service protocol. It may be determined using direct measurements along a transect or an ocular estimate.
	5-10 Monitoring should be done by the Forest Service and not the permittee.	Implementation monitoring would be done by both the permittee and the Forest Service while effectiveness monitoring would be done by the Forest Service. The Forest Service reserves the ultimate responsibility for ensuring allowable use standards are met. See pages 33-35 of the EA for discussions of Alternative 2 and pages 42-43 of the EA for Alternative 3.
Letter 6: Crooked River Weed Management Area – Debra Bunch	6-1. The proposed action lacks discussion of management options such as changing season of use, duration of grazing or temporary fencing that could facilitate recovery of the Roba allotment without requiring the permitee to find alternative grazing.	These management options may be considered when the Annual Operating Instructions are discussed and when the Allotment Management Plans are revised. In addition there are three references to fencing in the EA for the Proposed Action (Alternative 2). See page 24 where there is a discussion of Numbers and Season of Use; page 23 where the use of a temporary fence is mentioned as a strategy that permittees may use to manage livestock use; and page 32 where there

		is mitigation measure under Soils giving the option to use temporary fencing.
Letter 7: Oregon Natural Resources Council – Doug Heiken	7-1. The rate of recovery for degraded streams is being retarded.	The relative rates of recovery for stream channel habitat is displayed in Table 27 (page 150 of the EA), and a summary of rate of attainment of PACFISH/INFISH RMOs is provided for each Alternative (see pages 137, 145 and 148 of the EA).
	7-2. Livestock grazing favors the growth of conifers that represent ladder fuels.	The general effects of livestock grazing on conifers is discussed in the EA on page 56.
	7-3. The effects of livestock grazing on forest health.	See response to 7-2 above.
	7-4. The suitability of livestock grazing.	Suitability is addressed at the Forest Plan level and is not a project level decision. See page 3 of the EA.
	7-5. The allocation of more forage to big game to prevent displacement on private lands.	Alternative 1 results in more forage being available for big game (by eliminating grazing). See pages 160 of the EA.
	7-6. Livestock grazing is inconsistent with the Wild and Scenic River designation.	Page 11 of the North Fork Crooked River Management Plan (1993) discusses how livestock grazing will continue within the Wild & Scenic River corridor, with changes to the grazing program being done through annual operating plans and revised Allotment Management Plans.
	7-7. Livestock grazing should not retard the recovery of sage grouse or any special status species.	Effects on special status species are included in Chapter 3 of the EA, beginning on page 98, with sage grouse being discussed on page 118. Also see Appendix D, TE&S Biological Evaluation Conclusion of Summary of Effects.

Appendix F

Habitat Types

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Photo 1: Low Sagebrush, south end Deep Creek Allotment, panoramic, facing west. August 2004.

Photo 2: Low Sagebrush, south end Deep Creek Allotment, facing west. August 2004.

Photo 3: Low Sagebrush, south end Deep Creek Allotment, close-up, facing west. August 2004.

Photo 4: Low Sagebrush, south end Deep Creek Allotment, facing west, forb production.
August 2004.

Photo 5: Low Sagebrush, south end Deep Creek Allotment, grass and forb mix. August 2004.

Photo 6: Mountain Big Sagebrush, NW end Little Summit Prairie, facing west. September 2004.

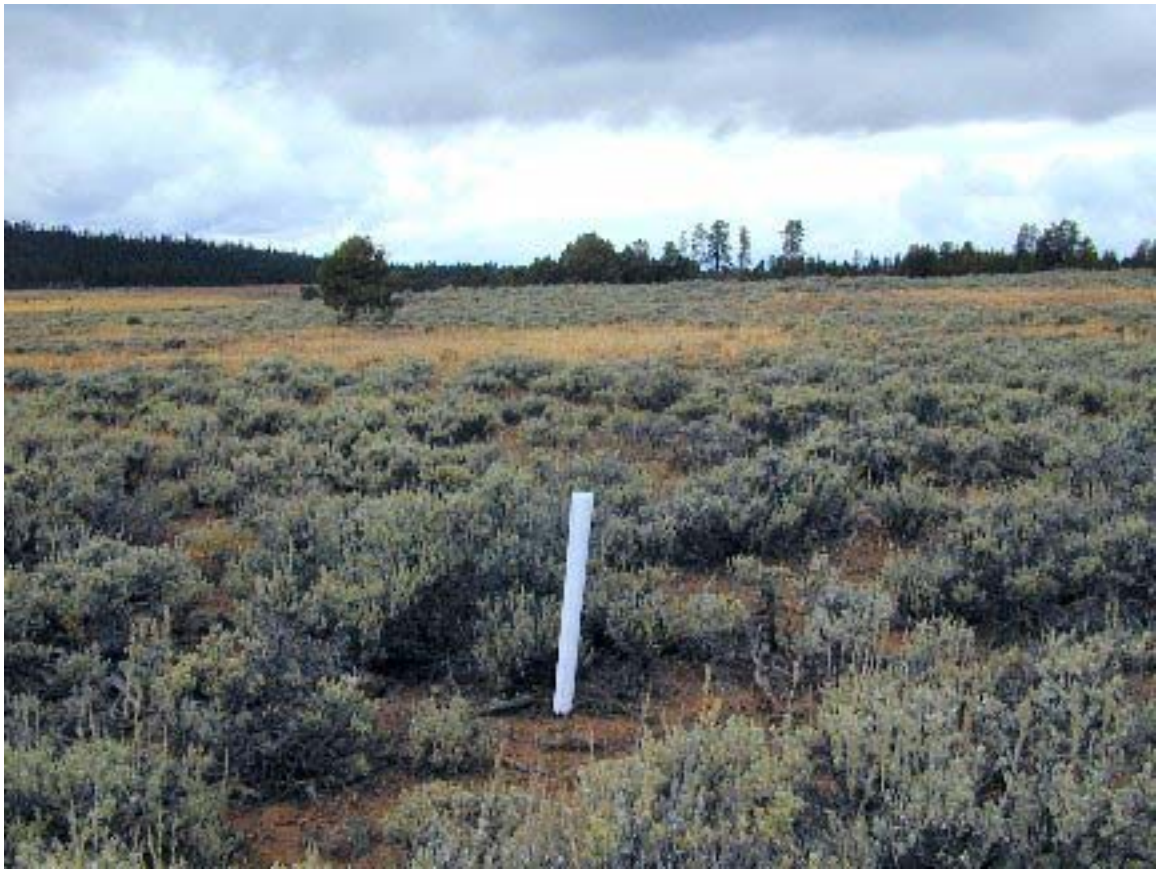

Photo 7: Mountain Big Sagebrush, NW end Little Summit Prairie, facing east. September 2004

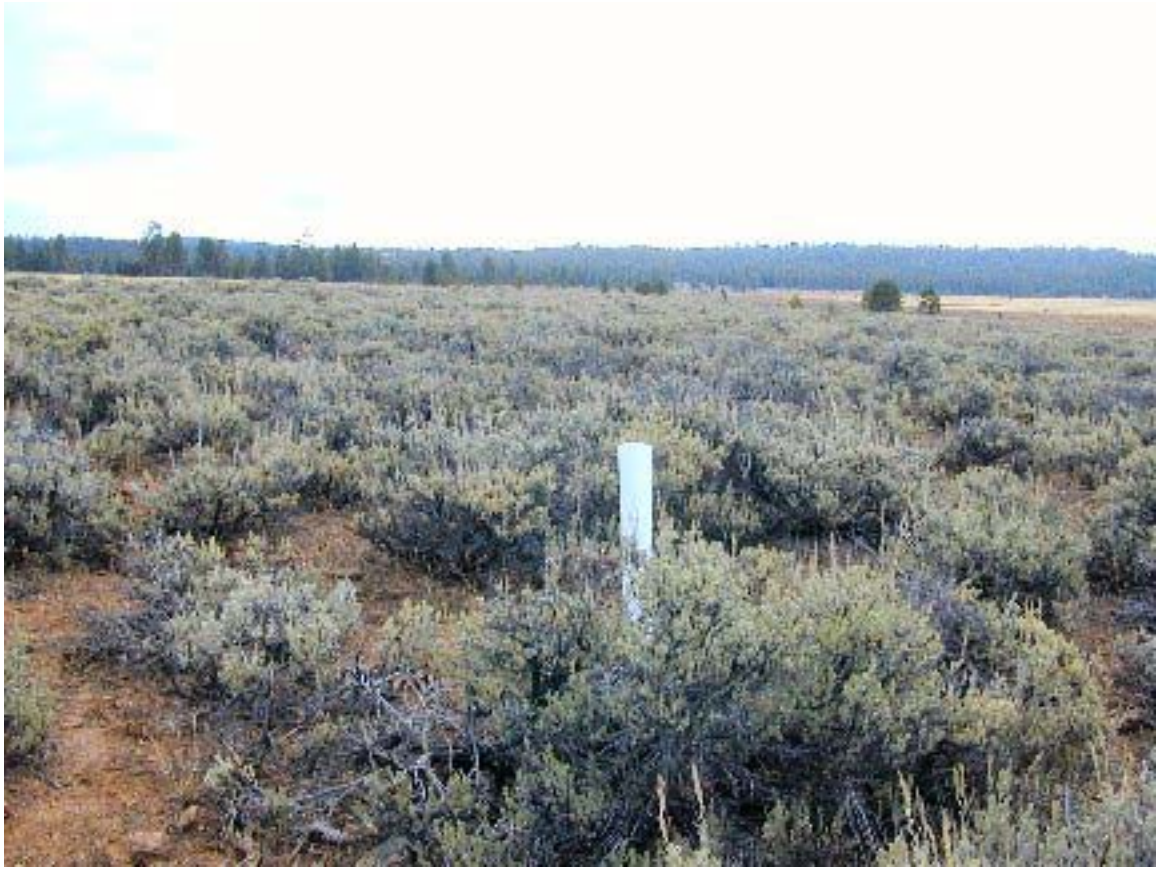

Photo 8: Mountain Big Sagebrush and conifer encroachment, NW end Little Summit Prairie, facing north.
September 2004

Photo 9: Mountain Big Sagebrush and Little Summit Prairie, facing south. September 2005

Photo 10: Wide Angle, Mountain Big Sagebrush and Conifer Encroachment, Wide Angle, south Deep Creek Allotment, south of USFS 42 road. August 2004.

Photo 11: Mountain Big Sagebrush Hummocks of south end of project area, south end Deep Creek Allotment. August 2004.

Photo 12: Mountain Big Sagebrush Hummocks of south end of project area, south end Deep Creek Allotment.
August 2004.

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