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Forest Service
Pacific Northwest Region

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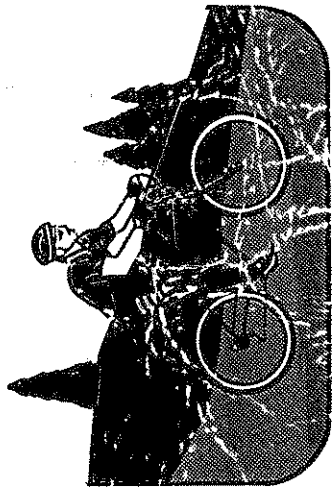
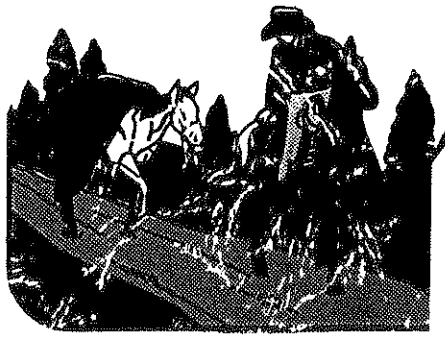
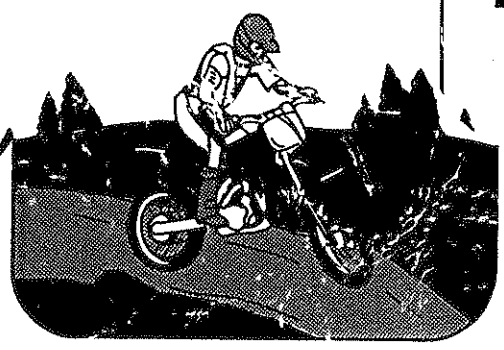
Trail System & Off-Highway Vehicle Management and Development

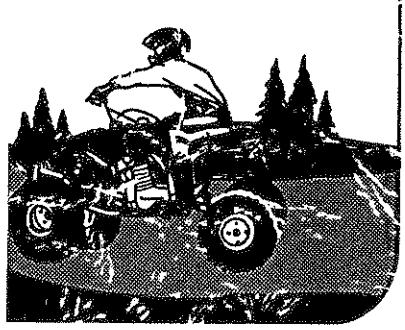
Final Environmental Impact Statement

Ochoco National Forest and Crooked River National Grassland









RECORD OF DECISION

Trail System and Off-Highway Vehicle Management and Development Final Environmental Impact Statement

Crook, Grant, Jefferson, Harney, and Wheeler Counties, Oregon
USDA Forest Service, Ochoco National Forest and
Crooked River National Grassland
Prineville, Oregon

INTRODUCTION

The use of off-highway vehicles (OHVs), snowmobiles, horseback riding, mountain bikes, skiing, and hiking has becomes increasingly popular on the Ochoco National Forest and Crooked River National Grassland in the last ten years. Past and current use has resulted in soil erosion and compaction, damaged vegetation, wildlife disturbance, user conflict, non-system trail networks including hill climbs, and dissatisfied forest visitors. Since the Henderson Flat All-Terrain Vehicle Area was developed in 1987, use of OHVs has been controversial. Public comments during the Forest Planning process and during the Travel Access scoping of 1991 confirmed that the issues were not resolved. Executive Order 11644 (use of Off-Road Vehicles on Public Lands) as amended by Executive Order 11989, and a subsequent letter from the Chief of the Forest Service affirm that OHVs are a legitimate use of public lands and should be allowed under conditions that protect other natural resources and are not in conflict with other forest uses.

The Trail System and Off-Highway Vehicle Management and Development Final Environmental Impact Statement (FEIS) analyzes the effects of motorized and non-motorized trail use upon other natural resources. A range of alternatives was analyzed that explores various options for allowing multiple trail and off-trail uses and their effects upon other natural resources.

One of the purposes of the environmental analysis was to clarify Forest Policy and Standards and Guidelines for motorized and non-motorized recreation travel on and off forest roads and trails. Existing direction was unclear and further confused by the Forest Travel Map and Travel Guide. In addition, the FEIS develops a comprehensive, managed, maintained, and monitored trail program. The program includes direction for non-motorized and motorized uses which are both consistent with the existing Land and Resource Management Plans and meets the needs of recreation visitors. It also incorporates interim direction for protection of anadromous and non-anadromous streams and adjacent riparian areas. The framework developed provides guidelines for designation, construction, and use of motorized and non-motorized recreation travel to provide a high quality recreation experience while protecting natural resources

The goals of the Proposed Action and Management Plan are to:

1. Minimize disturbance to wildlife including threatened, endangered, and sensitive species and their habitat;
2. Minimize conflicts between forest users and neighboring private land owners by addressing noise, trespass, and vandalism;
3. Provide a variety of trail opportunities that best meet the mix and demand of current and projected trail uses for the next 10 years;
4. Minimize damage to soils, riparian areas, and cultural resources;
5. Minimize disturbance and damage to vegetation including threatened, endangered, and sensitive species;
6. Promote safety of all trail users on public lands through education programs, signing, and public contacts.

Issues addressed are defined by three key areas: (1) Social Issues; (2) Administrative and Permittee (Commodity Uses) Issues; and (3) Resource Considerations. Within these three key areas there are specific issues addressed in the FEIS. These include: (1) user conflict, trail user concerns, hunting, special events, user safety, impacts to adjacent landowners, and trail development and off-trail use opportunities; (2) administrative and permittee use including all types of permittee access; and (3) travel route management to protect wildlife, fish, plants, soils, and threatened, endangered, and sensitive species.

LOCATION OF PROPOSED ACTIONS

The proposed action encompasses the entire Ochoco National Forest and Crooked River National Grassland, approximately 963,597 acres. The analysis area is contained within Crook, Grant, Jefferson, Harney, and Wheeler Counties in Oregon. Major towns located near the analysis area include Burns, Prineville, Madras, Mitchell, and Paulina.

DECISION

Based upon analysis in the Final Environmental Impact Statement and public comments during the 45 day scoping period for the Draft Environmental Impact Statement, it is my decision to adopt Alternative D as the selected alternative. This Alternative allows for development of up to 500 miles of OHV trail, 314 miles of snowmobile trail and 397 miles of non-motorized trail. It also allow off-designated route motorized travel in General Forest Management Areas (MA-F22) except in riparian areas, scablands, and sensitive soils. This alternative also changes management direction in Bandit Springs Management Area by limiting motorized use to designated routes year round, and limits use of motorized vehicles in dispersed campsites to entry and exit of the campsite. It is my decision to amend specific parts of the Ochoco National Forest and Crooked River National Grassland Land and Resource Management Plans of 1989, in order to implement Alternative D.

Actions selected that were common to all alternatives including Alternative D include:

* Provide information to trail users at trailheads and other locations concerning use restrictions and appropriate user behavior. Emphasize TREAD LIGHTLY programs to educate users. Implement the Trail Education and Enforcement Plan in Appendix E of the FEIS.

* To help people understand what types of users may be encountered on designated trails, brochures, Recreation Opportunity Guides, and trail maps will clearly state trail difficulty level and accepted trail users.

* Minimum Forest Service Regional Sign standards as described in Standards for Forest Service Signs and Posters (EM-700-15) will be implemented. All existing and planned trails will have an approved sign plan. This sign plan will be implemented on-the-ground before a trail is open to the public. This signing will allow people to know what kind of trail users are allowed on each trail and also emphasize a trail courtesy message.

* Monitor trail use to determine use patterns, trends, and conflict situations.

* All existing and planned Forest and Grassland trails will have approved Trail Management Objectives (TMOs) or be closed to all uses until TMOs are completed and approved. The TMOs will clearly state which types of trail uses are permitted, including which specific types of motorized uses will be allowed.

* Conduct trail maintenance and condition surveys as specified in the Trail Management Objectives. Highest priority maintenance will be given to situations that may affect water quality or TES plant or animal species.

* State laws and regulations regarding allowable noise levels, muffler specifications and user safety equipment will be enforced by the Forest Service and State Highway Patrol.

* Partnerships and volunteer opportunities for constructing/reconstruction/ designating/ and maintaining trails, user education and monitoring will be emphasized.

* Special Events including endurance rides and competitive rides for both motorized and nonmotorized uses will be evaluated through the existing Special Uses permitting process. This includes completion of an environmental analysis prior to approving an event. Of primary concern is the ability to handle large events (parking and impacts of many users in one area).

* When developing trails near private lands, consult with the landowner during the project planning stage. Avoid building trails directly adjacent to private lands. Post the National Forest boundary where trails are within 1/4 mile of private land. Avoid developing trails which parallel private land for long distances.

* Administrative use in areas closed to OHV off-trail/road travel will be allowed on a case-by-case basis for inventory, monitoring, restoration, and activity planning such as timber sales.

* Locate no more than 10% of new motorized and non-motorized trails within riparian areas and no more than 20% of new motorized and non-motorized trails within scablands.

* Minimize trail locations in riparian areas except in specific areas where topography is extreme (rock formations, etc.) or it is desired to interpret or demonstrate riparian values to trail users.

* All Management Areas closed to motorized travel, or motorized travel off designated routes in the existing Forest and Grassland Plans will remain closed.

* Promote trail structures, including stream crossings that minimize disturbance to Class I-IV streams and moist/wet areas, consistent with Riparian Management Objectives.

* Forest and Grassland road/ trail density Standards and Guidelines will remain as specified in the Ochoco National Forest and Crooked River National Grassland LRMPs.

In addition to the above actions, Alternative D also allows the following:

* The development of up to 7 days worth of OHV riding opportunities, or approximately 500 miles of well designed, diverse OHV trail with at least one staging area.

* A total of 314 miles of snowmobile trail (75 miles already exist). A total of 397 miles of non-motorized trail (137 exist).

* The Forest and Grassland would remain open to nonmotorized off-trail/road travel.

* Use of OHVs in dispersed campsites would be limited to entry and exit of the site on designated routes.

* Use of motorized vehicles, including OHVs will be limited to designated routes in Bandit Springs Management Area (MA-F16).

* Use of motorized vehicles, including OHVs would be limited to designated routes only on the Crooked River National Grassland.

* General Forest Management Areas (MA-F22) would remain open to motorized off-designated route travel with the following exceptions:
  riparian areas
  scablands- use allowed on existing two-track non-system roads
  sensitive soils including highly erodible slopes over 30% during wet weather from Dec 1 to May 1.

REASONS FOR THE DECISION

It is my decision to implement Alternative D because it provides the best mix of management options that allow a full range of trail and off-trail recreation uses while minimizing effects to other natural resources. This alternative provides the most recreation opportunities while promoting public safety and resource protection through monitoring and user education.

Alternative D, actions that were common to all alternatives more clearly emphasizes the Forest Service and visitor responsibilities of recreation trail use.

Alternative D allows additional development of OHV trails (310 more miles than the Forest Plan) to meet expanding motorized recreation needs. Motorized vehicles can cover many more miles per day than non-motorized users, therefore they need more miles of trail to meet their needs. Alternative D allows approximately 7 days of motorized trail opportunity. Five hundred miles of motorized trail would also encourage riders to stay on the trail, reducing impacts to non-trailed areas.

Planned non-motorized trail mileage remains the same as suggested in the Forest and Grassland Land and Resource Management Plans because it sufficiently meets the needs of non-motorized trail users.

The Forest and Grassland remain open to non-motorized off-trail uses because these uses have not been shown to cause significant resource damage.

Off-Highway Vehicle use in dispersed campsites will be restricted to entry and exit of the campsite. This includes both Dispersed Recreation (MA-F14 and MA-G14) identified in the Forest and Grassland plans, and all other dispersed sites in the analysis area. Most of these campsites are located in sensitive areas such as scablands and riparian areas and are not hardened to protect these resources. Concentrated OHV use in these areas has caused damage to vegetation, soil erosion, and may affect attainment of Riparian Management Objectives.

All motorized use in the Bandit Springs Management Area (MA-F16) will be limited to designated routes only. This Management Area was meant to be a non-motorized recreation area year-round. Existing direction in the LRMP was confusing and could be construed to allow summer OHV use. This use could affect sensitive plants and soils in the area.

On the Crooked River National Grassland OHV use is limited to designated routes only, as specified in the Grassland LRMP. Lack of vegetation to control use and implement motorized closures makes management of OHVs on the Grassland difficult. Clear direction and the development of specified trails will protect natural resources.

Existing direction in the Ochoco National Forest Land and Resource Management Plan that allows motorized off-designated route travel in General Forest (MA-F22) would continue with the stated exceptions for riparian, scablands, and sensitive soils. These additional restrictions on off-designated route motorized travel will assist in attainment of Riparian Management Objectives and protect sensitive vegetation and soils. Analysis in the FEIS shows that the current direction which allowed off-designated route motorized travel had negative impacts to less than .0001% of the analysis area, which is non-significant. Implementation of the Monitoring Plan (Appendix D) will ensure that any resource damage is stopped before it becomes significant and will be rehabilitated.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is Alternative F. Alternative F would allow construction of 250 miles of OHV trail and would not allow any motorized off-designated route use on the Forest or Grassland. This alternative would cause the least disturbance to soils, wildlife, vegetation, and riparian areas. However, this alternative does not provide for maximum recreation trail and off-trail opportunities for motorized uses. It also limits hunter access.

OTHER ALTERNATIVES CONSIDERED

Six alternatives were considered in the FEIS including the selected alternative (D) and the environmentally preferred alternative (F). This section explains the content of the four alternatives not already discussed.

Alternative A would continue to manage, develop, designate, and maintain trails as described in the Ochoco LRMP, including Appendix A-9 (page A-14) and the National Grassland LRMP, including Appendix A3 (page A-3). A total of 898 miles of motorized and non-motorized recreation trail would be built (190 miles would be motorized). The Forest would be open to motorized off-designated route travel in General Forest (MA-F22), Dispersed Recreation (MA-F14), and Bandit Springs Management Area (MA-F16). The Grassland would not be open to off-designated route motorized travel. This alternative was not chosen because it did not provide the highest quality motorized recreation trail opportunities, did not implement the intent of the Bandit Springs Management Area as a non-motorized recreation area, and did not ensure attainment of Riparian Management Objectives in Dispersed Recreation areas.

Alternative B would implement the existing Forest and Grassland travel direction as shown on the Forest Travel Map. No new trails would be built. This alternative was not chosen because it is confusing both the Forest Service managers and the public as to where recreation motorized travel is and is not allowed. It contradicts the existing Forest and Grassland LRMP, and it does not sufficiently meet motorized trail demand or non-motorized trail demand for barrier-free trails and interpretive trails.

Alternative C would allow for the development of 3.5 days of OHV riding (about 250 miles of trail); develop 314 miles of snowmobile trail, and develop 397 miles of non-motorized summer trail. The General Forest Area (MA-F22) would be open to motorized off-designated route travel except in riparian areas, scablands, and sensitive soils. Motorized travel in Bandit Springs Management Area (MA-F16) would be limited to designated routes only. Use of OHVs in dispersed campsites would be limited to entry and exit of the site on designated routes. This alternative was not chosen because it did not fully maximize OHV trail opportunities which may have lead to more off-designated route motorized travel in sensitive areas.

Alternative E was similar to Alternative F but would develop 7 days of OHV riding opportunity (about 500 miles). All motorized travel, except snowmobiles, would be permitted on designated routes only, except for administrative use which would be allowed on a case-by-case basis with District Ranger approval. Permittee travel with motorized vehicles would be limited to designated routes only. This alternative was not selected because it was too

restrictive of motorized recreation and permittee use. There was not sufficient evidence in the FEIS analysis to show that these uses, as currently allowed resulted in significant resource damage to wildlife, plants, soils, cultural resources, and vegetation.

RELATIONSHIP TO OCHOCO AND GRASSLAND LRMP

This FEIS and management plan both clarifies and amends the Ochoco National Forest and Crooked River National Grassland Land and Resource Management Plans.

The FEIS is available for review at the Ochoco National Forest Supervisors Office, and District Offices in Burns, Paulina, Prineville, and Madras.

AMENDMENTS MADE TO THE OCHOCO AND GRASSLAND LRMP

In addition to implementing Alternative D, this decision also constitutes an Amendment to the Ochoco National Forest and Crooked River National Grassland Land and Resource Management Plans. The purposes of the Amendment to the LRMP are to:

1) Change management of the Bandit Springs Management Area (MA-F16) by changing the existing Standard and Guideline that reads:

> Over snow motorized use restricted to designated routes from Dec 1 to March 30 (page 4-234)

And change this to read:

> Motorized use restricted to designated routes.

2) Change the management of Dispersed Recreation Management Areas (MA-F14) by changing the existing Standard and Guideline that reads:

> Motorized use encouraged on designated routes and areas (page 4-235)

And change this to read:

> Motorized use restricted to designated routes.

3) allow for additional OHV trail development (from 190 miles to 500 miles).

4) change where off-designated route motorized use may and may not occur in General Forest management Areas (MA-F22) by changing the existing Standards and Guidelines which state:

> Motorized use encouraged on designated routes and areas (page 4-235)

And change this to read:

> Motorized use encouraged on designated routes and areas and restricted to designated routes only in riparian areas. Motorized use restricted to designated routes on sensitive soils including highly erodible slopes over 30% during wet weather from Dec 1 to May 1. Motorized use on scablands restricted to designated routes and existing two-track non-system roads.

IMPLEMENTATION

Implementation of this decision may begin 7 calender days after the Record of Decision appears in the Bend Bulletin.

Construction of specific trails identified in the Management Plan will require additional environmental analysis prior to implementation with the appropriate levels of analysis in compliance with the National Environmental Policy Act and Forest Service requirements.

PUBLIC INVOLVEMENT

Public involvement has occurred for this FEIS and management plan since 1990. The most recent public involvement was public review of the DEIS from August to October 1995. In March 1995, scoping letters were mailed to public and a Notice of Intent was published in the Federal Register. The original Notice of Intent was published in the Federal Register in March 1991. Past public involvement regarding Travel Access on the Forest and Grassland occurred from 1990-1992 including over 30 public meetings. All comments received were used to define the issues. A public involvement plan is contained in the analysis file.

RIGHTS TO APPEAL

This decision is subject to appeal pursuant to 36 CFR 217. Any written Notice of Appeal of this decision must be fully consistent with 36 CFR 217.9 (Content of a Notice of Appeal) and must include the specific reasons for the appeal. A written Notice of Appeal, in duplicate, must be filed with the Reviewing Officer, Robert Williams, Regional Forester, P.O. Box 3623, Portland, Oregon 97208-3623, within 45 days of the date legal notice of this decision appears in the Bend Bulletin. For further information contact Sue Kocis, Ochoco National Forest, Recreation Planner at (541) 416-6530.

Responsible Official:

Thomas A. Schmidt 8/2/96

THOMAS A. SCHMIDT
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FINAL ENVIRONMENTAL IMPACT STATEMENT
AUGUST 1996

Trail System and Off-Highway Vehicle Management and Development for Ochoco National Forest and Crooked River National Grassland Crook, Grant, Jefferson, Harney, and Wheeler Counties State of Oregon

Abstract: The Ochoco National Forest would allow development of up to 500 miles of off-highway vehicle (OHV) trail, 397 miles of non-motorized trail, 314 miles of winter snowmobile trail, and allow off-designated route motorized use in General Forest Management Areas (MA-F22) only. Within this Management Area riparian areas, scablands, and slopes over 30% would be protected. Visitor education, signing, and partnerships would be emphasized. Bandit Springs Management Area (MA-F16) and dispersed campsites would limit motorized travel to designated routes only. This requires an Amendment to the existing Ochoco National Forest Land and Resource Management Plans. Six alternatives were considered: (A) existing Forest and Grassland Plan direction; (B) No Action; (C) allow for the development of up to 250 miles of OHV trail and allow off-designated route motorized use in MA-F22; (D) allow for the development of up to 500 miles of OHV trail and allow off-designated route motorized use in MA-F22; (E) allow for the development of up to 500 miles of OHV trail, off-designated route motorized use not allowed; (F) allow for the development of up to 250 miles of OHV trail, off-designated route motorized use not allowed except for permittees, administrative use, and hunters retrieving game. Alternative D is the agency selected alternative. Alternative F is the environmentally preferred alternative.

Responsible Official: Thomas A. Schmidt, Forest Supervisor
Ochoco National Forest
P.O. Box 490
Prineville, OR 97754

For further information, contact: Sue Kocis
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Prineville, OR 97754;(541) 416-6530

SUMMARY
FINAL ENVIRONMENTAL IMPACT STATEMENT ON
TRAIL SYSTEM AND OFF-HIGHWAY VEHICLE MANAGEMENT AND DEVELOPMENT
OCHOCO NATIONAL FOREST & CROOKED RIVER NATIONAL GRASSLAND

This final environmental impact statement (FEIS) analyzes the development and management of the Ochoco National Forest and Crooked River National Grassland trail system and effects of motorized and nonmotorized trail use. The Analysis Area is located in central Oregon, encompasses 963,957 acres within Crook, Grant, Jefferson, Harney, and Wheeler counties. The proposed action is to allow for the development of up to 500 miles of off-highway vehicle (OHV) trail, 314 miles of snowmobile trail, and 397 miles of nonmotorized trail. Off-designated route motorized use would be allowed in General Forest Management Areas (MA-F22) only. Within this management area off-designated route use would not be permitted in riparian areas, scablands (except for existing routes), or slopes over 30%. No more than 10% of new trails would be located in riparian areas and 20% in scablands. Visitor education, signing, understandable travel maps, use of volunteers, and partnerships are emphasized. Bandit Springs Management Area (MA-F16) and Dispersed Recreation (MA-F14) would limit motorized travel to designated routes only. This will require an amendment to the existing Forest and Grassland Land and Resource Management Plans.

Permittee use of motorized vehicles off-designated routes would be permitted under the terms of their forest permits. Administrative use of motorized vehicles off-designated routes would be permitted with District Ranger discretion. Private landowners would be consulted during trail development to mitigate any concerns about trespass or vandalism to their private property. PacFish and Inland fish interim guidelines for protection of fish and water quality are incorporated into trail and off-designated route standards and guidelines.

PURPOSE AND NEED FOR ACTION

The purpose and need of the proposed actions is to resolve OHV use issues and to provide both motorized and nonmotorized trail opportunities and off-designated route opportunities while protecting natural resources, promoting public safety, and minimizing user conflicts. The objectives of the proposed action are to minimize disturbance to wildlife, soils, riparian areas, cultural resources, vegetation, and threatened, endangered, or sensitive species.

Current off-designated route motorized travel is not controlled and resulting in resource damage. Motorized trail demand is not currently met. Clear management direction is lacking. The existing Forest Plan standards and guidelines conflict with the existing Forest Travel Map. Travel direction is unclear both internally and externally. There is a need to provide clear, easily understandable, and implementable travel direction.

PUBLIC INVOLVEMENT

Public scoping for this FEIS occurred from August thru October 1995, and in 1991-2 during Forest Travel Access planning. Fifty-eight responses were received during the most recent scoping. Issues and concerns from the public regarding the DEIS were addressed in this FEIS.

ISSUES

Issues were developed from past public scoping for Travel Access, from public response to scoping in March 1995, and internal concerns. No new issues were raised during the DEIS comment period. Issues addressed include Social Issues, Administrative and Permittee Travel Issues, and Biological Issues.

Social issues deal with trail demand and supply, user conflicts, visitor values and value conflicts, special events, and private landowner concerns. User conflict is primarily between motorized and nonmotorized trail users. People desiring a primitive nonmotorized setting feel their experience would be diminished by the sights and sounds of motorized vehicles. Motorized users feel they the Analysis Area provides insufficient motorized recreation opportunities leading to unregulated motorized use and resource damage.

Administrative and permittee issues include use of motorize vehicles off-designated routes to do work and gather forest products including firewood. Regulations that restrict where and when permittees may use motorized vehicles off-designated routes may increase the time and cost of doing their work.

Biological issues include the effects of trail construction, trail use, and off-designated route motorized use on water quality, fish, riparian habitat, soils, vegetation, and wildlife.

RANGE OF ALTERNATIVES

Six alternatives were developed to respond to the issues and concerns. These include Alternative A which is the Forest Plan alternative and Alternative B which is the No Action alternative. Alternatives C through F provide a range of motorized trail opportunities and off-designated route opportunities. Alternatives C and D allow off-designated motorized travel in General Forest Management Areas (MA-F22). Mitigation measures include no off-designated route travel in riparian areas, scablands, or slopes over 30%. Alternative D would allow off-designated route travel in scablands on existing roads and nonsystem two-tracks. Alternatives E and F would limit motorized use to designated routes throughout the Analysis Area. Alternative E would also limit permittee motorized travel and hunter motorized travel to designated routes only. Alternatives C and F would allow for the development of up to 250 miles of OHV trail. Alternatives D and E would allow for the development of up to 500 miles of OHV trail. Alternatives A, C, D, E, and F would allow for the development of up to 397 miles of nonmotorized trail.

Alternative D is the Agency Preferred alternative. Alternative F is the environmentally preferred alternative.

RESPONSIVENESS OF THE ALTERNATIVES TO THE ISSUES

The major area of controversy is where and when OHV use would be allowed within the Analysis Area. The effects of OHV use on natural resources and other recreation opportunities are a concern. Mitigation measures are developed to resolve some controversy and protect natural resources. The following summary discloses the effects of each alternative.

Issue 1: Social Issues

Recreation Opportunities provided:

Alternative A: Off-highway vehicle trail demand is partially met. All other trail opportunities are fully met. Fifty-two percent of the analysis area is open to off-designated route motorized use. Provides a moderate amount of hunter motorized access. OHV use allowed in dispersed campsites.

Alternative B: Off-highway vehicle trail demand is not met. Trail opportunities for snowmobiles and interpretive trails are partially met. All other trail opportunities are fully met. Eighty-one percent of the analysis area is open to off-designated route motorized use. Provides a large amount of hunter motorized access.

Alternative C: All trail demand is fully met. Thirty-nine percent of the analysis area is open to off-designated route motorized use. Provides a moderate amount of hunter motorized access. OHV use not allowed in dispersed campsites except for access.

Alternative D: All trail demand is fully met. Forty-five percent of the analysis area is open to off-designated route motorized use. Provides a moderate amount of hunter motorized access. OHV use not allowed in dispersed campsites except for access.

Alternative E: All trail demand is fully met. The analysis area is closed to off-designated route motorized use. Does not provide for hunter motorized access off-designated routes. OHV use not allowed in dispersed campsites except for access.

Alternative F: All trail demand is fully met. The analysis area is closed to off-designated route motorized use. Hunter motorized access off-designated routes to retrieve game only. OHV use not allowed in dispersed campsites except for access.

Ease of Understanding and Implementing Travel direction:

Alternative A: The variety of travel closures makes this alternative difficult to sign, implement, and understand travel direction.

Alternative B: The variety of travel closures makes this alternative difficult to sign, implement, and understand travel direction.

Alternative C: Moderate difficulty in implementing and understanding travel direction.

Alternative D: Moderate difficulty in implementing and understanding travel direction.

Alternative E: Easy to implement and understand travel direction.

Alternative F: Easy to implement and understand travel direction.

Risk of non-compliance:

Alternative A: High risk of non-compliance due to difficulty of understanding travel direction, implementing on-the-ground signing, and not fully meeting OHV trail needs.

Alternative B: Highest risk of non-compliance due to difficulty of understanding travel direction, implementing on-the-ground signing, and not meeting OHV trail needs.

Alternative C: Moderate risk of non-compliance, meets basic trail needs and leaves some area open to off-designated route use.

Alternative D: Moderate risk of non-compliance, meets trail needs and leaves 45% of area open to off-designated route travel

Alternative E: Minimum risk of non-compliance, clear policy of closed unless otherwise signed on-the-ground, meets trail needs.

Alternative F: Least risk of non-compliance, clear policy of closed unless otherwise signed on-the-ground, meets trail needs and allows hunter access to retrieve game.

ISSUE 2 - ADMINISTRATIVE AND COMMODITY (PERMITTEE) ACCESS

Alternatives A-D and F: Administrative and permittee off-designated route motorized access allowed under terms of permit.

Alternative E: Administrative access allowed. Permittee motorized access restricted to designated routes only.

ISSUE 3- BIOLOGICAL ISSUES

Soil displacement from trail construction and use:

Alternative A: Soil would be displaced on 231 acres through trail construction. Potential for 498,826 acres of soil to be disturbed from off-designated route motorized use.

Alternative B: Soil would be displaced on 39 acres from existing trails. Potential for 775,620 acres of soil to be disturbed from off-designated route motorized use.

Alternative C: Soil would be displaced on 278 acres from trail construction. Potential for 379,075 acres of soil to be disturbed from off-designated route motorized use.

Alternative D: Soil would be displaced on 460 acres from trail construction. Potential for 432,401 acres of soil to be disturbed from off-designated route motorized use.

Alternative E: Soil would be displaced on 460 acres from trail construction. No effects from off-designated route motorized

use.

Alternative F: Soil would be displaced on 278 acres from trail construction. No effects from off-designated route motorized use.

Protection of watershed/fish/riparian areas:

Alternative A: Moderate risk of impacts from trails; moderate risk of non-compliance causing resource damage; fair protection of aquatic resources from off-designated route uses.

Alternative B: Low risk of impacts from trails; high risk of non-compliance causing resource damage; poor protection of aquatic resources from off-designated route uses.

Alternative C: Moderate risk of impacts from trails; moderate risk of non-compliance causing resource damage; good protection of aquatic resources from off-designated route uses.

Alternative D: High risk of impacts from trails; moderate risk of non-compliance causing resource damage; fair protection of aquatic resources from off-designated route uses.

Alternative E: High risk of impacts from trails; very low risk of non-compliance causing resource damage; good protection of aquatic resources from off-designated route uses.

Alternative F: Moderate risk of impacts from trails; very low risk of non-compliance causing resource damage; very good protection of aquatic resources from off-designated route uses.

Wildlife habitat disturbed:

Alternative A: Would remove 231 acres of vegetation that may serve as wildlife habitat; trail construction would influence 4% of wildlife habitat; Second highest risk of overall disturbance to wildlife from trail construction and off-designated route use.

Alternative B: Would remove no new acres of vegetation; trail construction would influence 3% of area wildlife habitat; Highest risk of disturbance to wildlife and habitat.

Alternative C: Would remove 278 acres of vegetation that may serve as wildlife habitat; trail construction would influence 5% of area wildlife habitat; Overall moderate risk to wildlife.

Alternative D: Would remove 460 acres of vegetation that may serve as wildlife habitat; trail construction would influence 7% of

area wildlife habitat; Overall moderately high risk to wildlife.

Alternative E: Would remove 460 acres of vegetation that may serve as wildlife habitat; trail construction would influence 5% of area wildlife habitat; Overall second lowest risk to wildlife.

Alternative F: Would remove 278 acres of vegetation that may serve as wildlife habitat; trail construction would influence 7% of area wildlife habitat; Least risk of disturbance to wildlife and habitat.

Disturbance to vegetative resource and sensitive plants:

Alternative A: Vegetation on 231 acres removed for trail construction. Overall risk to vegetation resource and sensitive plants is high. Fifty-seven percent of riparian area, 34% of scablands, and 58% of forestlands could be effected cumulatively from roads, trails, and off-designated route use.

Alternative B: Vegetation on 39 acres removed for trail construction. Overall risk to vegetative resource and sensitive plants is very high. Eighty-eight percent of riparian areas, 70% of scablands, and 85% of forestlands could be effected cumulatively from roads, trails, and off-designated route use.

Alternative C: Vegetation on 278 acres removed for trail construction. Overall risk to vegetative resource and sensitive plants is moderate. Five percent of riparian areas, 3% of scablands, and 58% of forestlands could be effected cumulatively from roads, trails, and off- designated route motorized use.

Alternative D: Vegetation on 460 acres removed for trail construction. Overall risk to vegetative resource and sensitive plants is moderate. Five percent of riparian areas, 34% of scablands, and 58% of forestlands could be effected cumulatively from roads, trails, and off- designated route motorized use.

Alternative E: Vegetation on 460 acres removed for trail construction. Overall risk to vegetative resource and sensitive plants is low. Five percent of riparian areas, 3% of scablands, and 1% of forestlands could be effected cumulatively from roads and trails.

Alternative F: Vegetation on 278 acres removed for trail construction. Overall risk to vegetative resource and sensitive plants is very low. Five percent of riparian areas, 3% of scablands, and 1% of forestland could be effected cumulatively from roads and trails.

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CHAPTER I
PURPOSE AND NEED FOR ACTION

INTRODUCTION

This Final Environmental Impact Statement analyzes the effects of different amounts of motorized and non-motorized trail use upon other natural resources. The Draft Environmental Impact Statement was issued for public comment in August 1995. Based upon public comments, changes were made and incorporated into this FEIS. These changes are primarily supplements, improvements and/or modification of analysis in the DEIS, and factual corrections based upon new or updated analysis. No alternatives were substantively modified and no new alternatives were added as a result of public comments received. The changes between Draft and Final are highlighted at the beginning of each Chapter and discussed in Appendix J, Response to Public Comments. Appendices A, B, and C of the DEIS were deleted because the information was not specifically used in the FEIS or was incorporated by reference to other published documents.

The use of off-highway vehicles (OHVs), hiking, horseback riding, snowmobiling, skiing, and mountain bike riding has become increasingly popular in the last 10 years on the Ochoco National Forest and Crooked River National Grassland. Past and current use has resulted in soil erosion and compaction, damaged vegetation, wildlife harassment, user conflicts, non-system trail networks including hill climbs, and some dissatisfied forest visitors. Use of OHVs on the Ochoco National Forest and Crooked River National Grassland must be comprehensively addressed. Since the Henderson Flat All-Terrain Vehicle (ATV) area was developed in 1987, use of Off-Highway Vehicles (OHVs) has been controversial. Public comments during the Forest Planning process in 1988 and during the Travel Access scoping of 1991 confirmed that the issue was still not resolved. Lack of off-highway vehicle (OHV) opportunities and effects of OHV use on natural resources are critical issues to be addressed and resolved.

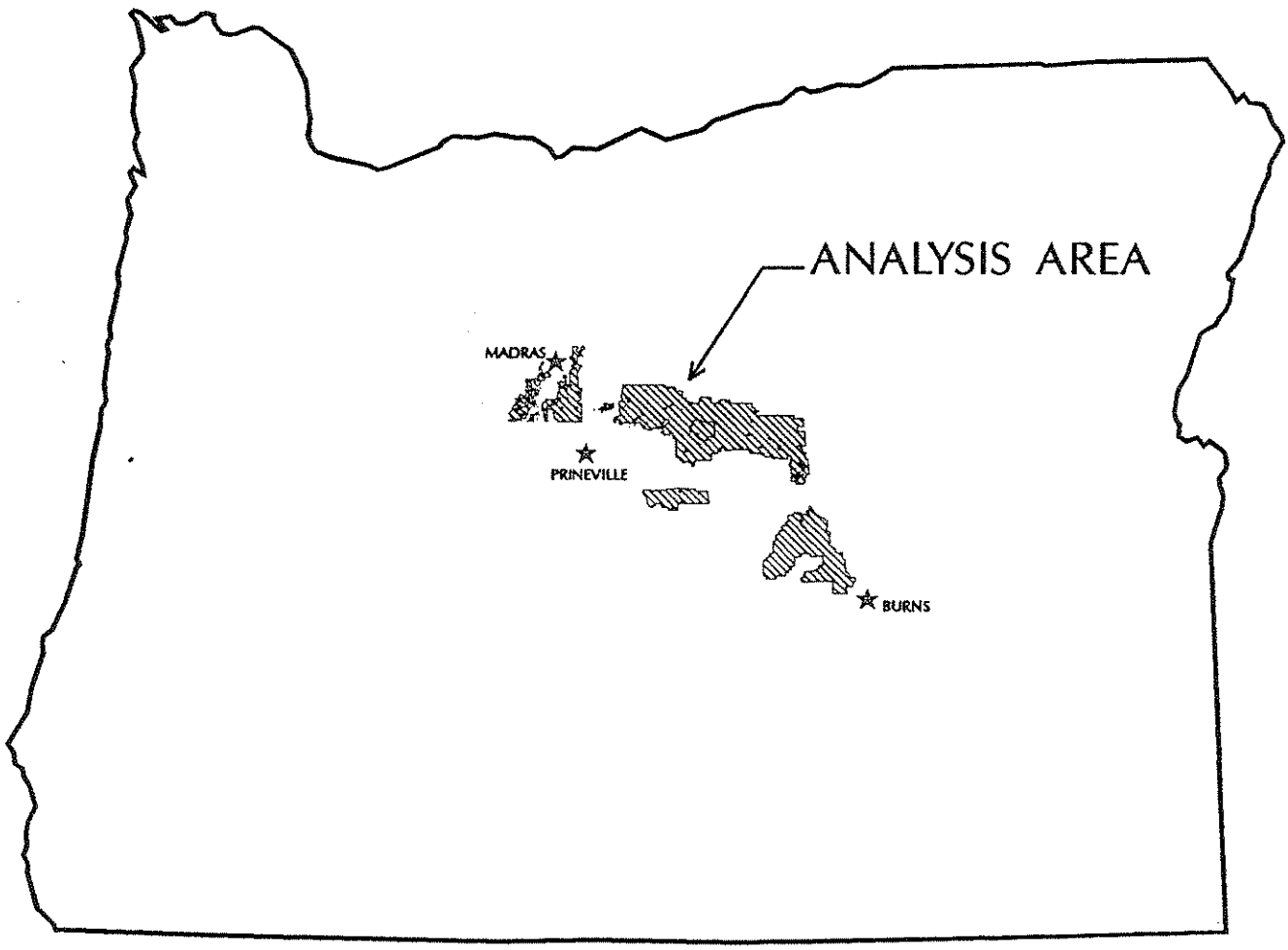
Executive Order 11644 (Use of Off-Road Vehicles on Public Lands) as amended by Executive Order 11989 gives the Forest Supervisor authority to designate portions of the public land open and closed to off-highway vehicle use:

> Sec.9.a. ...the respective agency head, whenever he determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trail of the public lands, immediately close such areas or trail to the type of off-road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

Forest Policy and Standards & Guidelines for motorized travel on Forest developed roads were clarified in the Forest Travel Map and Travel Guide (May 1993)). Forest Standards & Guidelines and Forest Policy concerning motorized off-designated route travel, and motorized travel on designated routes is unclear or conflicting in the Ochoco National Forest Land and Resource Management Plan (USDA 1989) and Crooked River National Grassland Land and Resource Management Plans (USDA 1989). These two management plans are referred to collectively throughout this document as LRMPs.

VICINITY MAP

OCHOCO NATIONAL FOREST AND CROOKED RIVER NATIONAL GRASSLAND IN THE USDA PACIFIC NORTHWEST REGION



FOREST SERVICE
U S
DEPARTMENT OF AGRICULTURE

PLOT DATE 08/03/95 PLOT SCALE NONE

The LRMPs completed in 1989, establish management area direction, desired future conditions and standards and guidelines for future activities throughout the Ochoco National Forest and Crooked River National Grassland. While the LRMPs identify OHV use as a suitable use of the National Forest and Grassland, current management may be insufficient to meet the users needs and protect natural resources.

The analysis area for this Final Environmental Impact Statement (FEIS) is the entire Ochoco National Forest and Crooked River National Grassland which encompass 963,597 acres. For purposes of this FEIS the words "Analysis Area" will be used instead of the entire Forest and Grassland names. The Analysis Area is located in Central Oregon, with Prineville Oregon being the headquarters office. More detailed descriptions of the physical, social, and biological features of the Analysis Area are contained in Chapter 3- Affected Environment and in the Ochoco National Forest Land and Resource Management Plan and Crooked River National Grassland Land and Resource Management Plans.

1.1 PROPOSED ACTION

The Ochoco National Forest and Crooked River National Grassland propose to develop a comprehensive, managed, maintained, and monitored trail program. This program will provide direction for non-motorized and motorized uses which are both consistent with the existing Land and Resource Management Plan direction and meets the needs of the trail users. The framework developed includes guidelines for designation, construction, and use of OHV routes and areas to provide a variety of high quality recreation opportunities. This framework would include the following:

* Allow for the development of approximately 7 days of OHV riding opportunity on designated trails (about 500 miles)

* Allow for the development of approximately 6.25 days of snowmobile riding opportunity on designated trails (314 miles)

* Allow for the development of approximately 3 to 42 days of various nonmotorized trail opportunity (397 miles)

* Locate no more than 10% of new trails (motorized and non-motorized) within riparian areas and no more than 20% of new trails on scablands.

* Increase the use of visitor education tools such as brochures, trail maps, and signing to reduce trail use conflicts and protect resources.

* Within Management Area MA-F22 (General Forest), OHV use off-designated routes would be allowed except in riparian areas, scablands and slopes over 30%. Within riparian areas and slopes over 30% OHV use is limited to designated routes. In scablands, off-designated route OHV use is limited to existing travel routes.

* Bandit Springs (MA-F16) and Dispersed Recreation (MA-F14): OHV use is restricted to designated routes. Snowmobile use permitted on designated routes only December 1 to March 30 on an adequate snow base.

* Use of OHVs while camping outside developed campgrounds will be restricted to entry and exit of camp area. At District Ranger discretion, certain dispersed camping areas (such as those in gravel pits) may permit OHV use on a case-by-case basis.

* Where trail user conflicts develop on designated trails, the primary trail use (as defined in the Trail Management Objectives) shall take precedence.

* Permittee (Commodity) use of OHVs off-designated routes permitted with a valid Special Forest Products permit, under the terms of the permit. This use permitted only in areas designated for motorized travel in the existing Ochoco National Forest LRMP and Grassland LRMP.

* Administrative use of OHVs allowed on a case-by-case basis with District Ranger approval.

* Sign trails within 1/4 mile of private land. Consult with private landowners near proposed trails during the trail planning phase and during project analysis and layout. Avoid construction of trails that parallel private land for long distances.

* Continue use of the existing Regional Special Use Permit process for proposed special events such as Endurance Rides and OHV rides.

* Promote stream crossing structures that minimize disturbance to Class I through IV streams, and be consistent with Riparian Management Objectives.

The Desired Future Condition for trails in the Analysis Area is:

Motorized and non-motorized trail opportunities will be provided in a variety of settings, sufficient to meet current and future trail demand, while protecting natural resources, promoting public safety, and minimizing conflicts between user groups. The immediate trail area will be natural appearing, but with some obvious man-made controls and structures to direct users, providing for user safety and resource protection. Opportunities for off-designated route use will be provided where they do not conflict with resource and area management objectives. All trail and off-trail users will fully understand and practice the principles of Tread Lightly and Leave No Trace.

1.2 PURPOSE

The purpose of these proposed actions is to resolve OHV use issues and to provide both motorized and non-motorized trail opportunities and off-designated route opportunities while protecting natural resources, promoting public safety, and minimizing user conflicts. Two major Travel Access concerns are addressed. The first concern is recreation travel on and off Forest and Grassland trails. Recreation travel includes all types of trail uses, hunting, and exploring. The second concern is non-recreation travel on and off developed roads and trails. This travel is done by grazing allotment permittees, holders of special forest product permits, loggers, and Forest Service employees. Allotment permittee uses include but are not limited to moving livestock, repairing or building fence, and developing livestock water

sources. Special forest product permittee uses include gathering cones, cutting boughs, or picking mushrooms. Forest Service employees do a variety of resource work including data gathering, monitoring, and administering contracts. In all cases motorized travel off-designated routes is of more concern than nonmotorized travel due to the higher potential for impacts to wildlife, fish, soils, and other natural resources.

Executive Order 11644 as amended by Executive Order 11989 was passed to assure that "each agency head develop and issue regulations and administrative instructions .....to provide for administrative designation of specific areas and trails in which the use of off-road vehicles may be permitted.... Those regulations shall direct that the designation of such areas and trails will be based upon the protection of the resources of the public lands, promotion of the safety of all users of those lands, and minimization of conflicts among the various uses of those lands." In addition, enforcement of off-road vehicle use standards is addressed in the Code of Federal Regulations, including 36 CFR 261.13(i) which grants Forest Service Law Enforcement Officers the right to enforce state laws regarding use of OHVs. Other applicable authority and direction regarding use of OHVs is found in 36 CFR 216.21(g) and 36 CFR 295, Use of Motor Vehicles Off Forest Development Roads.

This FEIS is programmatic. Site specific analysis for individual trail proposals will require a site specific environmental analysis. This additional analysis may occur several years after the decisions supported by the final EIS.

Changes proposed in this FEIS to the current Forest-wide Standards and Guidelines in the Forest and Grassland Land and Resource Management Plans may result in amendments to those plans. These amendments will be explained in the Record of Decision.

Objectives of the Proposed Action

1. Minimize disturbance to wildlife including threatened, endangered, and sensitive species and their habitats.

2. Minimize conflicts between forest users and neighboring private land owners by addressing noise, trespass, and vandalism.

3. Provide a variety of trail opportunities that best meet the mix and demand of current and projected trail uses for the next 10 years.

4. Minimize damage to soils, riparian areas, and cultural resources.

5. Minimize disturbance and damage to vegetation including threatened, endangered, and sensitive species.

6. Promote safety of all trail users on public lands through education programs, signing, and public contacts.

1.3 NEED

There is a need to provide a mix of trail recreation opportunities on the Forest and Grassland while protecting natural resources. Currently, the daily requirements for satisfactory trail experiences are not met for OHVs; are partially met for snowmobiles, interpretive, and barrier- free trails; and are fully met for hiker, horse, mountain bike, and cross-country ski trails. There is a need to fully meet all trail user daily requirements. Research suggests that OHV use and non-motorized trail use have negative effects on soils, wildlife, and vegetation unless properly located and responsibly used. There is a need to minimize effects on natural resources. Development of OHV trails was halted in 1990 due to an appeal of the Forest LRMP and subsequent appeal settlement.

The document, Interim Strategies for Managing Anadromous Fish (PACFISH), February 1995, amended the Forest and Grassland plan to include additional goals for Riparian Habitat Conservation Areas (RHCAs). Non-anadramous watersheds in the Analysis Area are being managed under Standards & Guidelines set forth in the Decision Notice for the Inland Native Fish Strategy Interim Strategies for Managing Fish-Producting Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portiona of Neveda, commonly referred to as INFISH (1995). These documents add additional layers of goals and direction to the existing Forest and Grassland Plans. Final direction for management of anadromous and inland fish will occur in the future. There is a need to adequately protect riparian habitat and water quality, regardless of which direction is applied.

There is a need for clear travel management direction that is understandable to both the public and Forest employees and permittees. Currently, the Forest Travel Map direction does not always match Forest and Grassland Standards and Guidelines. Signing on the ground does not always match either the Travel Map

or Forest Plan Standards and Guides. When the public is traveling Forest roads and trails it is not easy to distinguish when one has passed from an "open unless posted closed" area to an area with more travel restrictions.

Public demand for trail opportunities is increasing. Within the State of Oregon there are about 12,000 miles of trail. Trail use is among the highest growth recreation activities in the state, especially in and near urban areas. Conflicts among hikers, OHVers, horseback riders and mountain bikers are becoming more frequent (Oregon State Parks 1994).

Major barriers to more outdoor recreation for many Oregonians are lack of time and distance from resources and facilities. Lack of knowledge and skills, and user uncertainty about where resources are located, suggest that greater attention to educating the public should be a priority. (Oregon State Parks 1994)

Demand for OHV trail opportunities in the Central Oregon area has been increasing since 1989. The Oregon State Comprehensive Outdoor Recreation Plan (Dec 1988), projects a 4.3% increase in OHV participation in off-road vehicle driving statewide in the next ten years.

Currently the Forest and Grassland provide 220.5 miles of trail of which 8.1 miles are designated for OHV summer use, 75 miles are for winter motorized use, and 137 miles are for summer and winter nonmotorized use. The Forest and Grassland Plans call for additional construction of approximately 178 miles of OHV summer trail, 240 miles of snowmobile trail, and 260 miles of nonmotorized trail by 1999. Since 1989 the Forest and Grassland have constructed 70 miles of nonmotorized trail and 75 miles of snowmobile trail. An additional 12 miles of trail were analyzed and a decision not to build them was made. Note that some of the mileages mentioned are different than what appeared in the DEIS. The changes are due to mathematical recalculation of Appendix A in the Forest and Grassland LRMP and additional miles of trail constructed that were not counted in the DEIS. These changes in mileage were not substantive and did not change the relative structure of any of the alternatives.

The Decision to be Made

The Forest Supervisor of the Ochoco National Forest will decide where and when motorized and non-motorized use will be allowed on the Ochoco National Forest and Crooked River National Grassland. Where these uses are allowed, he will decide how much opportunity will be provided and under what circumstances. He will also decide what types of resource protection may be necessary to mitigate any potential adverse effects to natural resources from motorized and non-motorized trail use and off-designated route use.

1.4 OVERVIEW OF ISSUES AND ALTERNATIVES

Public comment during the 45 day comment period on the DEIS did not raise any new issues, however areas of the FEIS have been more fully developed for analysis and clarity. The list of issues was identified from the Forest and Grassland access and travel meetings in 1990-1991, as well as from letters and comments received during the DEIS scoping period in March 1995. Issues are defined by three key areas:

1. Social Issue
3. Administrative and Permittee (Commodity) Uses
4. Resource Considerations

Within these three key areas there are specific issues addressed in this FEIS. These include: (1) user conflicts, trail user concerns, hunting, special events, user safety, adjacent landowner impacts, and trail development and off-trail use opportunities; (2) administrative and permittee use including all types of permittee access; and (3) travel route management to protect wildlife, fish, plants, soils, threatened, endangered and sensitive species.

1.41 Issue 1- Social Issues

Discussion
Trail user conflicts

Many issues related to travel on the National Forest are social issues. Social issues deal with visitor perceptions, expectations, attitudes, beliefs, and values. Recreation activities and the places on which they occur hold special values for visitors. The benefits they derive from their recreation experience include physical well being, mental health, relaxation, family and group cohesion, enhancement of self-esteem, building of skills, and much more. People may pursue different activities yet receive the same psychological and physical outcomes. However, when the pursuit of one activity is interfered with by someone pursuing a different activity, user conflicts may occur for both parties. The Recreation Opportunity Spectrum is used by the Forest Service to provide a range of recreation setting and opportunities. Settings range from primitive nonmotorized to highly urban. By providing this range, and letting people know where the particular benefits they are looking for can most likely be found, the Forest Service tries to provide for a wide variety of expectations.

Recreation visitors often share the same recreation resources. Some user groups feel that encounters with other groups detract from their recreation experience. Other groups do not mind sharing the same trail or area with a large variety of groups. When visitor expectations are not met they become dissatisfied and conflicts may occur. Some groups have a higher tolerance for disturbances than others. For example, in most cases, OHV users do not mind encountering hikers, horse riders or mountain bikes. The reverse is not true. Motorized users are not generally tolerated by nonmotorized users on hiker or horse trails. Mountain bikes are acceptable to many horse and hike visitors but not always. Hikers and horse riders are generally tolerant of one another's presence on trails (Pugh, 1989). If nonmotorized trail users are using a trail they know will have motorized uses they are more likely to tolerant motorized presence.

Dissatisfaction from nonmotorized trail users encountering motorized users is often associated with noise from motorized vehicles. Noise can interfere with a persons sense of solitude especially in primitive and semiprimitive settings. Noise from motorized vehicles may cause other trail users such as horses and llamas to spook, endangering the riders. Unfamiliar vehicles such as mountain bikes may also cause horses to spook.

Each trail user group has expressed a desire for more miles/hours of trail opportunity. In many cases it is a desire to ride in an area of special significance to them, not necessarily because they feel crowded or dissatisfied with existing trails. Developing single and multi-use trail opportunities to satisfy a wide range of recreation trail demands will create a more satisfying experience for all visitors.

OHVs are used for recreation and hunter access. OHVs can utilize restricted roads and trails that allow motorized use, or operate off of roads and trails. Extensive trail systems with loop opportunities provide the highest quality recreation experiences. Trail systems may need to be specifically designed for each class of OHV (see Chapter 3 for a description of each OHV class) to minimize user conflicts. Unrestricted use can result in erosion and damage to natural resources and conflicts with non-motorized recreation users.

The proposed action includes many clarifying measures that do not change the Forest Plan but do address user conflicts. These include an emphasis on user education and trail etiquette, improved signing standards and information distribution, increased monitoring of trail use, trail condition, and conflicts, enforcement of state noise regulations for OHVs, and an emphasis on partnerships and volunteers to provide more trail opportunities. Prevention and mitigation of resource damage is needed. The main concern of most environmentally concerned publics is off-designated route use of OHVs in sensitive areas.

Dispersed Camping

Dispersed camps are often established in riparian areas due to aesthetics of these sites. Improper use of these sites may contribute to stream sedimentation, damage to riparian vegetation, and decreased streambank stability. Dispersed campers may also bring OHVs or horses and use them in the immediate camp area. All three uses (the camp itself, riding of OHVs in immediate area, and tethering and use of horses in the immediate camp area) may cause adverse affects to soils and vegetation. The public is concerned that travel restrictions may prevent them from camping in their favorite places and using horses or OHVs as part of their camp experience.

Special Events

There is a demand for a wide variety of trail related Special Events ranging from Horse Endurance Rides, mountain bike rides, motorcross rides, to OHV events. Events may range in size from 30-600 people. Adequate parking and support facilities may not exist on the Forest or Grassland for large events. Many events have been allowed in the past without adequate NEPA analysis and documentation. Travel restrictions may put more limitations on where and when Special Events may occur.

The proposed action includes clarification of existing Forest and National policy about Special Use events. These events can only be held after an application has been submitted to the Forest Service, an environmental analysis completed, and terms and conditions for the event agreed to. This clarification addresses this issue and is not carried forward in this analysis.

Private landowner concerns

Vandalism and trespass on private lands may result from forest visitor use. Private landowners are concerned and want the Forest Service to provide trails that do not tempt trail users to trespass onto their lands. Trails that dead end on private land boundaries or are immediately adjacent to their lands increase the chances of trespass and vandalism.

The proposed action includes clarification and expansion of existing Forest policy that private landowners must be consulted during the planning phase of any new trails. Additional signing and landowner consideration may be enough to address this issue. However, some landowners may feel that the more trails that are developed the more likelihood that some recreationists may trespass or vandalize their private property.

Indicators:

* minimum daily trail requirements and trail miles by user type
* acres open to off-designated route motorized travel
* ROS acres available in each recreation setting
* risk of non-compliance
* ease of implementation

1.42 Issue 2 - Administrative and Permittee (Commodity) Uses

Discussion

Motorized vehicles allow resource management access for a variety of activities conducted by the Forest Service, cooperating government agencies, contractors, and permittees. Nonmotorized access is also available for management activities, generally at increased cost and inconvenience compared to motorized access. The variety of activities conducted include contract administration, restoration, resource inventories, fire and fuels management, range allotment administration, and collection of special forest products (boughs, cones, posts & poles, firewood, Christmas trees, mushrooms, and mineral landscape material). Restrictions on administrative use may limit opportunities for resource management activity and commodity uses. Concern was expressed that closing the Analysis Area to motorized off-designated route use would limit a persons ability to gather forest products. Many people want to drive their vehicle as close to the product source as possible for convenience and cost savings.

The proposed action includes clarification of existing Forest policy that administrative uses of motorized vehicles on and off developed roads and trail would be allowed in motorized management areas. The proposed action also includes clarification of existing Forest policy that permittees would be allowed to use motorized vehicles on and off-designated routes to do their work as allowed under their permit. This clarification may be enough to address this concern.

Indicators:

* potential to cause inconvenience or lack of access for federal and permittee administration of contracts or work

1.43 Issue 3 - Resource Issues

The proposed action allows off-designated route travel by OHVs in General Forest Areas. People are concerned about the potential negative effects to heritage resources, fish, wildlife, plants, and soils from trail construction, trail use, and cross-country travel in this and other Management Areas.

Existing travel route management policy developed for the Analysis Area intended to allow multiple recreation uses while protecting resources including wildlife, fish, plants, soils, and TES habitat. Resource damage has continued to occur. There are many factors that have contributed to this resource damage by OHV riders including: inadequate signing on the ground about where riding is or is not allowed, inconsistencies between the Forest Plan Standards and Guidelines and the Forest Travel Map, and lack of designated trails due to a moratorium on OHV trail construction until resolution of the Forest Plan Appeal.

Travel route management is a way to protect resources. Restricting use to designated routes in sensitive areas can protect resources if there is adequate signing, maps, and visitor education. The existing policy of allowing off-designated route motorized recreation use in General Forest (MA-F22), Dispersed Recreation (MA-F14) and Bandit Springs (MA-F16) continues to concern resource specialists and the public. Lack of designated motorized routes and the "open unless closed policy" are seen as prime factors leading to existing resource damage. Specific concerns by resource area are described below.

Discussion - WILDLIFE

Motorized uses both on and off forest trails may disrupt wildlife and reduce effective wildlife habitat. Wildlife may be harassed by trail users or those traveling off designated trails. Protection of big game calving/ fawning habitat and bird nesting habitat is a concern. If closed roads are converted to OHV or other trail uses there is the possibility that the original intent of the road closure will not be met. For example, many forest roads are closed seasonally or permanently to reduce wildlife harassment or protect reproductive habitat.

The proposed action includes clarification of existing Forest policy to keep road/trail densities to those described in the Forest and Grassland LRMPs.

Discussion - FISH

New concerns about riparian areas and fish habitat have emerged since the Forest and Grassland Plan was approved in 1989. The proposed action to continue allowing off-designated route use by OHVs in General Forest may have an indirect cumulative effect on fish habitat and water quality. Concerns include protection of anadromous streams and improvement of water quality and temperatures for inland fish. Standards and Guidelines for the management of anadromous and inland fish come from PACFISH (officially adopted on the Forest and Grassland with the Decision Notice for the Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and portions of California (PACFISH),(1995) and from Inland Native Fish Strategy Interim Strategies for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada (INFISH) (1995). Other documents and decisions addressing these concerns include: the

Eastside Ecosystem Management Project, Viable Ecosystem Management Guide (Simpson et al. 1994), the Regional Foresters Eastside Forest Plan Amendment No. 1 and 2, General Water Quality Best Management Practices (USDA Forest Service, 1988), and the Columbia River Basin Wide Anadromous Fish Habitat Management Policy and Implementation Guide. The Standards and Guidelines from these documents must be considered in trail construction, reconstruction, trail designation standards, and off-designated route use.

Riparian concerns about trail construction and use, and off-designated route use by OHVs include trail encroachment on streams, water channeling and increased runoff, increased sedimentation, and loss of woody debris and shade in streams. Sedimentation, breakdown of stream banks, and leakage of toxic chemicals such as gas and oil into streams were concerns expressed by the public.

The proposed action includes attainment of Riparian Management Objectives, and limits motorized use to designated routes in riparian areas in all Management Areas.

Discussion- PLANTS and SOILS

Trails may encourage off-designated route motorized travel in areas previously little visited, thus increasing the potential to disturb sensitive plants. Off-designated route travel by motorized vehicles, horses and mountain bikes may disturb sensitive plants. Documented resource damage, which includes disturbance of vegetation on hillsides and riparian areas has been attributed to OHV and horse use in inappropriate areas or during inappropriate seasons. Loss of vegetation leads to increased soil erosion, rutting, and sedimentation.

The proposed action to build 7 days (500 miles) of OHV trail and 260 miles of additional non-motorized trail is also a concern. The amount of new construction, location of the proposed trails, and routing of sediments along trails may have effects on soils, vegetation, and water quality.

Concern was expressed about soil compaction, displacement, puddling, cutting, erosion and removal of vegetation cover due to recreation trail and off-trail use. Many people felt that OHV use caused resource damage (especially hill climbing), erosion and stream channeling. OHV users traveling cross-country during wet soil periods are causing soil compaction. Some suggested OHV use be allowed only on low/no maintenance roads, logging roads and roads closed to highway vehicles. OHV trails should be located away from critical habitats such as riparian zones, meadows, and calving areas. OHVs should not be allowed in dispersed recreation sites. Other trail users including mountain bikes and horses were also seen as a source of soil erosion and compaction.

Indicators:

* acres of lithic soils (scablands)
* acres over 30%
* acres available for off-designated route motorized travel
* acres within 400 feet of Level 1-4 roads
* acres within PACFISH/INFISH identified buffers
* acres of soil displacement from trail construction
* risk of temporary impacts from new trail construction
* protection of aquatic resources from off-designated route closures
* risk of non-compliance

1.44 Non-significant Issues

Many issues related to motorized travel on system roads were raised during the Travel Access Scoping process prior to 1994. Some of these issues were not directly related to trail travel or motorized non-designated route travel and were not carried forward. These issues included grazing, timber harvest, road closure devices, road densities, wildlife management not related to OHV issues, Wilderness designation, Roadless Area designation, Visual Quality Management, and State hunting season management and regulation. A copy of all public comments is available in the Analysis File.

Two issues related to trail travel were identified in the Notice of Intent published in the Federal Register in March 1995 that were not carried forward. These issues were (1) Travel Access Management and (2) Public Affairs and User Education. Both issues were incorporated into the three main issues carried forward in the FEIS instead of using them as separate issues. Travel Access Management is a tool to achieve desired travel patterns and was used to formulate the alternatives. It was not seen as a stand alone issue. Public Affairs and User Education was incorporated into Issue 1- Social Issues. Monitoring concerns were incorporated into the Monitoring Plan contained in the Appendix but were not used to drive alternatives. Futuring and budget concerns were seen as non-significant. The great fluctuations in the Recreation and Trail budgets within the Forest Service over the last several years make these concerns difficult to use to drive alternatives. Use of volunteers and partnerships can greatly extend the recreation and trail budgets but are unpredictable. Some of these concerns were moved into Issue 1- Social Issues.

1.5 PUBLIC SCOPING

Public scoping for this FEIS occurred most recently from August to October 1995. Fifty-two responses were received on the Draft Environmental Impact Statement and serve as the basis for revisions found in the FEIS. Previous scoping occurred in March 1995, when a scoping letter was mailed to the public and a Notice of Intent was published in the Federal Register. Six comments were received during the March 1995 comment period.

Considerable past public involvement has occurred regarding Travel Access. The Forest and Grassland held over 30 public meetings and received comments from over 40 individuals and groups during Travel Access scoping in 1991. To address public comments, an appeal resolution, and emerging issues, an interdisciplinary forest team was assembled. The interdisciplinary team studied these comments and appeals from 1990-1991. The team solicited additional public comments with publication of the original Notice of Intent in March 1991. In June 1994, increasing resource damage and public demand for off-highway vehicle opportunities on the Forest and Grassland showed the need to complete this EIS. In January 1995, a new interdisciplinary team was formed to complete the EIS.

These scoping periods helped identify potential issues. Issues to be analyzed in-depth were identified through the interdisciplinary team process. Federal regulations regarding significant issues were also consulted. These issues

helped formulate the alternatives in the EIS.

1.6 Federal Permits, licenses, and entitlements necessary

There are no federal permits, licenses, or entitlements necessary for this programmatic proposed action. Some permits may be necessary at the project level.

1.7 Document Organization

Chapter 1 explains the purpose and need for the proposed action and summarizes the issues. Chapter 2, provides detailed descriptions of the six alternatives. It also describes alternatives considered and not carried forward. A table summarizing the alternatives and consequences related to each issue is at the end of this Chapter. Chapter 3 provides detailed descriptions of the Affected Environment by resource. Chapter 4 provides in-depth discussion and analysis by issue for each Alternative. Appendices include a glossary, literature cited, Trail Locations & Design Guidelines, a Monitoring Plan, an Education and Enforcement Plan, and resource data.

CHAPTER 2
ALTERNATIVES

CHAPTER 2
ALTERNATIVES INCLUDING THE PROPOSED ACTION

This Chapter describes the alternatives developed by the Interdisciplinary Team to address the issues raised by the public and internal agency specialists concerning trail and off-designated route use on the Ochoco National Forest and Crooked River National Grassland.

There have been some changes to this Chapter between the DEIS and this FEIS. Specifically, the number of non-motorized trail miles that would be developed in Alternatives A, C, D, E, and F is 55 miles less than listed in the DEIS. Thirty-nine more miles of snowmobile trail would also be developed in these same alternatives. These changes in mileage are due to mathematical error when adding trail miles listed in Appendix A of the Forest and Grassland LRMP. Some trails that were listed as reconstruction were also counted for new construction, and some existing trails were not counted as existing. This has been corrected in the FEIS. To better document existing and proposed trails a new chart has been added. These changes in trail miles lead to a slight change in acres of soil, vegetation, and wildlife habitat disturbed by new trail construction.

2.1 ALTERNATIVES CONSIDERED

The alternatives considered represent a range of reasonable alternatives to address the issues identified in Chapter 1. This Chapter describes mitigating measures, six alternatives, alternatives considered but not carried forward, and summarizes the environmental consequences.

2.2 MITIGATING MEASURES

An alternative is a set of planned actions. Some of these actions are designed to meet the objectives of the proposed action. Other actions are designed to mitigate the effects of an action on the physical, biological, and/or social environment. These mitigating measures provide direction to future trail planners on the location, construction, and maintenance of trails and for off-designated route uses. These measures are found in three forms:

1. The Forest and Grassland Plans provide direction. Forest-wide standards and guidelines apply to all activities within each alternative unless otherwise noted. Management Area standards and guidelines would also apply if trail or off-designated route uses are proposed in that particular management area unless otherwise noted.

2. Some mitigating measures are part of the design of an alternative in response to the issues. In addition, individual trail design will mitigate many concerns. Where a proposed trail is placed on the ground, the total length of the trail, and the closure of the trail to various seasons or types of uses are all clearly specified in each trail management objective. Regional and national trail construction standards were developed to mitigate the effects of trail use on soils, water quality, erosion, vegetation disturbance, visitor safety, etc. Appendix F, Trail Location and Design Guidelines summarizes this direction.

3. Other mitigating measures were developed by the ID Team to reduce or eliminate the effects of trail construction and use on the immediate environment. These are also contained in Appendices E and F.

2.3 ACTIONS COMMON TO ALL ALTERNATIVES

Social Issues

Provide information to trail users at trailheads and other locations concerning use restrictions and appropriate user behavior. Emphasis TREAD LIGHTLY programs to educate users. Implement the Trail Education and Enforcement Plan (Appendix E).

To help people understand what types of users may be encountered on designated trails, brochures, Recreation Opportunity Guides, and trail maps will clearly state trail difficulty level and accepted trail users.

Minimum Forest Service Regional Sign standards as described in Standards for Forest Service Signs and Posters (EM-7100-15) will be implemented. All existing and planned trails will have an approved sign plan. This sign plan will be implemented on-the-ground before the trail is open to the public. This signing will allow people to know what kind of trail users are allowed on each trail and also emphasize a trail courtesy message.

Monitor trail use to determine use patterns, trends, and conflict situations.

Conduct trail maintenance and condition surveys as specified in the Trail Management Objectives. Highest priority maintenance will be given to situations that may affect water quality or TES plant or animal species.

State laws and regulations regarding allowable noise levels, muffler specifications and user safety equipment will be enforced by the Forest Service and State Highway Patrol.

All existing and planned Forest and Grassland trails will have approved Trail Management Objectives (TMOs) or be closed to all uses until TMOs are completed and approved. The TMOs will clearly state which types of trail uses are permitted, including which specific types of motorized uses will be allowed.

Partnerships and volunteer opportunities for constructing/ reconstructing/ designating/ and maintaining trails, user education and monitoring will be emphasized.

Special Events including endurance and competitive rides for both motorized and nonmotorized uses will be evaluated through the existing Special Uses permitting process. This includes completion of an environmental analysis prior to approving an event. Of primary concern is the ability to handle large events (parking and impacts of many users in one area).

When developing trails near private lands, consult with the landowner during the project planning stage. Avoid building trails directly adjacent to private lands. Post the National Forest boundary where trails are within 1/4 mile of private land. Avoid developing trails which parallel private land for long distances.

Adminstrative and Permittee (Commodity) Uses

Administrative use in areas closed to OHV off-trail/road travel will be allowed on a case-by-case basis for inventory, monitoring, restoration, and activity planning such as timber sales.

Biological Concerns

Locate no more than 10% of new motorized and non-motorized trails within riparian areas and no more that 20% of new motorized and non-motorized trails within scablands.

Minimize trail locations in riparian areas except in specific areas where topography is extreme (rock formations, etc.) or it is desired to interpret or demonstrate riparian values to trail users.

All Management Areas closed to motorized travel, or motorized travel off designated routes in the existing Forest and Grassland Plans will remain closed.

Apply Interim Direction for PACFISH, the Interim direction for INFISH, and the Regional Forester's Eastside Forest Plan Amendment Amendment No. 1. Do not prevent attainment of Riparian Management Objectives (RMOs) through trail construction or off-designated route use.

Promote trail structures, including stream crossings that minimize disturbance to Class I - IV streams and moist/wet areas, consistent with Riparian Management Objectives.

Forest and Grassland road / trail density Standards and Guidelines will remain as specified in the Ochoco National Forest LRMP and Grassland LRMP.

Alternative A: Forest Plan
This alternative would continue to manage, develop, designate, and maintain trails as described in the Ochoco LRMP, including Appendix A9 (page A-14) and the National Grassland LRMP including Appendix A3 (page A-3).

The Desired Future Condition on the Grassland states the following for OHV opportunities (p4-13):

> Off-road vehicles (ORVs) are expected to become increasingly popular. ORV use will be accommodated on designated routes on the Grassland. Staging areas, camp areas, and routes offering a variety of challenges will be identified on the Grassland.

The Desired Future Condition on the Forest states the following for OHV opportunities (p.4-25):

> Most of the Forest will continue to be open to off-road vehicle (ORV) use, but use will be directed to and encouraged on designated routes that will be developed. Some areas or routes will be closed and are designated on the travel plan map. ORV use will be managed and monitored to provide for resource protection.
>
> ATV and mountain bike routes will be available, offering a wide variety of terrain and experience levels. An extensive, marked snowmobile route system and cross-country ski trail system will also be available for winter time use.

The Forest and Grassland plans Appendix A, (USDA Forest Service 1989) show the following list of trail development planned for 1989 to 2000. The objectives for OHV trail development in the Ochoco LRMP state the following (p.4-23):

> ORV use, and trail construction and reconstruction, will be allowed where they are not in conflict with other resource management objectives. Routes will be identified on the Forest to encourage use in specific areas by offering a variety of challenges and terrain. No numerical estimates are presently available.

Table 2.1 summarizes planned trail construction/ reconstruction through the first decade of Forest Plan implementation. It also shows trail construction and reconstruction completed through 1995. Note that total miles constructed may not be as much as 898 miles because some trails serve multiple users and their mileage would be counted separate for each user group. For example the 8.1 mile Independent Mine trail would be counted for horse, hike, mt. bike, and ski use; equally 32.4 miles counted. The difference in trail mileage listed in Table 2.1 in the DEIS and the FEIS is due to mathematical error in the DEIS. Appendix A of this FEIS provides a complete list of trails shown in Appendix A of the LRMP for all existing and planned trails in the Analysis Area by type of use. While the Schedule for trail development is not set-in-stone, it does indicate the direction the Forest and Grassland desire to head with trail development.

Table 2.1 Trail miles planned and completed for Alternative A.

Trail Use Type	miles planned	miles completed	remaining
cross-country ski	186	32.2	153.8
snowmobile	314.5	75	239.5
OHV & multimotor	186	8.1	177.8
nonmotorized summer trail	397	105.2	291.8
TOTALS	897.7	220.5	677.2

Motorized off-designated route use

The Forest is open to motorized off-designated use in General Forest (MA-F22), Dispersed Recreation (MA-F14), and Bandit Springs (MA-F16) Management Areas. The Grassland is not open to off-designated route travel. Table 2.2 summarizes closure types and times by Management Area.

Table 2.2 Management Area Off-Designated Route Travel Direction.

MANAGEMENT AREA	CLOSURE TYPE	TIME OF CLOSURE
MA-F1,2,3,4,5,13 Black Canyon, Mill, and Bridge Creek Wilderness; NF Crooked River WSA, Research Nat Area; Developed Recreat. MA-G 4,5,6,7,8 (RNA, Juniper OG, Crooked River Rec, Deschutes River, Squaw Creek)	no motorized use	yearlong
MA-F6,7,8,9,10,11, 19,25,26,27 (OG, Summit Trail, Rock/Cottonwood-roadless, helicopt. Silver Crk., Look-out Mtn, Deep Creek Hwy 26 Visual Corr. Visual Corridors, Round Mt trail)	designated routes only; except snowmobiles	yearlong
MA-F15,23,24,28 (Riparian, NF Crook Rec & Scenic, Fac.) MA-G1,2,9,10,11,13 (Antelope WR, Met. Deer WR, Riparian, Rimrock Wildlife, Haystack Res, Lake Billy Chinook)	designated routes only	yearlong
MA-G3,14 (General Forage, Dispersed Rec)	allow no cross-country travel except admin. and permittee use	yearlong
MA-F16 (Bandit Springs)	snowmobiles on designated routes	Dec 1 to May 1
MA-F17 (Steins Pillar Rec)	motorized use prohibited except snowmobiles on designated routes	
MA-F12,18,20,21 (Eagle Roost,Hammer Wildlife, Winter Range, GR Wint Ran)	designated routes only; prohibited Dec 1 to May 1	
MA-F14, 22 (Disp Rec,Gen For.)	encouraged on designated routes/ areas	yearlong

Note: MA-G12, 15, and 16 do not have specific OHV off-road management direction

Alternative B: No Action
This alternative would build no new trails on the Forest or Grassland. The existing trails are listed in Table 2.3. Travel restrictions on the Forest would be the same as Alternative A summarized in Table 2.2. Travel restrictions on the Grassland would be those shown on the Forest Travel Map.

This alternative is used to show the difference between what the Forest and Grassland Plans prescribed versus on-the-ground management. The Forest and Grassland Travel Map and Addendum 1994 were used as a basis to illustrate implementation of Standards and Guidelines. There are major differences between travel restrictions shown on the Travel Map and Standards & Guidelines. Some of these changes are a result of District level EAs that have closed or opened areas to various types of motorized travel. There is also a difference between what the Forest Travel Map shows and what is actually signed on the ground.

Table 2.3 Existing Forest and Grassland Trail Summary for Alternative B.

HIKE: Easy=	8.1 miles	NORDIC SKI: Easy=	5.6 miles
More Difficult=	55.8 miles	More Difficult=	12.6 miles
Most Difficult=	71.6 miles	Most Difficult=	14
TOTAL	135.5 miles	TOTAL =	32.2 miles
HORSE: Easy=	1.8 miles	MT. BIKE: Easy=	4.9 miles
More Difficult=	50.4 miles	More Difficult=	21.7 miles
Most Difficult=	59.7 miles	Most Difficult=	40.8 miles
TOTAL	111.9 miles	TOTAL	67.4 miles
OHV: more difficult=	8.1 miles	SNOWMOBILE:	75.0 miles not rated
TOTAL	8.1 miles		

TOTAL TRAIL MILES ON OCHOCO AND GRASSLAND: 220.5 MILES

Alternative C: General Forest open with moderate OHV trail development
This alternative would allow for the development of 3.5 days of OHV riding opportunities, which translates into about 250 miles of well designed, diverse OHV trail with at least one large staging area.

A total of 314 miles of snowmobile trail would be developed (75 are existing). A total of 397 miles of non-motorized summer trail would be developed (137 are existing). See Table 2.1 and Appendix A.

The Forest and Grassland would remain open to nonmotorized off-trail/road travel.

Use of OHVs in dispersed campsites would be limited to entry and exit of the site on designated routes.

Use of motorized vehicles, including OHVs would be limited to designated routes in Bandit Springs Management Area (MA-F16).

Use of motorized vehicles, including OHVs would be limited to designated routes only on the Crooked River National Grassland.

General Forest Management Areas (MA-F22) would remain open to motorized off-designated route travel with the following exceptions:

* riparian areas
* scablands
* sensitive soils including highly erodible slopes over 30% during wet weather from Dec 1 to May 1

Alternative D: (Agency Preferred) General Forest open with max OHV trail development

This alternative would allow for the development of 7 days worth of OHV riding opportunities, which translates into about 500 miles of well designed, diverse OHV trail with at least one large staging area.

A total of 314 miles of snowmobile trail would be developed (75 are existing). A total of 397 miles of non-motorized trail would be developed (137 are existing). See Tables 2.1 and Appendix A.

The Forest and Grassland would remain open to nonmotorized off-trail/road travel.

Use of OHVs in dispersed campsites would be limited to entry and exit of the site on designated routes.

Use of motorized vehicles, including OHVs will be limited to designated routes in Bandit Springs Management Area (MA-F16).

Use of motorized vehicles, including OHVs would be limited to designated routes only on the Crooked River National Grassland.

General Forest Management Areas (MA-F22) would remain open to motorized off-designated route travel with the following exceptions:

* riparian areas
* scablands- use would be allowed on existing two-track non-system roads
* sensitive soils including highly erodible slopes over 30% during wet weather from Dec 1 to May 1

Alternative E: Motorized uses on designated routes only, max trail development

This alternative would allow for the development of 7 days worth of OHV riding opportunities, which translates into about 500 miles of well designed, diverse OHV trail with at least one large staging area.

A total of 314 miles of snowmobile trail would be developed (75 are existing). A total of 397 miles of non-motorized trail would be developed (137 are existing). See Tables 2.1 and 2.11.

Nonmotorized off-trail/road travel on the Forest and Grassland would be allowed.

All motorized use (except snowmobiles), including OHV use would be permitted on designated routes only, except for administrative use which would be allowed on a case-by-case basis with District Ranger approval. Permittee travel with motorized vehicles would be limited to designated routes only.

Motorized use (except snowmobiles), including OHV use by hunters (including deer and elk hunters), and dispersed campers, would be allowed on designated routes only throughout the Forest and Grassland.

Alternative F: Motorized uses on designated routes only, moderate trail development

This alternative would allow for the development of 4 days of OHV riding opportunities, which translates into about 250 miles of well designed, diverse OHV trail with at least one large staging area.

A total of 314 miles of snowmobile trail would be developed (75 are existing). A total of 397 miles of non-motorized trail would be developed (137 are existing). See Tables 2.1 and 2.11.

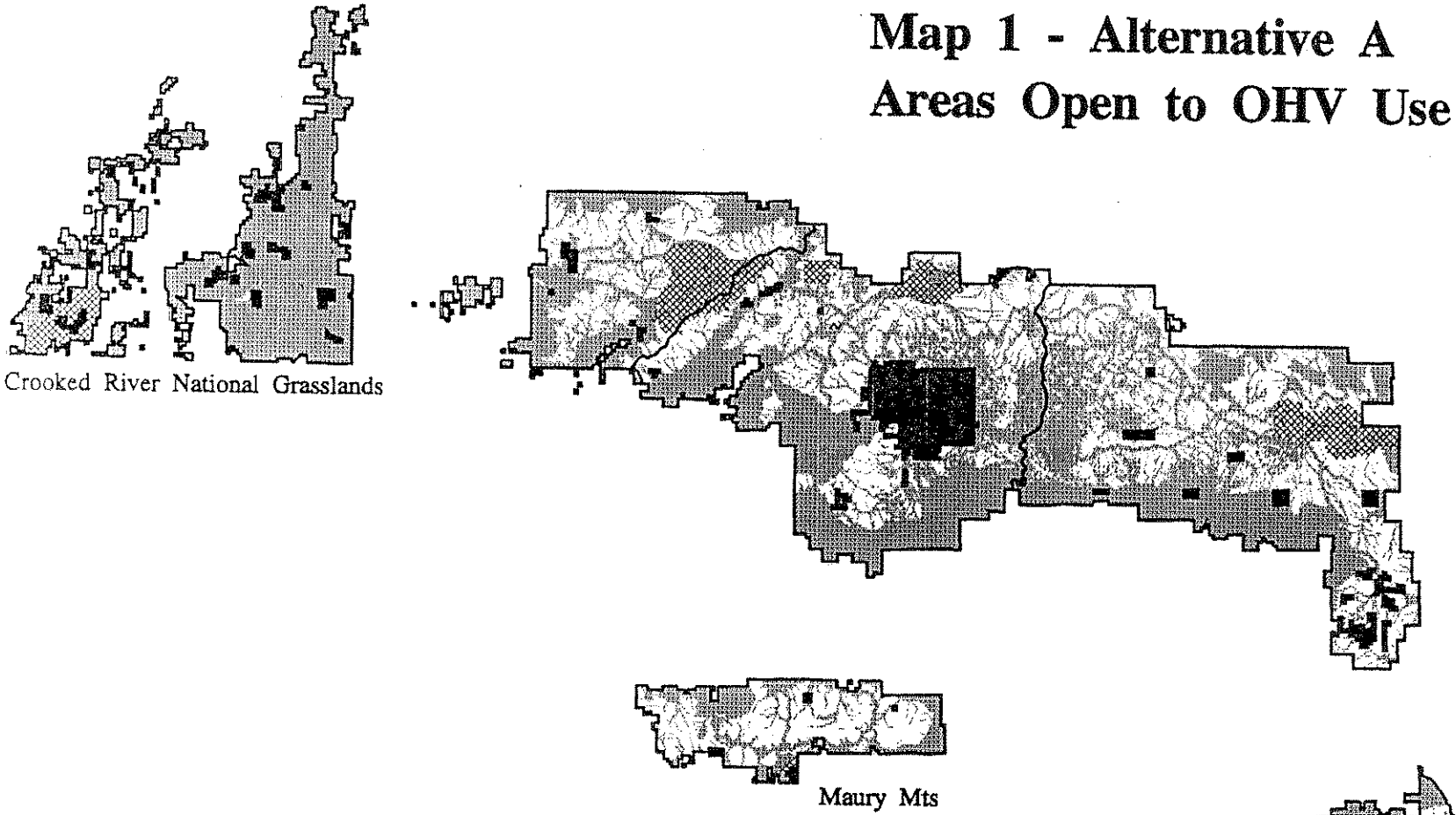
Nonmotorized off-trail/road travel on the Forest and Grassland would be allowed.

All motorized use (except snowmobiles), including OHV use would be permitted on designated routes only, with the following exceptions:

* administrative use as described in Actions Common to All Alternatives
* Commodity Users including woodcutters, and special forest product gatherers would be allowed to travel with motorized vehicles including OHVs off designated routes under the terms of their permit.
* Hunters would be allowed to retrieve dead game with OHVs during the hunting season except in areas already closed to OHV use in the Forest and Grassland LRMPs and areas closed through cooperation with other agencies

Ochoco National Forest & Crooked River National Grasslands

Map 1 - Alternative A
Areas Open to OHV Use



Pvt Lands within Forest

Open to OHV Use (Some Restrictions Apply)

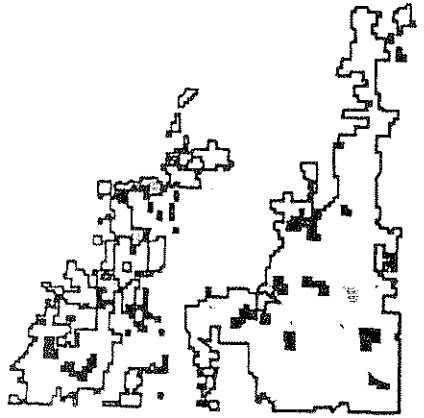
Open to OHV Use ONLY on designated routes

Closed to OHV Use at ALL times

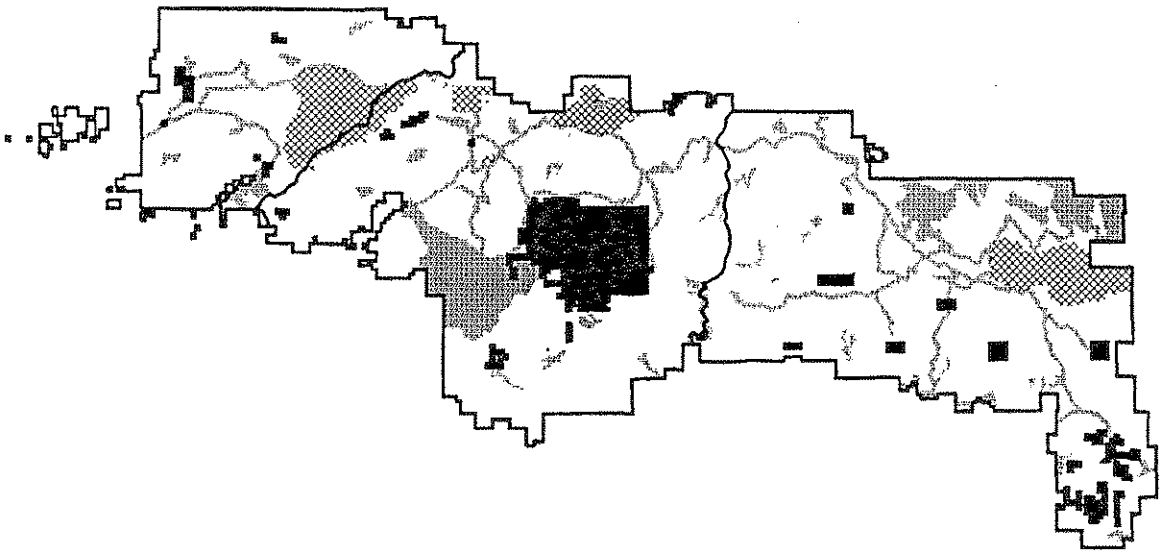
Original data was compiled from multiple source data and may not meet the U.S. National Mapping Accuracy Standard of the Office of Management and Budget. For specific data source dates and/or additional digital information contact the Forest Supervisor, Ochoco National Forest, Prineville, Oregon. This map has no warranties as to its contents or accuracy.

Ochoco National Forest & Crooked River National Grasslands

Map 2 - Alternative B
Areas Open to OHV Use

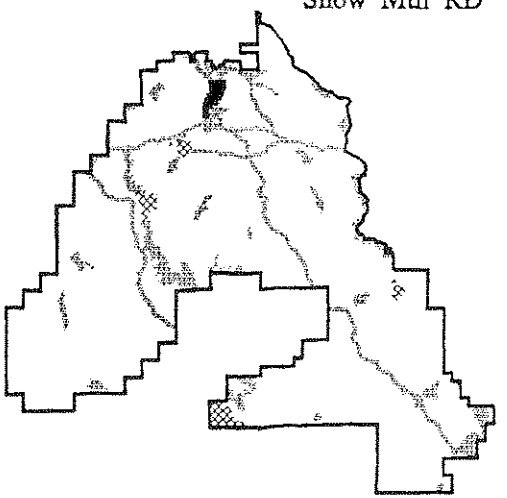


Crooked River National Grasslands



Maury Mts

Snow Mtn RD



Pvt Lands within Forest

Open to OHV Use (Some Restrictions Apply)

Open to OHV Use ONLY on designated routes

Closed to OHV Use at ALL times

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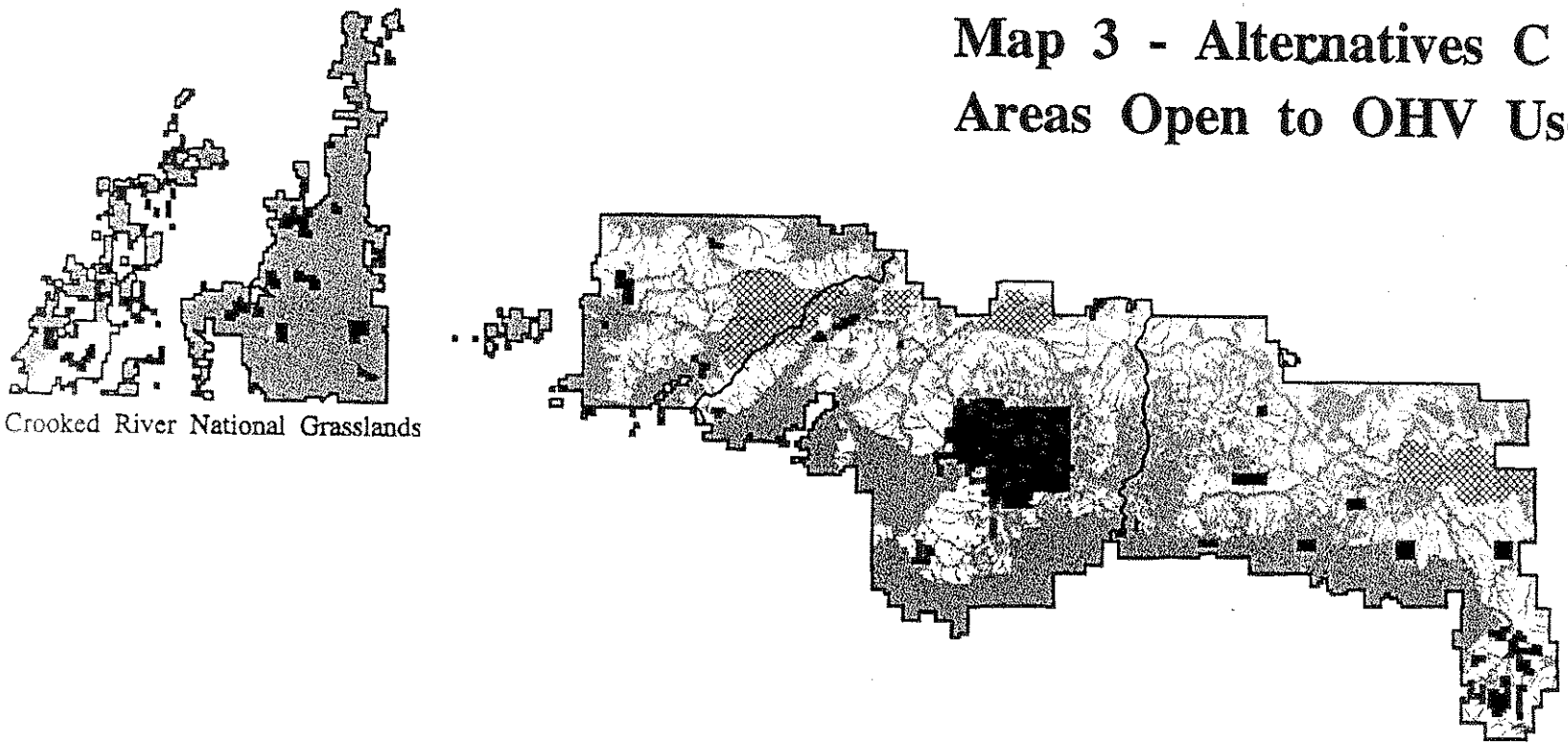
Plotdate 7/24/95

Ochoco National Forest & Crooked River National Grasslands

Map 3 - Alternatives C & D
Areas Open to OHV Use



Pvt Lands within Forest

Open to OHV Use (Some Restrictions Apply)

Open to OHV Use ONLY on designated routes

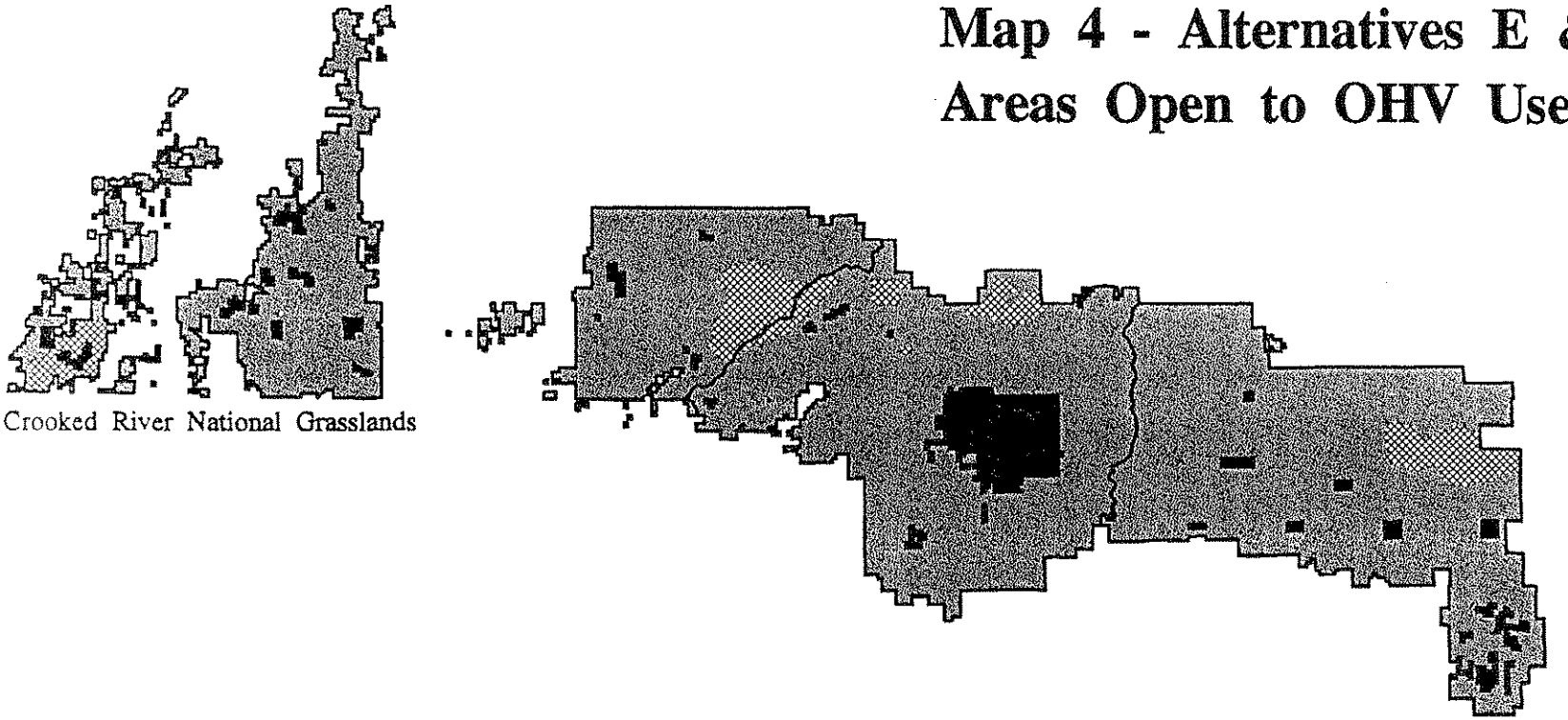
Closed to OHV Use at ALL times

Original data was compiled from multiple source data and may not meet the U.S. National Mapping Accuracy Standard of the Office of Management and Budget. For specific data source dates and/or additional digital information contact the Forest Supervisor, Ochoco National Forest, Prineville, Oregon. This map has no warranties to its contents or accuracy.

Plotdate: 7/24/95

Ochoco National Forest & Crooked River National Grasslands

Map 4 - Alternatives E & F
Areas Open to OHV Use



Pvt Lands within Forest

Open to OHV Use (Some Restrictions Apply)

Open to OHV Use ONLY on designated routes

Closed to OHV Use at ALL times

Plotdate 7/25/95

2.5 ALTERNATIVES ELIMINATED

During the Interdisciplinary Team process many suggestions, solutions, and ideas were discussed. Some of these ideas were discussed and not brought forward in the alternatives considered. The alternatives considered but not brought forward included:

Changing the Forest Plan Riparian Management Areas (MA-F15) to include all PACFISH and INFISH Riparian Habitat Conservation Areas with the interim buffer sizes. While these boundaires are part of the Forest and Grassland Plans during the interim period under the PACFISH and INFISH Record of Decisions, this FEIS is intended to provide more than interim direction. Therefore, the final boundaries as stated in PACFISH and INFISH will be used in all management decisions. INFISH would have expired by the time a site specific trail plan would be developed.

Limiting snowmobile use, especially off-designated route travel to elevations over 5,000 feet was considered. This was intended to provide more protection to Deer Winter Range and Forest tree plantations. This suggestion was not incorporated into the final alternatives due to the difficulty of implementation and the major fluctuations in snow level and depth. In years where snow is plentiful there would be no harm to tree plantations and deer would likely be at non-snow elevations. Signing the 5,000 foot level across the Forest would be almost impossible.

The ID Team considered not permitting administrative use of motorized vehicles off-designated routes in Alternative E. This was eliminated due to an on-going forest study to monitor consistency of administrative motorized access policy on each district. The study revealed that each District Ranger has authority to deal with OHV and other motorized administrative use on a case-by-case basis. Each district implements this authority differently due to individual circumstances.

The ID Team considered developing more detailed policy regarding Special Events. After much discussion it was decided that each Special Event is very different and must be handled on an individual basis. It was felt that Regional and National guidelines for NEPA analysis and permit issuance were sufficient to address internal and external concerns.

Hunting opportunities for the handicapped were discussed. It was proposed to develop an alternative to designed a barrier-free hunting areas where hunters could drive closed roads under special conditions. It was decided that this issue is too specific and outside the scope of this analysis. Provisions for barrier-free access to all trails will be considered under all trail proposals.

A range of trail miles was considered in Alternatives C-F and eliminated. A range of 250- 400 miles of OHV trail was considered for Alternatives C and F and 500-800 miles of OHV trail was considered for Alternatives D and E. The difference between the high and low ranges (150 miles and 300 miles respectively) was larger than total OHV trail miles proposed under Alternative A. The ID team considered the range too wide and settled on the number of miles that meet the minimum fully met daily trail requirements for OHVs.

One alternative was developed that would have limited non-motorized travel to designated routes only. The ID team decided there was little or no evidence of

resource damage from hikers, and only minor documented damage from horses travel off-designated route. This alternative was not carried forward.

One alternative would have eliminated all use of OHVs on the Forest and Grassland. This alternative does not meet agency policy. OHVs are a legitimate use of National Forest Lands and this policy was restated by the Chief of the Forest Service in a letter dated 12/28/94 (Thomas, 1994). This alternative was not carried forward.

The ID Team considered recommending specific areas of the Forest and Grassland for OHV trail system development. Due to time and resource considerations this alternative was not carried forward.

The ID Team considered developing trail buffers to protect scenic resources along all developed trails. This alternative was not related to identified issues and will be dealt with during the next round of Forest Planning updates.

2.6 COMPARISON OF ALTERNATIVES

Table 2.4 summarizes the actions proposed by each alternative.

2.7 SUMMARY OF ENVIRONMENTAL EFFECTS OF ALTERNATIVES

Alternatives vary in the ways they respond to the issues discussed in Chapter 1. The following discussion summarizes the consequences detailed in Chapter 4, Environmental Consequences.

Issue 1: Social Issues

Recreation Opportunities provided:

Alternative A: Off-highway vehicle trail demand is partially met. All other trail opportunities are fully met. Fifty-two percent of the analysis area is open to off-designated route motorized use. Provides a moderate amount of hunter motorized access. OHV use allowed in dispersed campsites.

Alternative B: Off-highway vehicle trail demand is not met. Trail opportunities for snowmobiles, interpretive, and barrier-free trails are partially met. All other trail opportunities are fully met. Eighty-one percent of the analysis area is open to off-designated route motorized use. Provides a large amount of hunter motorized access. OHV use allowed in dispersed campsites.

Alternative C: All trail demand is fully met. Thirty-nine percent of the analysis area is open to off-designated route motorized use. Provides a moderate amount of hunter motorized access. OHV use not allowed in dispersed campsites except for access.

Alternative D: All trail demand is fully met. Fourty-five percent of the analysis area is open to off-designated route motorized use. Provides a moderate amount of hunter motorized access. OHV use not allowed in dispersed campsites except for access.

Alternative E: All trail demand is fully met. The analysis area is closed

to off-designated route motorized use. Does not provide for hunter motorized access off-designated routes. OHV use not allowed in dispersed campsites except for access.

Alternative F: All trail demand is fully met. The analysis area is closed to off-designated route motorized use. Provides for hunter motorized access off-designated routes to retrieve game only. OHV use not allowed in dispersed campsites except for access.

Ease of Understanding and Implementing Travel direction:

Alternative A: The variety of travel closures makes this alternative difficult to sign, implement, and understand travel direction.

Alternative B: The variety of travel closures makes this alternative difficult to sign, implement, and understand travel direction.

Alternative C: Moderate difficulty in implementing and understanding travel direction.

Alternative D: Moderate difficulty in implementing and understanding travel direction.

Alternative E: Easy to implement and understand travel direction.

Alternative F: Easy to implement and understand travel direction.

Risk of non-compliance:

Alternative A: High risk of non-compliance due to difficulty of understanding travel direction, implementing on-the-ground signing, and not fully meeting OHV trail needs.

Alternative B: Highest risk of non-compliance due to difficulty of understanding travel direction, implementing on-the-ground signing, and not meeting OHV trail needs.

Alternative C: Moderate risk of non-compliance, meets basic trail needs and leaves some area open to off-designated route use.

Alternative D: Moderate risk of non-compliance, meets trail needs and leaves some of area open to off-designated route travel

Alternative E: Minimum risk of non-compliance, clear policy of closed unless otherwise signed on-the-ground, meets trail needs.

Alternative F: Least risk of non-compliance, clear policy of closed unless otherwise signed on-the-ground, meets trail needs and allows hunter access to retrieve game.

ISSUE 2 - ADMINISTRATIVE AND COMMODITY (PERMITTEE) ACCESS

Alternatives A, B, C, D, and F: Administrative and permittee off-designated route motorized access allowed under terms of permit.

Alternative E: Administrative access allowed. Permittee motorized access restricted to designated routes only.

ISSUE 3- BIOLOGICAL ISSUES

Soil displacement from OHV use:

Alternative A: Soil would be displaced on 231 acres through trail construction. Potential for soil disturbance on 498,826 acres from off-designated route motorized use.

Alternative B: Soil would remain displaced on 39 acres from existing trails. Potential for soil disturbance on 775,620 acres from off-designated route motorized use.

Alternative C: Soil would be displaced on 278 acres from trail construction. Potential for soil disturbance on 379,075 acres from off-designated route motorized use.

Alternative D: Soil would be displaced on 460 acres from trail construction. Potential for soil disturbance on 432,201 acres from off-designated route motorized use.

Alternative E: Soil would be displaced on 460 acres from trail construction. No effects from off-designated route motorized use.

Alternative F: Soil would be displaced on 278 acres from trail construction. No effects from off-designated route motorized use.

Protection of watershed/fish/riparian areas:

Alternative A: Moderate risk of impacts from trails; moderate risk of non-compliance causing watershed/ riparian damage; fair protection of aquatic resources.

Alternative B: Low risk of impacts from trails; high risk of non-compliance causing watershed/riparian damage; poor protection of aquatic resources.

Alternative C: Moderate risk of impacts from trails; low to moderate risk of non-compliance causing watershed/riparian damage; good protection of aquatic resources.

Alternative D: High risk of impacts from trails; low to moderate risk of

non-compliance causing watershed/ riparian damage; fair protection of aquatic resources.

Alternative E: High risk of impacts from trails; low to very low risk of non-compliance causing watershed/riparian damage; good protection of aquatic resources.

Alternative F: Moderate risk of impacts from trails; low to very low risk of non-compliance causing watershed/ riparian damage; very good protection of aquatic resources.

Wildlife habitat disturbed:

Alternative A: Would remove 231 acres of vegetation that may serve as wildlife habitat; trail construction would influence 40,146 acres (4% of area) of wildlife habitat; off-designated route motorized use would increase wildlife-human contact on 52% of the analysis area. Second highest risk of overall disturbance to wildlife from trail construction and off-designated route use.

Alternative B: Would remove 39 acres of vegetation that may serve as wildlife habitat; trail construction would influence 24,146 acres (3% of area) of wildlife habitat; off-designated route motorized use would increase wildlife-human contact on 81% of the analysis area. Most risk of disturbance to wildlife and habitat.

Alternative C: Would remove 278 acres of vegetation that may serve as wildlife habitat; trail construction would influence 45,946 acres (5%) of wildlife habitat; off-designated route motorized use would increase wildlife-human contact on 39% of the analysis area. Overall moderate risk to wildlife.

Alternative D: Would remove 460 acres of vegetation that may serve as wildlife habitat; trail construction would influence 70,206 acres (7%) of wildlife habitat; off-designated route motorized use would increase wildlife-human contact on 45% of the analysis area. Overall moderate risk to wildlife.

Alternative E: Would remove 460 acres of vegetation that may serve as wildlife habitat; trail construction would influence 45,946 acres (5%) of wildlife habitat; off-designated route motorized use would not occur providing habitat security away from trail influence zone, except for chance encounters with those not complying with closures. Overall second lowest risk to wildlife.

Alternative F: Would remove 278 acres of vegetation that may serve as

wildlife habitat; trail construction would influence 70,206 acres (7%) of wildlife habitat; off-designated route motorized use would not occur except for hunters, permittess, and administrative use, and chance encounters with those not complying with closures. Least risk of disturbance to wildlife and habitat.

Disturbance to vegetative resource and sensitive plants:

Alternative A: Vegetation on 231 acres removed for trail construction. Potential to disturb vegetation on 498,826 acres from off-designated route motorized use. Fifty-seven percent of riparian area, 34% of scablands, and 58% of forestlands could be effected cumulatively from roads, trails, and off-designated route use. Overall risk to vegetative resource and sensitive plants is high.

Alternative B: Vegetation on 39 acres removed for trail construction. Potential to disturb vegetation on 775,620 acres from off-designated route motorized use. Eighty-eight percent of riparian areas, 70% of scablands, and 85% of forestlands could be effected cumulatively from roads, trails, and off-designated route use. Overall risk to vegetative resource and sensitive plants is very high.

Alternative C: Vegetation on 278 acres removed for trail construction. Potential to disturb vegetation on 379,075 acres from off-designated route motorized use. Five percent of riparian areas, 3% of scablands, and 58% of forestlands could be effected cumulatively from roads, trails, and off-designated route motorized use. Overall risk to vegetative resource and sensitive plants is moderate.

Alternative D: Vegetation on 460 acres removed for trail construction. Potential to disturb vegetation on 432,401 acres from off-designated route motorized use. Five percent of riparian areas, 34% of scablands, and 58% of forestlands could be effected cumulatively from roads, trails, and off-designated route motorized use. Overall risk to vegetative resource and sensitive plants is moderate.

Alternative E: Vegetation on 460 acres removed for trail construction. Potential to disturb vegetation exists from non-compliance only, no off-designated route motorized use permitted. Five percent of riparian areas, 3% of scablands, and 1% of forestlands could be effected cumulatively from roads and trails. Overall risk to vegetative resource and sensitive plants is fairly low.

Alternative F: Vegetation on 278 acres removed for trail construction.

Potential to disturb vegetation exists from non-compliance and hunter use only, no other off-designated route motorized use permitted (except permittee and admin). Five percent of riparian areas, 3% of scablands, and 1% of forestland could be effected cumulatively from roads and trails. Overall risk to vegetative resource and sensitive plants if low.

2.8 AGENCY PREFERRED ALTERNATIVE

Alternative D is the agency preferred alternative for the FEIS.

TABLE 2.4: Alternative Summary

ISSUE - 1 (SOCIAL)	ALT A	ALT B	ALT C	ALT D - Preferred	ALT E	ALT F
Trail Use Conflicts	LRMP Trail Schedule Non-motorized = 397 miles Motorized winter = 314 miles Motorized summer = 186 miles Total = 897 miles	No New Trails Non-motorized = 137 miles Motorized winter = 75 miles Motorized summer = 8 miles Total = 220 miles	New Trail Schedule Non-motorized = 397 miles Motorized winter = 314 miles Motorized summer = 250 miles Total = 961 miles	New Trail Schedule Non-motorized = 397 miles Motorized winter = 314 miles Motorized summer = 500 miles Total =1,211 miles	Same as D	Same as C
	Closed to all motorized use. MA F1, 2, 3, 4, 5, 13. MA G4, 5, 6, 7, 8. Motorized use on designated routes only except snowmobiles. MA F6, 7, 8, 9, 10, 11, 17, 19, 25, 26, 27. Motorized use designated routes only. MA F12, 15, 18, 20, 21, 23, 24, 28. MA G1, 2, 9, 10, 11, 13. Open to off-designated route motorized use. MA F14, 16, 22.	Closed to all motorized use: MA F1, 2, 3, 4, 5, 13. MA G4, 5, 6, 7, 8. All other off-designated route use allowed as per Forest Travel Map.	MA F22 (General Forest) open to off-designated route travel with restrictions: · PacFish/Inland Fish Buffers · Scablands · Sensitive Soils No motorized use MA F1, 2, 3, 4, 13; MA G4, 5, 6, 7, 8. All other areas designated routes only.	Same as C - Except off-designated route use allowed on scab lands on existing 2-tracks.	All Management Areas motorized use, except snowmobiles, restricted to designated routes only, including: hunters.	All Management Areas motorized use, except snowmobiles, restricted to designated routes only except: · hunter allowed to retrieve dead game in motorized areas.
Dispersed Camping	OHV Off-designated route use allowed except in riparian (MA F15)	Same as A	OHV use limited to entry and exit of campsite.	Same as C	Same as C	Same as C
Administrative/ Commodity Use	Permittee (Commodity) use of motorized vehicles off-designated routes allowed in motorized areas with valid permit.	Same as A	Same as A	Same as A	Permittee (Commodity) motorized use limited to designated routes in all Management Areas.	Same as A

TABLE 2.4: Alternative Summary (cont'd)

ISSUES - 1 (SOCIAL)	ACTIONS COMMON TO ALL
Trail Use Conflicts	* Provide trail information at Trailheads about restrictions, trail etiquette, tread lightly philosophy, users who may be encountered on trail. * Inform public about expected trail experience before they get to Trailhead. * Monitor trail use, conduct trail condition surveys as stated in TMO's. * Enforce State Laws regarding OHV muffler decibals and safety equipment. * Implement FS sign standards on all designated Trails & Trailheads. * All trails will have approved TMO's or be closed. * Emphasize partnerships & volunteers for trail construction/maintenance/reconstruction.
Special Events	* Use existing Special Use Permit process. Emphasize diversity of events.
Private Landowner Concerns	* Consult with landowners adjacent to planned trails during project planning & analysis. * Sign public land within 1/4 mile of private land, avoid trails that parallel private land.
ISSUE 2 (ADMINISTRATIVE, PERMITTEE (COMMODITY) CONCERNS)	* Do not prevent permittees from economically and effectively doing their work with OHV in areas not closed to OHV use. * Administrative use of motorized vehicles off-designated routes permitted on case-by-case basis.
ISSUE 3 (BIOLOGICAL)	* All Management Areas closed to motorized use including off-designated route use in the RMP will remain closed.
RIPARIAN & FISH	* Locate no more than 10% of new trails in riparian areas and no more than 20% of new trails in scablands. * All management areas closed to motorized travel, or off-designated route motorized travel in existing Forest & Grassland Plan will remain closed. * Apply interim PacFish direction, do not prevent attainment of Riparian Management Objectives. * Promote trail structures, including stream crossings that minimize disturbance to Class I - IV streams. * Road/trail densities will remain as specified in existing Forest & Grassland Plan.
WILDLIFE	* Road/trail density will remain as specified in LRMP.

CHAPTER 3
AFFECTED ENVIRONMENT

CHAPTER 3
THE AFFECTED ENVIRONMENT

INTRODUCTION

This chapter discusses the social, physical, and biological resources on the Ochoco National Forest and Crooked River National Grassland. The discussion is limited to those subjects that the ID Team determined to be related to the proposed action and significant issues. In-depth discussion of all Forest and Grassland resources is contained in the Ochoco National Forest and Crooked River National Grassland Land and Resource Management Plans. There were some changes in this Chapter between the DEIS and FEIS. These changes include differences in existing trail miles (11.5 more miles), and some rewriting of the fisheries and wildlife sections to include additional research.

The information in this chapter is used as a base-line for the comparison of various alternatives and in Chapter 4 as a means to measure expected changes in the environment.

3.1 SOCIAL ENVIRONMENT

3.11 Public Access People visit the Analysis Area for work and play. They visit to gather forest products including mushrooms, boughs, cones, and firewood. Permittees access the Analysis Area to manage and graze their livestock, to harvest timber, to mine, and harvest many other renewable resources. The Analysis Area provides many recreation opportunities and over 350,000 visits occurred in 1994. Recreation opportunities include camping, hiking, hunting, fishing, exploring, nature study, bird and flower watching, and historical appreciation. Access by all visitors, whether recreation or commodity oriented is achieved by both motorized and nonmotorized means.

3.11a Motorized Public Access Public Access to the Analysis Area is provided through roads and trails. The Analysis Area has County, State, Federal, Bureau of Land Management, and Forest Service roads. Of these, the Forest has jurisdiction over Forest Service roads. Roads are categorized into 5 levels. Obliterated roads are no longer counted in the system. There are 831 miles of obliterated roads. A Level 1 road (ML-1) is a closed road. A Level 2 road is a low-clearance, low-maintenace 2 track. Level 3-5 roads are suitable for passenger car traffic, Level 5 being a paved 2-lane road. There are approximately 4,322 miles of Level 1 -5 roads on the Forest and 336 miles of Level 1-5 road on the Grassland for a Grand Total of 4,658 miles of open road. Of this 699 miles are suitable for passenger car/ low clearance vehicles managed as Maintenance Level 3-5 (ML 3-5); 2,975 miles are suitable for high clearance vehicles (ML-2), and 984 miles are closed roads (ML-1).

There is a downward trend in the miles of road available for administrative and recreation passenger-car. Roads open and maintained for high clearance vehicles have increased. The total miles for high clearance vehicles is now above the Forest Plan projection. Road closures and changes in road maintenance standards have been accomplished through the planning process, road management and on-the-ground implementation. Some reduction has resulted from reduced road maintenance budgets which forced the Forest to downgrade some ML-3 road to lower standards (Ochoco NF 1994).

The Ochoco National Forest and Crooked River National Grasslands Draft Travel Management Field Guide (USDA Forest Service 1993) defines a road as an area where continuous wheel-tracks on-the-ground exist for more than one season. For more specifics on the definitions of continuous and system roads see USDA Forest Service 1993. Pacific Northwest Region Handbook 7709.56 is used for travel management direction.

Motorized recreation access occurs with both highway and off-highway vehicles. Highway vehicles are defined as passenger cars, trucks, and motorcycles designed for highway driving and usually have a low ground clearance. Off-highway vehicles (OHVs) are divided into three classes as follows:

Class I- All-Terrain Vehicles (ATVs) are defined as three or four-wheeled, motorized off-highway vehicles.
Class II-Full width (4WD) vehicles are jeeps, pick-ups, dune buggies, or other motorized off-highway vehicles.
Class III-Motorcycles are defined as two-wheeled motorized off-highway vehicles

The Ochoco National Forest and Crooked River National Grassland Land and Resource Management Plans (LRMP) establish guidelines for OHV use. These guidelines are implemented via the Ochoco National Forest and Crooked River National Grassland Travel Plan Map effective September 1, 1992. The LRMP states that the Crooked River National Grassland is closed to OHV use except on designated trails. This is inconsistent with the Travel Plan Map which indicates that there are areas seasonally open. Many areas indicated closed except to designated trails in the Ochoco National Forest LRMP are also shown as open seasonally or year round on the Travel Plan Map.

Hunting, dispersed camping, and woodcutting are the three main activities on the Forest that result in continuous wheel tracks, equal or greater than 50 inches wide, that persist for more than one year and are either not shown on the Ochoco system road atlas or are shown as closed. Hunters appear to be responsible for most of the entries behind closed roads. These tracks usually receive further use until some additional closure work is done. In most cases woodcutters going off established roads do not result in nonsystem roads being established since they tend to stay within 400 feet of existing roads.

There has been an increase in the number of recreationists using the ONF for snowmobiling. There are currently 75 miles of existing snowmobile trails. Snowmobilers are not limited to riding only on the trails so during the winter months the snow level usually determines the extent and distribution of snowmobile use. Snowmobiles are not part of the OHV classification listed above. Travel direction mentions snowmobiling separately when rules apply, and Trail Management Objectives also address their use separately. Snowmobile use has been noted in the Wildernesses and other Management Areas closed to all motorized uses. Disturbance during the winter months could be critical for individual wildlife.

Motorized public access to some of the Analysis Area is regulated with seasonal closures to protect wildlife, soils, and/or the recreation experience. A summary of the times and types of closures for roads is provided in the Ochoco National Forest and Crooked River National Grassland Travel Management Field Guide (USDA Forest Service 1993) and the Forest Travel Map. Where seasonal restrictions or permanent road closures are implemented, the Forest strives to

sign the area well, and include the area on the Forest Travel Map. Monitoring was done in 1993 and 1994 to evaluate the effectiveness of implemented road closure devices on Forest Road 33 (Prineville Ranger District 1993-94). There have been mixed results. There is a high amount of vandalism to Forest Service signs. In some areas the physical closures have resulted in further adverse impacts to the land as standard vehicles and OHVs have simply found new ways to access closed roads and areas. It is estimated that 80% of the closures have been effective.

The Forest and Grassland is not encouraging OHV use on roads where all standard vehicle use has been eliminated, or on roads which have no current or planned future use, unless the use is in keeping with other resource objectives. OHV use is accepted on area's that do not prohibit their use.

Use of OHVs on Level 2 roads was legalized by the Oregon State Legislature in 1995. Oregon House Bill 2759, Section 8, ORS 821.020 passed on May 23, 1995 states that Class I, Class II, and Class III all-terrain vehicles may operate on any highway in the state that is open to the public and is not maintained for passenger car traffic. This change allows non-street legal OHVs the opportunity to operate on Forest maintenance Level 2 (high-clearance) roads. There are approximately 2,975 miles of Level 2 road in the Analysis Area. Level 1 (closed roads) that currently prohibit motorized use, would remain closed to motorized use.

3.11b NonMotorized Public Access Some of the Analysis Area is managed for nonmotorized travel only including foot, horse, and mountain bike travel both on and off developed trails. There are 220.5 miles of trail in the Analysis Area (see Physical Environment for breakdown). Nonmotorized travel is permitted on all road maintenance classes but roads are not usually designed to enhance the nonmotorized travel experience. Nonmotorized travel off of developed roads and trails is common throughout the Analysis Area. The open Ponderosa Pine stands, grasslands, scablands, and subalpine environments provide easy access for all types of nonmotorized cross-country travel.

3.12 Recreation

3.12a Recreation Opportunity Spectrum The Recreation Opportunity Spectrum (ROS) is a means of describing the physical, social, and managerial setting for land areas. By describing the type of setting the public can select the ROS areas that may best meet their preferred type of recreation experience. For example, if a person wishes to have a pristine, nonmotorized, primitive experience they would visit an area managed for the Primitive or SemiPrimitive Nonmotorized ROS. The spectrum ranges from Primitive Wilderness setting which are pristine, remote, and challenging to Urban setting with many developed facilitites, lots of people, and little challenge. This setting can change from summer to winter. Areas that may be motorized and crowded during the summer can be remote, challenging and primitive in the winter. The analysis area was categorized into six ROS classes during the Forest Planning process in 1989. Tables 3.1 and 3.2 summarize the existing ROS categories within the Analysis Area.

Existing trail distribution by ROS shows that most summer trails are located in areas managed as Roaded Natural. There are non-motorized trails available for

summer use in all ROS classes. In winter the distribution of existing trails changes. Many trails are not accessible in the winter. Existing ski trails are located in areas managed as Roaded Natural with 8 miles available in SemiPrimitive Motorized. Snowmobile trails are located primarily in winter SemiPrimitive Motorized areas.

Table 3.1 EXISTING SUMMER RECREATION OPPORTUNITY CLASSES

ROS CLASS	CODE	TOTAL ACRES	TOTAL AREA (%)	TRAIL MILES
WILDERNESS				
PRIMITIVE NOT TRAILED		3,400	.3	
PRIMITIVE TRAILED		23,600	2.5	34.7
SEMIPRIMITIVE NONMOTORIZED	SPNM	81,076	8.5	36
SEMIPRIMITIVE MOTORIZED	SPM	1,750	.2	12
ROADED NATURAL/ MODIFIED/ RURAL	RN	846,449	88.5	51.3
		956,275	100.0	134.0

Table 3.2 EXISTING WINTER RECREATION OPPORTUNITY CLASSES

ROS CLASS	CODE	TOTAL ACRES	TOTAL AREA (%)	TRAIL MILES
WILDERNESS				
PRIMITIVE NOT TRAILED		3,400	.3	
PRIMITIVE TRAILED		23,600	2.5	0
SEMIPRIMITIVE NONMOTORIZED	SPNM	68,086	7.1	0
SEMIPRIMITIVE MOTORIZED	SPM	55,415	5.8	83
ROADED NATURAL/ MODIFIED/ RURAL	RN	805,774	84.3	25.0
		956,275	100.0	108.

3.12b Recreation Trail Demand Recreation activities and the places on which they occur hold special social values for people. The benefits they derive from their trail experience include physical well being, mental health, family and group cohesion, enhancement of self-esteem, building of skills, and a spiritual connection with nature. People may use different modes of transportation on and off the trails yet receive the same psychological outcomes. There are also differences in some desired psychological outcomes between user types. Nonmotorized users are generally in "pursuit of an

introspective experience in a natural environment" and seek solitude (Pugh 1989). Motorized users are looking for a trail system that provides the opportunity for extended challenging rides, and access to specific locations such as lakes, vistapoints, or rivers (Dolphay, 1989).

People seeking nonmotorized, more primitive settings may become dissatisfied with their trail experience if they encounter motorized uses or a modified forest environment. Although no statistical surveys have been conducted to determine demand in the Analysis Area for each Recreation Setting for each type of trail user, field observations and public comments show increasing demand for several types of trail opportunities including semiprimitive ski, snowmobile, and summer OHV trails.

Monitoring of OHV use at Henderson Flat on the Crooked River National Grassland has occured since 1992. Recreation use of OHVs in this area has increased 29.1% from 1992 to 1996. This area has no designated trails due to an appeal of the Forest Plan.

The State of Oregon contains about 12,000 miles of recreation trail on federal and state public lands. Trail use is among the highest growth recreation activities in the state, especially in and near urban areas. Over one-third (34%) of all snow activities in Oregon occur in Central Oregon. Central Oregon also has 15% of all off-road driving and 14% of the camping that occurs within the State (Oregon State Parks 1988 p51). In the 1987 State Comprehensive Plan survey it was found that Central Oregon had a higher supply of opportunities than use. For example, 45% of all designated OHV trail miles in the state are within Region 10 (Central Oregon), but only 15% of the use. The Reviewers noted however that a region may have a high percentage of the state supply of a given facility, but in actuality may have insufficient supply to satisfy the overall use. Conflicts among hikers, OHVers, horseback riders and mountain bikers are becoming more frequent (Oregon State Parks, Dec 1994).

According to a 1993 Oregon State Survey (Oregon State Parks, Oct 1994), 7.5% of all Oregon households own ATVs, snowmobiles, and/or dune buggies. Motorcycles are owned by 13.6% of all Oregon households, and 4-wheel drive vehicles are owned by 38.1% of all Oregon households. The 1994 Oregon Outdoor Recreation Plan (Straton 1995) reveals that although 13% of all Oregon households participate in OHV driving, 14% of households that do not presently participate in OHV driving would like to.

The largest single concern of Oregon OHV riders, is the apprehension that their riding opportunities are in jeopardy (Draggo and Assoc. 1995). Forty-one percent of those who responded to the survey indicated their dismay with on-going pressures to close existing riding areas. One effect of reducing available OHV opportunities is that it forces an increasing number of riders into a shrinking riding area. This can lead to decreased user satisfaction, more conflicts, a greater need for education and enforcement programs, and increased environmental impacts. Another source of friction between OHV riders is the problem created when one type of OHV user impacts riding areas used by other types of OHVs. An example is when ATVs or 4-wheel drives use snowmobile areas. Another impact occurs when ATVs widen trails used by motorcyclists, thus removing some of the riding challenge.

A 1987 Oregon State Parks survey (Oregon State Parks 1991) shows that horseback

riding and snowmobiling are low growth activities, predicted to grow at less than 2.5% per year. Trail related moderate growth activities include: ATV use (4.3%), motorcycle use off-road (4.8%), 4-wheel drive off-road (4%), ATV use in snow (3.9%). High growth activities include day hiking (11.9%) and bicycling on roads (12%). It should be noted these are state-wide averages, and specific SCORP Regions, such as Central Oregon may experience a different growth rate. No specific regional data was available for OHV demand in Region 10. Central Oregon (R10) includes Crook, Wheeler, Jefferson, Wasco, Hood River, Sherman, Gilliam, and Deschutes Counties. Only the first three counties are within the Analysis Area.

3.12c Nonmotorized Trails The Central Oregon area has many miles of trail available for nonmotorized uses, including an extensive trail system on nearby Deschutes National Forest, Oregon State Parks, and Bureau of Land Management lands. In the Analysis Area trail use has remained steady for hiking, and horseback riding, with an increasing demand for special events such as Horse Endurance rides. Trail use is increasing 5-10% per year for mountain biking and snowmobiling. Trails near the population centers of Prineville, Redmond, and Madras generally receive more use than outlying trails, regardless of the type of trail. Popular nonmotorized trails near Prineville include Steins Pillar, Wildcat, Gray Butte, Lookout Mountain, and Independent Mine. Wildcat trail is heavily used while most other trails near these towns receive light to moderate use. Horse trails near Prineville and Paulina are very popular though use does not exceed capacity. The miles of trail planned in the Forest and Grassland LRMPs appear sufficient to meet demand for the next 10 years for nonmotorized uses, except for SemiPrimitive Nonmotorized ski opportunites, which currently do not exist.

3.12d Motorized Trails Summer motorized trails are not as plentiful as nonmotorized trails in Central Oregon. However, several trail systems are either in the planning stages or nearing completion that are within 1-2 hours from Prineville. The Bureau of Land Management is developing Millican Valley for OHV opportunities. Approximately 270 miles of motorcycle and All-Terrain Vehicle trail and 60 miles of 4x4 jeep trail may be developed. The Deschutes National Forest, Bend/Fort Rock Ranger District is developing about 320 miles of trail for motorcycles and ATVs. No 4x4 trails are planned.

Demand for OHV trails in the Analysis Area has increased and use on the only designated OHV trail (Green Mountain) has increased 5-10% each year for the last 5 years. More OHV trail opportunities are needed near Prineville, Madras, and Burns to provide high quality OHV experiences and to reduce the amount of off-trail riding that occurs.

3.2 PHYSICAL ENVIRONMENT

3.21 Heritage Resources

The heritage sites on the Ochoco National Forest are prehistoric , reflecting the activities of the American Indians who occupied the area, and historic, resulting from the activities of later Anglo settlers. The majority of prehistoric sites are open lithic scatters, rock shelters, and processing sites and quarries. The historic sites can be grouped into several categories. These include settlement (structures, machinery, cemeteries etc.), mining (camps, shafts), range industry (corrals, camps, troughs), logging (camps, mills), federal government (CCC, military camps, guard and ranger stations, lookouts), transportation (roads, trails, airstrips), communication (telephone/telegraph lines, signs, markers), water development (springs, ditches, dams etc), rock features (walls, circle, cairns), and tree features (lookouts, carved or blazed tree). A general estimate of heritage sites on the Ochoco National Forest and Grassland by Ranger District is as follows:

Table 3.3 Summary of Heritage Sites within the Analysis Area.

	Historic	Prehistoric
Big Summit Ranger District	200	300
Paulina Ranger District	450	350
Prineville Ranger District	250	220
Snow Mountain Ranger District	650	850
Crooked River National Grassland	350	170
TOTAL	1900	1890

The last full scale analysis of heritage resources in the Analysis Area occurred in the late 1970's-early 1980's. This analysis revealed the following about the location of sites around the forest:

* 77% were located at elevations less than 5000 feet
* 75% were associated with scabs and non-forested areas
* 75% were associated with creeks and water sources
* 50% were on flat ground

Sites were most commonly located on ridges, adjacent meadows and scabs, gentle hillslopes (especially terraces), and in and along dry stream beds and upland flats.

The Forest Cultural Resource Inventory Design identifies the following areas as high probability zones for site location:

* streams including ephemeral or fossil stream sources, confluences, benches, terraces, and other water sources
* slopes less than 20%
* ecotones, especially forest/ meadow or scab areas
* primary and secondary ridge systems
* areas of culturally significant plants

3.22 Recreation

3.22a OHV Use Impacts OHV use off of developed trails has been increasing. Although no statistical survey information is available, field observations indicate a 5-10% increase in OHV use per year for the last 5 years in the Analysis Area and a 29.1% increase at Henderson Flat specifically. Signs of OHV use observed include visible tread, disturbed vegetation, and in some cases visible resource damage. Resource damage includes exposed soils, damaged vegetation in riparian areas and meadows, and removal of road blocks. There are approximately 170 acres of historically reoccurring impacted lands in the Analysis Area due to OHVs traveling off developed roads and trails. There is also undocumented impact from woodcutters, hunters, and others using OHVs for short distances through meadows and wet areas. The 170 acres of documented OHV impact is considered a low estimates and some areas may not be included. Areas of known historic impact as of February 1995 are summarized as follows:

BIG SUMMIT DISTRICT

14 areas used by OHV's, approximately 50 acres are impacted. The hill climbs have the greatest area impacted. About 2 acres at the Sled hill, 4 acres at Horse Heaven Creek and 2 acres by Spears meadow off of Highway 26. There is also increasing OHV use at Hay Creek and Bandit Springs.

SNOW MOUNTAIN DISTRICT

5 areas used by OHV's, approximately 10 acres are impacted. Most common impact is to riparian vegetation along with rutting.

PRINEVILLE DISTRICT

28 areas used by OHV's, approximately 30 acres are impacted. Rutting with soil displacement in most areas. Some areas have soil compaction. Impacted areas include Dry Creek, A-Y Springs, Mill Creek and Klootchman Creek.

PAULINA DISTRICT

8 areas used by OHV's, approximately 30 acres are impacted.

CROOKED RIVER NATIONAL GRASSLAND

12 areas used by OHV's, approximately 50 acres are impacted. Loss of vegetative cover, soil displacement, rutting and soil compaction. These impacts have multiplied in the past six years. The Henderson Flat riding area is 1,400 acres with approximately 30 miles of undesignated trail, equaling approximately 25 impacted acres.

3.22b Visitor Management Strategies When it is necessary to close roads or trails to motorized uses for other management objectives (such as wildlife) the Forest and Grassland use a variety of closure techniques. These techniques include signing, gates, berms, disguising of road/trail entrances, visitor education through maps and brochures, and law enforcement. Closing an AREA is much more difficult than closing a specific ROAD/TRAIL. The strengths, weaknesses, and proper implementation of each type of closure is explained in detail in the Ochoco National Forest and Crooked River National Grassland Travel Management Field Guide (USDA Forest Service 1993). All types of closure techniques are present within the Analysis Area.

3.22c Facility and Site Management Most trails in the Analysis Area are maintained paths with trailhead signing and a designated trailhead. Parking spaces at trailheads are designed to accommodate the desired type of use for each trail. For example, trails designed for pack and saddle use include wide turn-arounds for trucks with horse trailers, while trails designed for hikers only are smaller to accomodate single axle vehicles. There is one OHV trailhead facility in the Analysis Area, located at Henderson Flat. The trailhead was designed to accommodate 20-30 trucks with trailers pulling OHVs. Unloading facilities are provided. Use of the area is not presently encouraged because no designated trails exist. If a decision to build OHV trails is made, this facility and/or similar trailhead facilities that accommodate a large number of 2 axle vehicles with unloading ramps, restrooms, and overnight facilities will be needed.

3.22d Existing Trail System and Access The Ochoco National Forest and the Crooked River National Grassland Plan specifies travel access direction by Management Area prescription. Some management areas are silent when discussing travel access direction.

For many of the management areas, there is a difference between the Standards and Guidelines for Recreation, and the Standards and guideline for transportation. The Standards and Guidelines for Recreation usually indicate that use off-road, off-trail will be discouraged. The Standards and Guidelines for Transportation indicate that off-road, off-trail motorized access will be prohibited.

The long term Desired Future Condition indicates that the entire National Grassland will be closed to motorized vehicles traveling off-designated routes on a year-round basis. This direction assumes that designated OHV trails will exist to provide opportunities for a variety of users. The Forest Travel Map indicates that motorized use is not permitted during winter months (November 15 to March 31) when damage to resources could occur. The remainder of the year (April 1 to November 14) operation of motorized vehicles off-designated roads and trails is allowed when damage to the resources will not occur. Since currently there are no designated trails for OHV users, the Travel Plan indicates acceptance of off-road, off-trail use on a temporary basis. Once a sufficient amount of designated trails have been constructed on the National Grassland providing a variety of experience levels for various motorized OHV users, the Standards and Guidelines will be fully implemented by prohibiting all motorized travel off designated roads and trails.

In 1987 the Crooked River National Grassland manager designated Henderson Flat, (1500 acres) to manage for growing OHV use on the National Grassland. Due to a Land and Resource Management Plan appeal and subsequent settlement agreement between the appellant and the Forest Service the 31 miles of trail at Henderson Flat is not a designated trail system. The area is still used by OHV enthusiasts.

The Forest and Grassland Management Plans, Appendix A3 and A9, list construction/ reconstruction of 897.7 miles of trail in the first 10 years. The Forest and Grassland have 220.5 miles of existing trail. This does not include two 25 mile horse endurance trails or the 31 miles of undesignated

trail in Henderson Flat. Table 3.4 summarizes existing trails within the Analysis area by difficulty level and type of use. Table 3.5 summarizes both planned and existing trails within the Analysis Area. A complete list of all existing and planned trails can be found in Table 2.11.

Table 3.4 Total Miles of Trail by Type of Use within Analysis Area.

HIKE: Easy= 8.1 miles
More Difficult= 55.8 miles
Most Difficult= 71.6 miles
TOTAL 135.5 miles

NORDIC SKI: Easy= 5.6 miles
More Difficult= 12.6 miles
Most Difficult= 14.0
TOTAL = 32.2 miles

HORSE: Easy= 1.8 miles
More Difficult= 50.4 miles
Most Difficult= 59.7 miles
TOTAL 111.9 miles

MT. BIKE: Easy= 4.9 miles
More Difficult=21.7 miles
Most Difficult=40.8 miles
TOTAL 67.4 miles

OHV: more difficult= 8.1 miles
TOTAL 8.1 miles

SNOWMOBILE: 75.0 miles not rated

Desired Future Condition- First Decade

As stated in the Land and Resource Management Plans for both the Ochoco National Forest and the Crooked River National Grassland a managed trail system will be provided for a variety of uses, including hiking, horse back riding, mountain biking, OHVs, cross-county skiing, and snowmobiles. OHV use, and trail construction and reconstruction, will be allowed where they are not in conflict with other resource objectives.

Table 3.5 Forest and Grassland Trail Miles planned/completed by Type of Use.

Trail Use Type	miles planned	miles completed	remaining
cross-country ski	186	32.2	153.8
snowmobile	314.5	75	239.5
OHV trail	185.9	8.1	177.8
nonmotorized summer trail	397.3	105.2	103.7 291.8
TOTALS	897.7	220.5	677.2

Desired Future Condition- Fifty Years and Beyond

A much larger trail system will be in place and most trails will show substantial use. New trailheads, functional for more user types, will be in place. Loop trails, designated for day hikers will include interpretive features.

3.22e Wilderness and Special Areas There are three Congressionally designated Wilderness. Bridge Creek Wilderness is managed as untrailed due to its small size. There are 17.9 miles of maintained trail in Black Canyon Wilderness and 18.3 miles in Mill Creek Wilderness. Trail uses permitted are hiker and pack & saddle use (horses and llamas). The Wildernesses are managed for semiprimitive and primitive recreation experiences.

There are three Congressionally designated National Wild & Scenic Rivers in the Analysis Area. There are no existing trails within these areas (North Fork Crooked River, Middle Deschutes River, and Lower Crooked River). The Wild & Scenic River Plans which are part of the LRMP plan for 5 miles of nonmotorized trail along the North Fork Crooked River, no trails within the Lower Crooked River, and 4 miles of nonmotorized trail on the Middle Deschutes.

3.3 BIOLOGICAL ENVIRONMENT

3.31 Soils

Soil development in the Analysis Area has been influenced primarily by geologic events and climate, along with the interactions of topography, time, vegetation and biological processes. Soil development has occurred on assorted geologic materials that were covered by volcanic ash from Mt. Mazama (Crater Lake) about 6700 years ago. Basalt and andesitic flows are the primary materials on much of the forest east of Lookout Mountain (approximately 40% of the total Forest and Grassland area). Older andesites, basalts and pyroclastic sediments underlie most of the area to the west of Lookout Mountain (Clarno formation) approximately 23 percent of the total area. Soils are often weathered to clay in this portion of the Forest. Resistant welded tuffs are extensive south of Snow Mountain (approximately 17 percent of the total area). The remaining 20 percent of the Analysis Area contains scattered pockets of highly weathered tuffaceous sediments, geologically recent landslide debri, sedimentary rocks, rhyolite and metasedimentary rocks. The Soil Resource Inventory (Paulson 1977) for the Ochoco National Forest and Crooked River Grassland identified 111 different land types occurring separately or in association with other land types. Land types reflect differences in soil, vegetation and landforms. There are approximately 10-12 different soil types represented in this classification. Three broad soil type categories have been identified for use in management activities: volcanic ash, residual and non-forest soil types.

3.31a Volcanic Ash Soils These soils compose 30 percent of the entire Forest and Grassland area; and approximately half of the forested lands. Ash soils were formed from wide-spread air-fall volcanic ash deposited from Mt. Mazama about 6700 years ago. The present distribution of volcanic ash soils has resulted largely from the influences of topography and elevation on wind and precipitation patterns. Most of the more recent air-fall volcanic ash deposits from Mt. Mazama have been re-worked onto north and east slopes, basins and broad upland plateaus. The present dry climate of the Forest and Grassland does not favor the weathering of volcanic ash soils.

Ash soils range in color from dark brown to yellowish brown, with many deposits being light gray to nearly white when dry. They have a sandy loam texture and are homogenous with little structural development. Gravels and cobbles are

prevalent in these soils due to colluvial action (the movement of rock fragments and other soil materials as a result of gravitational action) and uprooting of trees by wind.

Ash soils are generally found on the more moist sites. These soils compact easily, are susceptible to displacement, but are also the most productive soils on the Forest.

3.31b Residual Soils These soils (comprised of loess, volcanic ash, old weathered volcanic ash and residual materials) comprise 30 percent of the entire Forest and Grassland area, and approximately half of the forested lands. Residual soils are clayey soils that were formed from widespread continuous air-fall volcanic ash deposited between 20 and 30 million years ago. These soils lack the distinct volcanic ash layer, which has either eroded off or mixed with the underlying soil materials. Residual soils are found on south facing slopes, exposed slopes with northerly aspects, and as buried soils on north and east exposures.

As a rule, residual soils have thicker, darker surfaces and exhibit better cohesion than volcanic ash soils. Residual soils are non-gravelly to stony with a loam, silt loam, or clay loam texture. These soils have better structure than ash soils and are more resilient. However, the productivity of residual soils is lower than ash soils, and reforestation on residual soils can be difficult on droughty sites.

3.31c Nonforest Soils These soils make up the remaining 40 percent of the area. These soils are generally more shallow and have a higher rock content than the other two soil types. Nonforest soils with sparse ground cover, low water holding capacity and on southerly aspects have high erosion hazards. Some of these soils have little vegetative cover at the present time, and there is no potential to increase this protective ground cover. There is a high potential for stream sedimentation and other types of degradation resulting from management activities on these soils.

3.31d Landtypes Most Susceptible to OHV Impacts

* Steep slopes greater than 30%, especially those with ash soils (Landtypes B8, C2, C5, C9, L1, N1, N2, P2, R1, R3, Q2, Q9, V2, V6 AND Y2)

* Riparian soils including meadows (landtypes A1, A2, A4, M1, M2, M3, M8)

* Lithic soils/scablands (landtypes B1, B4, B5, C5, E8, H2, H3, J0, J1, N4, N7, N8, N9, P4, P5, Q3, Q4, Q7, R4, R5, S1, V4, V5, V7)

3.32 Watershed

The mean annual precipitation across the Ochoco National Forest is 21 inches with a range of 11 inches at the lower elevations and 33 inches at the higher elevations. Precipitation on the Grassland averages 10.5 inches and ranges from 7 to 19 inches. The average annual precipitation for all watersheds on the Ochoco National Forest is 574,00 acre feet of runoff. More than 80% of the runoff occurs during the period of February through May, with 35% occurring in April.

About 53 percent of the streams on the Ochoco National Forest drain into the Crooked River, a tributary of the Deschutes River. About 20 percent of the streams on the Northeast side of the Forest (Prineville, Big Summit and Paulina Ranger Districts) drain into the John Day Watershed. The majority of the Snow Mountain watersheds drain south into Malheur/Harney Lake Basin. This large basin to the south of the Snow Mountain Ranger District has no outlet. The streams of the Crooked River National Grasslands drain directly into the Deschutes River, the Crooked River, or other tributaries of the Deschutes River.

3.32a Watershed Condition The Forest and Grassland Land and Resource Management Plans (1989), classify stream conditions as either acceptable or unacceptable according to their present physical conditions. Based on data available when the Plan was written, streams were classified as acceptable if they met the following conditions:

> 80% of the banks in stable condition and a minimum of 80% shade (or 100% of potential shade).

Based on this criteria, it was estimated that 50% of the total miles of streams on the Forest were in acceptable conditions (Table 3-33, p 3-79 Ochoco Natl. Forest LRMP, 1989). Streams not meeting these conditions have seasonal problems with turbidity and/or temperature. Extensive, ongoing, stream surveys have been conducted since the LRMP was published and this data would be used in any site specific trail planning.

Stream temperature monitoring was begun in the analysis area in the late 1980's, with monitoring currently being accomplished in over 90 percent of the LRMP designated watersheds. The maximum summer stream temperatures (June, July, August) in 1993 exceeded the Oregon State water quality threshold in 24 of the 53 streams monitored. The maximum temperatures were lower in 1993 compared to the previous year due to higher precipitation and associated base flow levels in 1993 (Ochoco NF 1993). In 1994, 111 sites were monitored for temperature on 69 streams. Of these streams 88% exceeded the State maximum water temperature threshold (Ochoco NF 1994). The 1995 monitoring results have not been published at this time but are expected to be similiar to those in 1993 because of higher summer base flows. Elevated water temperatures can be attributed to reduced stream surface shading, low base flows, wide shallow channels resulting from degraded streambanks, and high air temperatures. Management activities which may degrade shading and bank stability include: riparian road location and other types of floodplain development, timber harvest in riparian areas and along lower sideslopes, and livestock grazing (Grover, 1996. personal communication).

Little or no data is available at the present time on turbidity levels in Forest streams, but fine sediments, as indicated by stream embeddedness, appears to be a problem across most of the Forest.

3.33 Riparian Areas

Riparian zones refer to lands where plants that are dependent on the presence of perennial and/or intermittent water and high water tables occur. Riparian areas include adjacent uplands which have direct relationships with the riparian zone such as shade and Large Woody Material (LWM) recruitment and for the purpose of this analysis will be used interchangeably with PACFISH/INFISH Riparian Habitat Conservation Areas (RHCAs). The road/trail density for the combined uplands and riparian areas in the Analysis Area range from .84 to 2.67 miles per square mile with a cumulative average road density of 1.68 mile/square mile (Ochoco NF 1994). The roads tend to be concentrated closer to streams however, so the actual density in riparian areas are generally higher.

PACFISH/INFISH Riparian Habitat Conservation Areas (USDA Forest Service 1995) include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological function is crucial for the maintenance of the stream's water, sediment, woody debris and nutrient delivery system. The following widths are used unless modified by a watershed analysis or other appropriate NEPA document:

	PACFISH & PRIORITY INFISH WATERSHEDS (from edge)	NON-PRIORITY INFISH WATERSHEDS (from edge)
Fish bearing streams	300 feet	300 feet
Non-fish bearing perennial streams and around ponds, reservoirs, and wetlands greater than 1 acre	150 feet	150 feet
Non-fish bearing intermittent streams, around wetlands less than one acre, and landslides and landslide-prone areas	100 feet	50 feet

The riparian areas can contain mixed conifer stands, Ponderosa stands and water-loving plants such as sedges, alders, and willows. Fully functioning riparian areas are essential for the maintenance of viable fish populations. They are connective corridors between forested habitat for wildlife and provide large woody debris for aquatic insects, fish and terrestrial wildlife. The vegetation in riparian areas is important for filtering sediment from uplands, stabilizing stream bank soils, and providing shade to the water surface. Shade is important for maintaining stable stream temperatures required by most aquatic biota during the summer months.

Activities that occur now or historically have occurred in riparian areas include camping, grazing, road/trail construction, and timber harvest. Many Forest roads are located in the riparian zones and directly along stream channels which have created permanent impacts to riparian areas such as: sedimentation, shade removal, loss of woody debris, channel constriction, and

barriers to up-stream fish migration. A large number of dispersed recreation sites are located in riparian areas and pose potential impacts to fully functioning riparian areas such as soil compaction, soil erosion, and loss of vegetative vigor.

3.34 Fisheries

There are approximately 42 miles of anadromous fish-bearing streams in the Analysis Area that support wild steelhead (Oncorhynchus mykiss), 20 miles of stream that support brook trout (Salvelinus, fontinalis), and over 5 miles that support bull trout (Salvelinus confluentus). Redband trout (Oncorhynchus mykiss) are found in most fish bearing streams. Some of the non-game species present in Forest and Grasslands streams are: Redside shiner (Richardsonius balteatus), Longnose dace (Rhinichthys cataractae), Speckled dace (Rhinichthys osculus), Bridgelip sucker (Catostomus columbianus), and mottled sculpin (Cottus bairdi). Most fish bearing streams in the analysis area are being managed for at least one sensitive species. In addition, higher gradient streams (including non-fish bearing perennial streams) above 4,000 feet on the north slope of the Forest and on streams originating on Lookout Mountain on Big Summit Ranger District are suspected of supporting the Blue Mountain Cryptochian caddisfly (Cryptochia neosa) a sensitive aquatic insect.

3.34a Anadromous Fish The anadromous watersheds of the Forest and Grassland are mostly located in the northern portions of the Forest and along the east side of the Paulina Ranger District up to the falls on the South Fork of the John Day River (Table 3-35, USDA FS 1989). The streams in these watersheds are used by steelhead of the John Day and Deschutes River Basins as well as inland fish species. Steelhead and redband trout are different morhps of the same species (O. mykiss). The difference between the two morphs is that steelhead migrate from streams to the ocean at the age of 2, 3, or 4, then return back to their natal streams to reproduce after 1 to 4 years in the ocean. Redbands live their entire life in freshwater. An estimated 304 spawning adult steelhead utilize streams on the Ochoco National Forest each year (USDA Forest Service 1989 Ochoco NF). Oregon Department of Fish and Wildlife has conducted redd counts (redds are nests in the gravels where salmonids lay eggs), for steelhead since the 1950's along with trap counts and irrigation ditch rotary screen counts. Early surveys were conducted before spawning was complete and tend to under-estimate the total number of redds that were made (Thiesfield 1995). The redd counts have shown great variability from year to year and in low snow pack years, irrigators divert a higher percentage of flow earlier in the year than normal and redd counts tend to be low. Cottonwood Creek experienced its highest redd count in 1989 with 25.6 redds/mile and its lowest redd count of 0.0 redds/mile in numerous years (Thiesfield 1995). The John Day River Basin average has shown a general decline in redd counts since the late 1950's with the exception of 1985-1988. Cottonwood Creek has been below the basin average for redd counts more often than not indicating that steelhead habitat in this stream is less suitable than the "average" creek in the basin. Rock Creek and Black Canyon Creek have also been monitored for redd numbers and have followed the general basin wide redd densities for the John Day River Basin (Montoya 1995).

The anadromous streams in the Analysis Area are currently being managed under the Standards and Guidelines set forth by the Decision Notice for the Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon,

and WA, ID, and portions of CA, commonly referred to as PACFISH (USDA Forest Service and BLM, 1995). Under these guidelines Riparian Management Objectives (RMO's) have been established for all streams in anadromous watersheds. These objectives address specific targets for parameters such as: pool frequency, water temperature, large woody debris, bank stability, lower bank angle, and width/depth ratio. In addition, site specific RMOs may be developed. All Forest and Grassland activities in anadromous watersheds must now be accomplished without retarding attainment of RMO's. Most streams on the Forest and Grasslands have been inventoried for habitat and channel conditions using a Region 6 approved methodology (Grover, 1992). The forest stream data can be compared to the PACFISH RMO's on a site specific scale for analysis of proposed activities.

PACFISH also calls for establishment of Riparian Habitat Conservation Areas (RHCA's) for all streams in anadromous watersheds. RHCA's are portions of the watershed where riparian-dependent resources receive primary emphasis. These areas are established to help maintain the integrity of aquatic ecosystems and avoid adverse effects to anadromous fish. If any modification is proposed for RHCA's generally a complete watershed analysis is required to provide the ecological basis for the change. However, a modification may be accomplished in the absence of a watershed analysis where stream reach or site specific data support the change. In either case, the rationale supporting those changes and the effects of the changes must be documented.

Key Watershed are another element of PACFISH that have been proposed on the Forest for anadromous streams. These are watersheds that either have listed anadromous fish, streams with excellent habitat for mixed assemblages of salmonids, or degraded watersheds with a high potential for restoration. The proposed Key Watersheds in the Analysis Area are: Trout Cr, Rock Cr, Cottonwood Cr, and Black Canyon Cr. The Trout Creek watershed has a high potential for restoration and Rock, Cottonwood, and Black Canyon Cr. have excellent habitat conditions. Rock Cr. and Cottonwood Cr. have roadless portions and Black Canyon Cr. is within a designated Wilderness. The intent of these Key Watershed is to provide a pattern of protection across the landscape where habitat for anadromous fish receive special attention and treatment. They will serve as anchors for anadromous fish stocks and provide colonists for adjacent degraded habitat.

3.34b Inland Fish There are three fish species and one aquatic insect in the Analysis Area that are recognized as "Sensitive" by Region 6 of the U.S. Forest Service and the State of Oregon. These are the Redband trout, the Malheur mottled sculpin (Table 3-36, Ochoco LRMP, 1989), the bull trout and the Blue Mountain Cryptochian caddisfly.

1. The redband trout (O. mykiss) is a Federal candidate species (C2), and is found in most fish bearing streams in the Analysis Area.

2. The Malheur mottled sculpin (C. bairdi ssp.) is a Category 2 species (needs additional information before proporing federal listing). Genetic analysis is presently being conducted on the mottled sculpin in streams of the Harney Basin (Snow Mountain Ranger District).

3. The bull trout (S. confluentus), a Federal candidate species (C2), has been determined to warrant threatened or endangered status by the USDI Fish

and Wildlife Service but is currently precluded by higher priority listings. Bull trout have been documented in Squaw Creek on the Crooked River National Grassland.

4. The Blue Mountain Cryptochian caddisfly (C. neosa) is a Federal candidate species (C2). Larvae have been collected from Lookout Creek and other streams on the Ochoco National Forest. Larvae can only be identified down to genus, but Betts strongly believes that the species collected in the Analysis Area are C. neosa (Betts, personal communication with Russel Johnson, 1995). The Blue Mountain Cryptochian caddisfly is therefore only listed as suspected on the Ochoco National Forest. This aquatic insect appears to range above 4,000 feet elevation in steeper gradient streams on the north slope of the Forest as well as being suspected in Deep Creek on the Paulina Ranger District and in tributaries of Lookout Mountain on the Big Summit Ranger District.

The Analysis Area also has five major reservoirs/lakes that provide sport fishing: Walton Lake, Delintment Lake, Antelope Reservoir, Haystack Reservoir, and Lake Billy Chinook. These reservoirs support trout and other warm water fish, including brown trout (Salmo trutta), kokanee (Oncorhynchus nerka), mountain whitefish (Prosopium williamsoni), smallmouth bass (Micropterus dolomieui), largemouth bass (Micropterus salmoides), and black crappie (Promixis nigromaculatus). Numerous nongame fish are found in these reservoirs and forest streams.

The non-anadramous watersheds in the Analysis Area are currently being managed under Standards and Guidelines set forth in the Decision Notice for the Inland Native Fish Strategy Interim Strategies for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, western Montana and portions of Neveda commonly referred to as INFISH (1995). Under INFISH guidelines, RMOs have been established for all streams in watersheds not covered under PACFISH. These objectives address specific targets for parameters such as pool frequency, water temperature, large woody debris, bank stability, lower bank angle, and width/depth ratio. In addtion, site specific RMOs may be developed. Most Forest and Grassland streams in the Analysis Area have been inventoried for habitat and channel conditions using Region 6 approved methodology (Grover et al., 1992). The Forest stream data can be compared to the INFISH RMOs on a site specific scale for analysis of proposed actions.

INFISH also calls for establishment of Riparian Habitat Conservation Areas (RHCAs) for all non-anadromous streams. RHCAs are portions of the watershed where riparian-dependent resources receive primary emphasis. These areas are established to help maintain the integrity of aquatic ecosystems and avoid adverse effects to inland native fish. If any modification is proposed for RHCAs generally a complete watershed analysis is required to provide the ecological basis for the change. However, a modification may be accomplished in the absence of a watershed analysis where stream reach or site specific data support the change. In either case, the rationale supporting those changes and the effects of the changes must be documented.

Priority watersheds are another element of INFISH that have been proposed in the Analysis Area for non-anadromous streams. These are watersheds that either have excellent habitat or strong assemblages of inland native fish (with a priority on bull trout populations), or provide for meta-population objectives,

or degraded watersheds with a high potential for restoration. The only designated Priority Watershed in the Analysis Area at this time is Squaw Creek on the Crooked River National Grassland because of the documented bull trout population. The intent of these Key Watersheds is to provide a pattern of protection across the landscape where habitat for inland native fish species receive special attention and treatment. They will serve as anchors for potential recovery of depressed stocks, and would also provide colonists for adjacent areas where habitat had been degraded by land management or natural events. Priority watersheds would have the highest priority for restoration, monitoring, and watershed analysis.

3.35 Wildlife

The existing Forest and Grassland Plans state the Desired Future Condition for wildlife is to: "Provide, manage and improve fish and wildlife habitats to maintain viable populations of existing native and desired non-native vertebrate species, including threatened, endangered, and sensitive species."

During the Forest planning process (1989), certain Management Areas were created in the Analysis Area to manage for a variety of wildlife species. This includes game animals such as deer, elk and antelope, and non-game animals such as owls, hawks, and threatened, endangered and sensitive species. Habitat within these management areas are to be managed to assure long-term viability of many species. Standards and Guidelines were developed to achieve these objectives. Travel access management Standards and Guidelines concerning motorized use on and off designated routes were developed, partly to reduce human harrassment of species. Recreation activites and production/extraction of commodity resources are also regulated by the Standards and Guidelines that help meet wildlife objectives.

Management Areas developed with an emphasis on wildlife habitat protection include: Riparian Areas (MA-F15), General Forest Winter Range (MA-F21), Winter Range (MA-F20), Old Growth (MA-F6), Eagle Roosting Areas (MA-F12), Hammer Creek Wildlife/Recreation Area (MA-F18), Research Natural Areas (MA-F5), Wilderness (MA-F1-4), Antelope Winter Range (MA-G1), Metolius Deer Winter Range (MA-G2), Rimrock Springs Wildlife Area (MA-G10), and Juniper Old Growth (MA-G5). Two other Management Areas, although not specifically set up for wildlife that have wildlife objectives, are the Lookout Mountain Recreation Area (MA-F11) and Rock Creek/Cottonwood Creek Unroaded Helicopter Area (MA-F9).

The Ochoco National Forest and the Crooked River National Grassland have become a focal point for hunters due to the large big game populations and trophy size animals. Both motorized and nonmotorized travel due to hunting, recreation, woodcutting, wildlife viewing, etc., is increasing within the Analysis Area. The Forest and Grassland Plans specify desired conditions for wildlife in general and species of interest in detail.

Measures such as road density, acres within 25-400 feet of open and closed roads, and miles of open or closed road/trail can be used to estimate potential affects of motorized vehicles on wildlife. Table 3.6 summarizes acres within the Analysis Area by Management Area and wildlife measures.

Table 3.6 Acres by Management Area, miles of open road, road density, and percent of roads within riparian and scablands.

Table 3.6 Existing Situation		Ochoco National Forest	Crooked River National Grasslands	Total
Wilderness	(MA-F1-4)	37,325	N/A	37,325
Research Natural Areas	(MA-F5)	4,400	110	4,510
Old Growth	(MA-F6)	19,570	N/A	19,570
Eagle Roost Areas	(MA-F12)	570	N/A	570
Dispersed Recreation (sites/acres)	(MA-F14)	213/1970	Unknown	213/1970
Riparian	(MA-F15 & MA-G9)	18,130	2,110	20,240
Bandit Springs	(MA-F16)	1,580	N/A	1,580
Deep Creek	(MA-F19)	720	N/A	720
Winter Range	(MA-F20)	64,130	N/A	64,130
General Forest Winter Range	(MA-F21)	107,360	N/A	107,360
General Forest	(MA-F22)	495,276	N/A	495,276
North Fork Crooked Recreation	(MA-F23)	2,854	N/A	2,854
Hwy 26 Visuals	(MA-F25)	6,850	N/A	6,850
Antelope Winter Range	(MA-G1)	N/A	22,700	22,700
Metolius Deer Winter Range	(MA-G2)	N/A	12,740	12,740
General Forage	(MA-G3)	N/A	59,440	59,440
PACFISH-OCH Riparian		113,334	7500 **	120,834
Scablands		101,635	68,326	169,961
Miles of open roads		~	~	3,673
Miles of closed roads		~	~	984
Miles of obliterated roads		~	~	831
Total miles of roads		~	~	5,489
Road density (General Forest Winter Range)		3.42	Not Available	Not Available
Road density (Winter Range)		2.68	2.65	2.66
Road density (General Forest)		4.01	3.99	4.00
Road density (Old Growth)		2.20	2.66	2.43
Road density (Other allocations)		Not Available	Not Available	2.80
% of roads constructed within a riparian area *		~	~	33%
% of roads constructed on scablands		~	~	16%
% of riparian influenced by road influence zone 1 *		~	~	17%
% of riparian influenced by road influence zone 2 *		~	~	52%
% of scabland influenced by road influence zone 1		~	~	9%
% of scabland influenced by road influence zone 2		~	~	38%

* Roads within riparian areas on the Crooked River National Grasslands were not available for this analysis, but are assumed to be minimal.

** Stream classification was not available for the Crooked River National Grasslands so riparian acres were estimated.

3.35a General Wildlife The Ochoco National Forest and Crooked River National Grassland provide habitat for a wide variety of wildlife. Over 375 different species of herptiles, birds, and mammals are known or expected to occur in these areas.

3.35b Big Game Population management objectives as established by the Oregon Department of Fish and Wildlife (ODFW) are 18,300 for deer and 2,600 for elk on the Forest. The carrying capacity of antelope on the Grassland is 300-350 animals (USDA Forest Service, 1989 Crooked River National Grassland). Elk populations meet or exceed ODFW management objectives, while deer and antelope populations are slightly below the management objectives.

The Forest Plan suggests protecting calving/fawning areas and wallows, minimizing winter range disturbance, and evaluating elk habitat when designing projects. Currently only two of the identified calving sites on the Forest have been closed. One of the closures has connecting roads that are open thus receiving use. The second closure has not been monitored but is thought to be effective. There are numerous wallow sites across the Forest. These known sites receive protection from administratively approved actions during the critical time frame; however, none of the wallow sites have signing or physical barriers to OHV disturbance. Several of the winter range areas have been minimally signed, and one area has signs and physical barriers.

Areas with signs acting as the only closure mechanism were monitored for compliance during the winter of 1993-4. Violations were 15 times above acceptable levels. After physical barriers were installed the compliance rate improved to an acceptable level. Closures in winter range and calving areas that are not signed are not enforceable.

The Habitat Effectiveness Index (HEI) is used to evaluate elk habitat in a planning area. This index is a combination of acres of thermal cover, and open road densities. It is often necessary to close roads to improve elk habitat in a planning area. This is a site specific measurement that varies by management area and even forest type. A more detailed explanation of HEI calculations can be found in the Ochoco National Forest LRMP (1989).

Open road densities are used as a measure of disturbance to big game. The source of disturbance is not the road itself but rather the vehicle traffic. OHV use and overall disturbance and harassment of big game is greatest during hunting season. Roads closed to reduce the open road and trail densities are often violated. It is impossible to definitively identify the amount or areas of OHV use across the forest; however, during hunting season there are very few areas that don't have potential to be traveled by some form of OHV.

Human activities also disturb pronghorn antelope. The Crooked River National Grassland Managment Plan limits motorized vehicles to designated routes in Antelope Winter Range. There are 22,700 acres of antelope winter range on the Crooked River National Grassland that currently receive seasonal protection between Dec. 1 and March 31 but are open the remainder of the year. The Forest Travel Map implies these areas are open to motorized off-designated route use outside the closed season.

Poaching of big game animals has been a problem on the Ochoco National Forest and Crooked River National Grassland over the last few years. The amount of human access to areas increases the potential for poaching (ODFW District Biologist).

3.35c Raptors There are a variety of raptor species that are found on the Forest and Grassland. The Forest and Grassland Plans provide protection from human disturbance during the nesting season (March 1 through August 1). Currently, known nest sites are protected from human disturbance during administratively approved actions, but not from recreationists, woodcutters, mushroom hunters, etc.

3.35d Old Growth and Associated Species Many species of birds and mammals are closely associated with old growth habitat. Desired future conditions for old growth stands are described in the Ochoco National Forest LRMP (1989). Motorized use is limited to designated routes. Approximately 19,570 acres of old growth, and another 19,570 acres of supplemental feeding habitat have been allocated across the Forest (outside of Wilderness and Research Natural Areas) to meet the needs of old growth dependent wildlife, using the pileated woodpecker as the major indicator species.

Not all "old growth" forest is protected in the LRMPs within the Management Allocation of Old Growth (MA-F6). Old Growth allocations are intended to manage habitat for old growth dependent species including pileated woodpeckers. Many of these areas are remote and receive little human disturbance. Some areas however are close to popular recreation areas and receive higher use. Some of the allocated old growth blocks across the forest have been signed, but these signs do not indicate that there are travel restrictions in affect in these areas. The Travel Access Map indicates these areas have year round travel restrictions to designated routes for motorized equipment. Lack of travel access signing and patrol make enforcement of travel restrictions ineffective.

3.35e Riparian and Associated Species Riparian areas are the most critical wildlife habitats on the Forest. Over 75% of the Forest's wildlife species are directly dependent on riparian zones or utilize them more than other habitat areas. Wildlife use streamsides as "connectors", or travel lanes between forested habitats (USDA Forest Service, 1989 Ochoco NF and Crooked River National Grassland), as well as for maternity sites, and safe zones.

The desired future condition for riparian areas in the Analysis Area states that "An abundance of wildlife species should be evident. For management purposes, a special protection area will be apparent. In addition, the streams listed below will receive extra protection to 200 feet from the stream edge, in order to provide "connective habitat" for a variety of wildlife species on the Forest: Trout Creek, Bear Creek, Drake Creek, Pine Creek, Allen Creek, Indian Creek, West Fork Bridge Creek, Porter Creek, Howard Creek, Fox Creek, Cottonwood Creek, Baldy Creek, Little Windy and Windy Creek, and Nicoll Creek. Where existing roads or trails are impacting water quality, steps will be taken to mitigate the problem."

Many riparian areas are not used to the extent they once were by numerous

wildlife species due to the increase in human presence, (management and recreation). Roading has also contributed to the amount of stream channel cutting which has in turn changed the types of vegetation in many riparian systems. Many aspen stands are becoming decadent and have not regenerated due in part to the change in the water table.

The reduction in the amount of aspen and other woody vegetation in conjunction with trapping has eliminated beaver from many of the riparian systems. Historically, beaver dams played an important role in floodplain and vegetative conditions across the Analysis~Area.

3.35f Special Habitats and Associated Species Seeps, springs, bogs, wet areas, and any other unique habitats, often are less than 10 acres in size, and are identified and evaluated on a project level basis and given appropriate protection from administrative activities. These site seldom receive protection from other activities, e.g. woodcutting, OHV use, or general recreation uses.

Unique habitats occupy a very small percent of the total forest land base, yet they are disproportionately important as wildlife habitats. Unique habitats are fragile environments and little or nothing can be done to improve them. Some animals can be eliminated from an area simply through human disturbance such as travel over access roads or trails near their habitats, especially when they are actively rearing young.

The Draft Ochoco Viable Ecosystems Guide for the Ochoco National Forest (Simpson et al. 1994) states, "The plant association specific guides will cover a majority of the forested situations but there are many unique areas on the Forest that require special consideration in the design and implementation of all projects. These will include but are not limited to":

Aspen or potential aspen sites
Wet areas or riparian/forest interface
Rock cliffs, talus slopes, or other rock formations in a forest situation
Unusual forest conditions or edges with non-forest land
Special microsites (e.g. large hollow white fir trees)

3.35g Threatened, Endangered, and Sensitive Species Threatened, Endangered, and Sensitive (TES) wildlife species in the Analysis Area include California wolverine, northern bald eagle, Townsend's big-eared bat, Preble's shrew, California bighorn sheep, upland sandpiper, long-billed curlew, greater sandhill crane, and western sage grouse.

The desired condition stated in the Forest Plan for TES species is to identify existing populations of any threatened, endangered or sensitive species and maintain or improve their habitats. Provide, manage and improve fish and wildlife habitats to maintain viable populations of existing native and desired non-native vertebrate species, including threatened, endangered, and sensitive species (USDA Forest Service, 1989 Ochoco NF).

Western Sage Grouse There are no known sage grouse reproductive grounds (leks) in the Analysis Area but there are several on private land adjacent to the

Forest. Numerous areas have potential to be used as leks or nesting grounds. Sage grouse are known to forage on the Forest during the summer. Many of the Forest lands adjacent to known leks are within big game winter range closures. No OHV restrications are currently signed or enforced in these areas.

California Wolverine In Oregon, the California wolverine occurs in high-elevation forests in the Cascade, Blue, Wallowa, and Ochoco mountains. In central Oregon, it occurs or is suspected to occur in Crook, Deschutes, Jefferson, and Wheeler counties with some regularity (Marshall 1992).

Marshall (1992) states that most wolverine sightings in California and Oregon were at elevations of 5,000 ft. to near timberline. Occasional sightings around the Ochoco National Forest have been at lower elevations (4000 ft.+). Since wolverine are known to scavage and have large home ranges it is possible that most parts of the Ochoco National Forest could have some incidental use.

Hornocker and Hash (1981) found that wolverine seasonal movements effectively separated them from human activity, and they believe that wilderness or remote country with limited human activity is necessary for the maintenance of viable wolverine populations. There are three Wildernesses and four Research Natural Areas across the forest with no OHV use allowed. Average yearly range for males was 163 square miles (104,320 ac.) and for females was 120 square miles (76,800 ac.) (Nowak 1991). Acres of Wilderness and RNA in the Analysis Area total 41,725.

Approximately 560,000 acres in the Analysis Area have non-restrictive travel regulations. On these lands the open road/trail density ranges from 0 miles/square mile to 12 miles/square mile. The 1994 Forest Monitoring Report indicates that the average open road density in General Forest (MA-F22) is 2.31 miles/square mile. This density does not include trails or closed roads on which closures have been ineffective.

Northern Bald Eagle There are four bald eagle nest sites in Crook County (off-Forest), one of which borders the northeastern boundary of the Forest, on the Paulina Ranger District. The "Pacific Bald Eagle Recovery Plan" (USFWS 1986) set an objective of three recovery territories (nesting) for the Ochoco mountains. No roost recovery areas were specified. These nest sites may meet recovery needs for the Ochocos if they continue to be productive.

One bald eagle winter roost area has been identified and is actively being managed as per the management plan. This area has a seasonal restriction on potentially disturbing human activities. The area is signed and compliance has been good.

Preble's Shrew There are 28 records of the Preble's shrew, during 1909-1992, throughout its range in Oregon, Montana, Nevada, Idaho, California, Utah, Wyoming, and Washington. Eleven of these are from Oregon (Harris 1992).

Extensive surveys of the Analysis Area were done in 1991-1993. Over 17,000 trap nights were completed and one Preble shrew was captured on Snow Mountain Ranger District. The Forest has decided to proceed with the tact of assuming the species is present in all high and moderate-probability habitats without further project specific survey.

California Bighorn Sheep There is a small population of bighorn sheep utilizing the Paulina District. Vegetative conditions and disease are the main limiting factors to the expansion of bighorn sheep populations. Increases in the amount of roading and access to areas of the Forest does increase the potential for poaching.

Townsend's Big-eared Bat There are no known maternity roosts or hibernacula on the Forest. There are numerous areas across the Forest that have potential for night roost activity. No protective measures are in place for limiting the type or amount of activity, neither administratively approved nor recreational, around potential roost sites.

Upland Sandpiper The upland sandpiper breeds in northeastern Oregon and north into Canada, central Colorado, and winters in South America (DeGraaf 1991). The Forest does monitor Williams and Gray prairies for presence; however there are no known sightings on the Ochoco National Forest. The upland sandpiper is known to occur is on the Big Summit Prairie, private ground completely surrounded by the Big Summit Ranger District (Carey 1992). Very little suitable nesting habitat exists on the Forest. There are currently no OHV restrictions on their habitat.

Long-billed Curlew Long-billed curlews breed from south to northeastern California, and central Utah, wintering from central California into Mexico. There are 22 records of long-billed curlew sightings in Oregon since 1975. There are no known sightings on the Ochoco National Forest, but habitat exists for the long-billed curlew on the Big Summit Prairie, private ground completely surrounded by the Big Summit Ranger District. Very little suitable nesting habitat exists on the Forest. There are currently no OHV restrictions on their habitat.

Greater Sandhill Crane Sandhill cranes occur in central Oregon, nesting southwest of Bend and near Burns, Silver Lake, and John Day. Sandhill cranes visit Big Summit Ranger District (Carey 1992), and a small portion of the Paulina Ranger District. Although very little suitable nesting habitat exists on the Forest, at least one sandhill crane nest was found on the Big Summit Ranger District, and these cranes are known to nest in private meadows bordering the Paulina Ranger District. The sandhill crane is a ground nester and also requires expansive meadow systems to reproduce in. There are currently no OHV restrictions on their habitat.

3.36 Vegetation

The Analysis Area contains a diverse landscape of varied soils, elevations, and aspects. These features of the land influence climate and vegetation. Approximately 1500 plant species occur within the Analysis Area. These species can be grouped into three broad vegetation formations.

1. **Forested Uplands** (conifer dominated)
2. **Nonforested Uplands** (herbaceous/shrub dominated)
3. **Riparian** (stream/water influenced) Systems located between aquatic and terrestrial environments. These systems are associated with high water tables (at least seasonally) and vegetation that requires or tolerates free or unbound water.

Within each formation individual species and plant communities occur in predictable patterns. Plant associations (units of land classification based on potential vegetation), are useful tools for stratifying the landscape into areas with similar effective environments. This facilitates understanding of observed vegetation patterns and comparisons between sites, especially comparisons of plant response to a given disturbance.

1. Forest Uplands	35 plant associations
2. Nonforest Uplands	15 plant associations
3. Riparian	70 plant associations

These plant associations can then be grouped (plant associations groups or biophysical environments) based on moisture/temperature regime, disturbance regime, and response to disturbance. The Ochoco National Forest has defined six plant association groups for the forested upland formation. Although plant association groups have not yet been defined for the Nonforest Uplands or the Riparian formations, distinctive broad habitat types can be described for these formations.

1. Forest Uplands	Western Juniper woodlands, Ponderosa Pine, Douglas-Fir, Dry Grand Fir, Moist Grand Fir, Subalpine Fir
2. Nonforest Uplands	scablands, grasslands, shrublands
3. Riparian	meadows, springs/seeps, riverine.

Scablands are specialized habitats with very shallow soils and high rock content which are subject to severe water saturation during winter and severe frost heaving (Bates and Jackson, 1987). These shallow lithic soils have a high runoff rate and take a very long time to recover after disturbance (Hall 1980). Seven sensitive plant species use these fragile scablands as their primary habitat. Also, a new plant species discovered in 1994 is found only on scablands of the Ochoco mountains which have certain ecological requirements.

Of the 1500 plant species found in the Analysis Area 23 are listed on the Regional Forester's sensitive species list. Sensitive species are those species that are rare and appear to be declining in population numbers or density. Often times loss of habitat has resulted in limited distribution of many sensitive plant species. These species are designated by the Regional Forester for protection when planning projects to prevent listing as threatened

or endangered under the Endangered Species Act of 1973. Sensitive plant species are typically restricted to a narrow set of habitat conditions. Often they are poorly studied and their reactions to disturbances are not well understood. Most of the sensitive plant species known or suspected to occur in the Analysis Area are found in the Nonforest uplands and Riparian formations. Only one species is found predominately in Forested Uplands (Table 3.7)

Noxious weeds are species that are non-native to this area and have the potential to displace native or desired vegetation and plant communities, often forming complete mono-cultures. The aggressive nature of these species and lack of local pathogens and predators enable these plants to become a large problem for land managers across the west. Noxious weeds can be toxic when ingested by livestock or game, and do not have the binding root system to stabilze soils as well as native species. Noxious weeds are spread by vehicles, contaminated feed for livestock, especially pack animals, wildlife and livestock dispersal, and hikers and campers dispersing seeds while on clothing and by picking and discarding flowers (Sheley, 1994). An Integrated Weed Management Environmental Assessment (Ochoco NF, 1995) is in place to eradicate, control, and prevent noxious weed invasion in the Analysis Area.

Table 3.7 Habitat and Vegetation Formations for Sensitive Plant Species on the Ochoco National Forest and Crooked River National Grasslands.

Sensitive Species	Formation	Habitat
Allium brandegei	Nonforested Uplands	Scablands
Allium campanulatum	Forested Uplands	Dry Grand Fir-PPine PAG's
Artemisia ludoviciana spp estesii	Riparian	Riverine
Astragalus diaphanus var diunus	Nonforested Uplands	Scablands
Astragalus howellii var howellii	Nonforested Uplands	Grasslands
Astragalus peckii	Nonforested Uplands	Scablands
Astragalus tegetariodes	Nonforested Uplands	Shrublands
Botrychium ascendens	Riparian	Springs/Seeps
Botrychium crenulatum	Riparian	Springs/Seeps
Botrychium lanceolatum	Riparian	Springs/Seeps
Botrychium minganense	Riparian	Springs/Seeps
Calochortus longebarbatus var longebarbatus	Riparian	Meadows
Calochortus longebarbatus var peckii	Riparian	Meadows
Carex backii	Riparian	Wet Meadows
Carex concinna	Riparian	Wet Meadows
Castilleja chlorotica	Nonforested Uplands	Shrublands
Cymopterus bipinnatus	Nonforested Uplands	Scablands
Cypripedium calceolus var parviflorus	Riparian	Springs/Seeps
Cypripedium fasciculatum	Riparian	Springs/Seeps
Mimulus washingtonensis	Riparian	Springs/Seeps
Oryzopsis hendersonii	Nonforested Uplands	Scablands
Thelypodium eucosmum	Nonforested Uplands	Scablands
Thelypodium howellii var howellii	Nonforested Uplands	Scablands

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

This chapter describes the expected direct/indirect, short term/ long term, and cumulative impacts of each alternative. The issues and indicators to be used to measure each issue identified in Chapter 1 are used as one of the primary means to evaluate the environmental consequences of each alternative.

The significance of an effect is based upon CEQ Regulation 1508.27. Significance of an action is based upon the context, intensity, and degree of effect an action may have on the physical, social, or biological environment.

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (CEQ Regulation 1508.7).

This evaluation is based on data gathered by members of the Interdisciplinary Team (ID Team) during evaluation of the Analysis Area. Additional information used has been developed from various sources for Forest Planning, Watershed Analysis, Ecosystem Evaluation, and other projects. Detailed specialist reports and biological evaluations are available in the Forest Travel Access Analysis file.

This Chapter is organized by Issues. Within each Issue the environmental consequences of each alternative are explained. Issues are organized in the same order as they are presented in Chapters 2 and 3. In assessing the environmental consequences of the alternatives, the mitigating measures discussed in Chapter 2 are assumed to be fully implemented and reasonably effective.

There were several changes in this Chapter between the Draft and Final version, to respond to public comments and internal review. The majority of changes are clarification of information, research, and conclusions provided in the DEIS. Non-motorized trail miles planned for all alternatives is different than the DEIS based on correction of mathamatical errors. This changed acreage figures presented in analysis for soils, fisheries, recreation, and wildlife. It did not change the overall conclusions or effects decribed in the DEIS. Tables 4.8, 4.9, and 4.10 were changed to clarify data presented and eliminated data that was not used in the analysis.

4.1 ISSUE 1 - SOCIAL

4.11 Overview

The social issue is comprised of several components including conflicts between trail user groups, dispersed camping, and visitor trespass and vandalism of private land.

The proposed action includes clarification of where and when OHVs may travel on developed trails, and where they can ride off-designated routes within the Analysis Area. Some people who ride OHVs in the Analysis Area feel this may reduce the amount of OHV opportunities available. Some nonmotorized trail users feel this means more OHVs would use the forest and detract from their nonmotorized trail experiences. The alternatives vary in how they address trail user conflicts by providing more or less OHV trail, and limiting OHV use in some Management Areas to designated routes only.

4.12 Effects Common to All Action Alternatives

4.12a Recreation experience provided The quality of the recreation experience received by visitors is a combination of the perceived experience (expectations) and the actual experience. Actions Common to All Alternatives includes emphasis on trail user education and signing. Therefore, all alternatives should improve the visitor experience and compliance with resource rules. Appendix X, Trail User Education and Enforcement provides more detail on how this action would be implemented. Providing information to assist visitors in their choices of where to hike would reduce conflicts by helping them select opportunities that meet their expectations prior to the actual trip.

Another measure of the type of recreation experience provided is the Recreation Opportunity Spectrum (ROS) (see Chapter 3). A person seeking opportunities for solitude, challenge, risk, and few encounters with other people would be more likely to meet these expectations by visiting a Primitive or Semi-Primitive setting. Those people seeking a more social, organized experience would more likely meet their expectations in a Roaded Natural or Rural ROS setting. None of the alternatives changes the existing ROS classes in the Analysis Area. Table 3.1 in Chapter 3 shows the percentages of each type of ROS managed in the Analysis Area. Primitive, SPNM and SPM opportunities are limited to 15% or less of the Analysis Area. Future management plans for specific areas should consider site specific ROS changes to increase opportunities for solitude.

4.12b Conflicts between user groups Both resource managers and visitors desire to reduce trail conflicts. A primary means of reducing conflict is to inform trail users of what they can expect to encounter on the trail. Each alternative would accomplish this through information signing posted at all trailheads and access points as well as on visitor maps, brochures, and guides. Appendix x, the Education and Enforcement Plan would assist in accomplishing this objective in all alternatives.

4.13 Direct Effects of Alternatives

4.13a Recreation experience provided One way to assess the mix of user groups and the potential for trail use conflict is to compare the amount of trail provided each group with the daily requirements of that group as well as the ability of adjacent areas to provide for similar opportunities. Tables 4.1 to 4.4 display how well each alternative meets the estimated daily requirements of various recreation groups. Appendix B displays how the daily needs for each user group were calculated. To assess whether proposed trail mileage development in each alternative meets user needs the following rating was used: if less than one day of opportunity provided the user needs were NOT MET; if 1 to 3 days of opportunity were provided user needs were PARTIALLY MET; if more than 3 days of opportunity were provided user needs were FULLY MET. The overall rating considers the combination of miles proposed and how well user daily mileage requirements are met.

Nonmotorized trail mileage was not varied by alternative (except Alternative B) because the LRMP Appendix A meets all non-motorized user needs as proposed. Alternative B only partially meets demand for interpretive trails and barrier-free trails. Alternative B provides the least amount of nonmotorized and motorized trail opportunity.

Alternative B does not meet existing or future trail demand for OHVs or snowmobiles. Alternatives A,C,D,E, and F meet existing and future OHV and snowmobile trail demand. All Alternatives except B provide 6.25 days of snowmobile opportunity. Of those Alternatives that PARTIALLY OR FULLY MEET OHV demand, Alternative A provides the least (2.6 days) and Alternatives D and E provide the most (7 days). Alternatives C and F provide 3.5 days of OHV opportunity.

Table 4.1 Rating of Trail Daily Requirements by User Group for Alternative A.

Alternative A Provides	Daily Requirements for Satisfactory Recreation Experience Are:	# of Days Provided
OHV 186 miles	PARTIALLY MET	2.6 DAYS
snowmobile 314 miles	FULLY MET	6.25 DAYS
hiker 335 miles	FULLY MET	42 DAYS
horse 234 miles	FULLY MET	15.5 DAYS
mountain bike 226 miles	FULLY MET	11.25 DAYS
barrier-free 11 miles	FULLY MET	7.25 DAYS
cross-country ski 186 miles	FULLY MET	23.25 DAYS
interpretive 21.5 miles	FULLY MET	21.5 DAYS

Table 4.2 Rating of Trail Daily Requirements for Alternative B.

Alternative B Provides	Daily Requirements for Satisfactory Recreation Experience Are:	# of Days Provided
OHV 8 miles	NOT MET- Closest designated riding is 2 hours	0 DAYS
snowmobile 75 miles	PARTIALLY MET- Open country always use of roads and back-country	1.5 DAYS
hiker 136 miles	FULLY MET	17 DAYS
horse 112 miles	FULLY MET	7.5 DAYS
mountain bike 72 miles	FULLY MET	3.6 DAYS
barrier-free 3 miles	PARTIALLY MET	2 DAYS
cross-country ski 32.2 miles	FULLY MET	4 DAYS
interpretive 1.5 miles	PARTIALLY MET	1 DAY

Table 4.3 Rating of Trail Daily Requirements for Alternatives C and F.

Alternative C,F Provides	Daily Requirements for Satisfactory Recreation Experience Are:	# of Days Provided
OHV 250 miles	FULLY MET	3.5 DAYS
snowmobile 314 miles	FULLY MET	6.25 DAYS
hiker 335 miles	FULLY MET	42 DAYS
horse 234 miles	FULLY MET	15.5 DAYS
mountain bike 226 miles	FULLY MET	11 DAYS
barrier-free 11 miles	FULLY MET	7.25 DAYS
cross-country ski 186 miles	FULLY MET	23.25 DAYS
interpretive 21.5 miles	FULLY MET	21.5 DAYS

Table 4.4 Rating of Trail Daily Requirements for Alternatives D and E.

Alternative D,E Provides	Daily Requirements for Satisfactory Recreation Experience Are:	# of Days Provided
OHV 500 miles	FULLY MET	7 DAYS

remaining trail uses including snowmobiling, hiking, horse, cross-country ski, mountain bike, barrier-free, and interpretive are the same as Table for Alternatives C,F above.

4.13b Off-designated route travel by OHVs A traditional part of the OHV experience has been off-designated route use. This involves traveling off designated trails and roads to climb hills and explore unroaded/untrailed country. Due to the lack of existing OHV trails in the Analysis Area off-designated route travel has been the method experienced OHV riders use to find challenge and diversity in their riding experience.

Alternatives A, B, C, and D would allow OHV off-designated route travel to continue. All alternatives would allow existing off-designated route travel by snowmobiles to continue on an adequate snowbase. Alternative A allows off-designated route travel on 52% of the Forest and 0% of the Grassland. Alternative B allows the most off-designated route travel to occur- 81% of the Analysis Area (775,620 acres). Alternatives C and D allow off-designated route travel in General Forest (MA-F22) only. These alternatives further restrict off-designated route travel in General Forest to designated routes only in riparian buffers, scablands, and sensitive soils. Motorized travel on scablands in Alternative D is permitted on existing routes including non-system 2-track routes. Motorized travel is limited to designated system roads on scablands in Alternative C. Alternatives E and F allow no off-designated route travel.

Table 4.5 Acres Open to off-designated route OHV use by Alternative

A	B	C	D	E	F
498,826	775,620	379,075	432,401	0	0
52%	81%	39%	45%	0%	0%

4.13c Ease of understanding and implementing Travel Management Direction There is some confusion between the Forests Travel Management Policy of "open unless otherwise closed" and Forest and Grassland Standards & Guidelines. The Standards and Guidelines for the Forest Plan (Alternative A) state that motorized off-designated route use is only allowed in General Forest (MA-F22), Dispersed Recreation (MA-F14) and Bandit Springs (MA-F16). The Standards and Guidelines read as follows:

MA-F22, MA-F14
Motorized use encouraged on designated routes and areas.

MA-F16
Over snow motorized use restricted to designated routes
from Dec 1 to March 30

These guidelines encourage OHV use on designated routes, but do not say off-designated route travel is not allowed. However, it was not intended to

allow off-designated route use by OHVs in the Bandit Springs area from April 1 to Nov 30 (as could be interpreted by the Standard and Guidelines).

It was assumed that motorized off-designated route travel was permitted on the Grassland in General Forage (MA-G3) and Dispersed Recreation (MA-G14). A review of existing Standards and Guidelines shows that OHV use is not allowed off-designated routes on the Grassland. The Standards and Guidelines state:

> Encourage ORV's on designated routes where such use will not conflict with other resources. Legally close ORV routes to standard vehicle traffic. ALLOW NO CROSS-COUNTRY TRAVEL, INCLUDING SNOWMOBILES EXCEPT FOR ADMINISTRATIVE AND PERMITTEE PURPOSES (such as maintaining range improvements or firefighting). Rehabilitate user developed trails and areas. Utilize seasonal closures on certain designated routes. Discourage play areas. (USDA Forest Service 1989 pg 4-101)

It was not possible to exactly quantify acres open or closed to OHV use for Alternative B. Alternative B analysis was based on direction contained on the Forest Travel Map. The Travel Map does not easily correlate to Forest Plan Management Areas. The Map incorporates District Level decisions concerning road closures, the Green Dot Hunting Closure system, and several other hunting season or fire damage closures. The Forest Travel Map is confusing to the public and to Forest Service employees. This results from the difficulty of displaying many types of motorized vehicle closures on a very small scale map, and making it legible. The internal confusion about off-designated route travel is reflected in the Travel Map. The Travel Map does not state where and when motorized off-designated route travel may occur. Alternative B would allow OHV use in areas not intended to be open under the Forest and Grassland LRMPs. It does not implement Desired Future Condition for several Management Areas including: General Forage, Bandit Springs, Deer Winter Range, Antelope Winter Range, and Metolius Deer Winter Range. Alternative B does provide the most opportunity for off-designated OHV use to occur.

Alternatives C, D, E, and F would not allow off-designated route travel by OHVs in Bandit Springs (MA-F16) and Dispersed Recreation (MA-F14) or in dispersed campsites even if they are not allocated in MA-F14. In Alternatives C and D, General Forest (MA-F22) would remain open to off-designated route travel (39% and 45% respectively), with some resource protection restrictions. Additional restrictions would include no off-designated route travel within riparian buffers, scablands, and sensitive soil areas. Alternative D would allow OHV use of both designated routes and non-system routes across scablands. Alternative C would limit OHV travel in scablands and riparian areas to designated routes only. The public may have some difficulty identifying the difference on-the-ground between designated and non-designated routes.

Alternatives A, B, C, and D would all require extensive on-the-ground signing to enforce motorized travel restrictions. Forest Service Law Enforcement officers cannot issue citations for people violating closures unless the closures are signed on-the-ground and a Forest Order is written and posted. General Forest is scattered throughout the Analysis Area and would require a major expenditure of funds, labor, and maintenance to sign every open or closed area.

Alternatives E and F would restrict all motorized travel (except snowmobiles)

to designed routes. Off-designated route travel by snowmobiles would occur in Management Areas that allow motorized winter use on an adequate snow base. Alternative E would require hunters to stay on designated routes for both hunting and game retrieval. Alternative F would permit hunters to retrieve game with OHVs in motorized Management Areas, but they would not be permitted to use an OHV off-designated routes to hunt.

Alternatives A, B, C, and D provide the most opportunity for motorized hunting and game retrieval. Alternatives E and F would restrict OHV use for hunting off-designated routes.

The Standards and Guidelines for the Analysis Area are confusing both internally and externally. This can exasperate trail user conflicts, even when the OHV rider may not have intentionally violated a guideline. The Guidelines are difficult to interpret for Grassland Management Areas, and there is little or no signing on the ground. Alternatives E and F, which implement a policy of "designated routes only" are most easily understood, create less confusion, require less signing, and are most easily enforceable.

4.13d Risk of non-compliance To be successful, all alternatives depend upon visitor awareness and responsibility to some degree. The Forest Service could provide accurate maps, fully sign all regulated areas, and use many media outlets to reach the riding public. However, the visitors must still read and follow the map, read and follow instructions on signs, and believe in the messages they receive. There will always be a small percentage of the public who do not hold the same values as are being promoted through user education programs such as Tread Lightly. This group would have the highest risk of non-compliance. Monitoring and peer pressure may bring some non-compliers into compliance. Appendix E, Education and Enforcement Plan details how non-compliers would be dealt with in all alternatives.

Alternatives E and F contain the easiest to understand travel guidelines and most non-compliance would be from users that would not comply no matter what the guidelines or signs said. This type of non-compliance could only be prevented through vigorous law enforcement. In most cases, the non-complying user is not found, only the resource damage that may result from their actions. Alternatives A and B have the greatest risk of non-compliance. Alternatives C and D have a moderate risk of non-compliance in a smaller area than Alternatives A and B.

4.13e Dispersed Camping The proposed action would limit OHV use of dispersed campsites to entry and exit of the site. Currently, OHV riding occurs within dispersed campsites. Campsites generally occur in either riparian areas or ridgetops. OHV use within these areas may leave visible scars on the landscape including loss of vegetation and soil compaction. Many families enjoy camping with OHVs and prefer to have their family ride nearby so they can watch them. Alternatives A and B would allow this use to continue. Alternatives C,D,E, and F would limit OHV use. Those who enjoy riding OHVs while camping may perceive that their opportunities are more limited with Alternatives C, D, E, and F. Implementation of the Education and Enforcement Plan (Appendix E) is critical to informing campers of this new rule. Rangers may designate specific areas on their District for dispersed camping that allows OHV use (ex: gravel pits).

4.14 Indirect Effects

The combination of high trail miles and no off-designated route travel in Alternative E has the potential to reduce trail use conflict between motorized and nonmotorized users by spreading and separating users and keeping OHV use to predictable areas. Alternative F is similar to Alternative E and could have the same indirect results of reducing conflict and separating use, but does not provide as many days of OHV riding opportunity. Alternatives C and D both provide high OHV trail miles but allow off-designated route use to occur in General Forest. It is probable that the combination of well designed OHV trail system, while keeping General Forest open to off-designated route travel can meet all user needs, while not restricting user freedom-of-choice.

Providing new recreation trails, especially OHV trails, would likely result in increased use within the Analysis Area that may not have occurred if Alternative B (No Action) were implemented. The prediction of increased use is based on data from Henderson Flat on the Crooked River National Grassland (CRNG) and the East Fort Rock OHV Area. There has been a 21.9% increase in OHV at Henderson Flat since October 1992 (Piper, 1996). Data from East Fort Rock shows approximately a 10% per year increase in use, except for 1995- a hot, dry year (East Fort Rock 1995 Annual Report, Duford 1996). This increased use may lead to greater user conflicts and non-compliance.

4.15 Cumulative Effects

Increased trail opportunities and use may result in increased pressure on all recreation facilities within the Analysis Area. The cumulative effects of trail construction, trail use, and off-designated route use on the recreation experience in conjunction with past and foreseeable land management activities may result in trails used to capacity, increased maintenance costs, and increased user conflict. However, many of these impacts can be avoided by properly locating trail systems, following Trail Location and Design Guidelines (Appendix F), and considering the distribution of the trail system throughout Central Oregon. With full development of the BLM Millican Valley Area and the East Fort Rock OHV area, a diversity of OHV experience should keep excessive use of any one area to a minimum.

4.2 ISSUE 2- ADMINISTRATIVE and PERMITTEE (COMMODITY) MOTORIZED USES

4.2a Overview

Off-designated route motorized vehicle use is not limited to recreationists. Forest Service Permittees often use motorized vehicles, including OHVs during the course of their work within the Analysis Area. The permit usually states where and when off-designated route use may occur, however it is not always clear on the permit (ie. woodcutting permits).

4.2b Direct and Indirect Effects

All Alternatives, except Alternative E would continue to allow off-designated route travel in motorized areas if the person has a valid permit. Alternative E would not allow off-designated route use, even for Range Permittees, woodcutters, loggers, or others gathering forest products with a valid permit. Alternative E would be an economic hardship to many Forest permittees. OHVs are commonly used to haul supplies, fix fences, herd cows, reconnaissance and area, inventory, monitor, and much more. If permittees were required to walk or ride a horse their work would take much longer to accomplish.

Administrative use of OHVs off-designated routes would be handled on a case-by-case basis under all Alternatives. If Alternative E were selected, permittees may feel the government is prejudicial in allowing its employees to travel off-designated routes while not allowing permittees the same rights. Administrative use of OHVs would be guided by District Ranger decisions.

4.2c Cumulative Effects

Alternative E may have cumulative effects on Permittees. Watershed analysis, ecosystem management guidelines and other studies place may place more restrictions on grazing, timber harvest, and other commodity extractions, including travel restrictions. Cumulatively, this may place undue hardship on permitees, making their work nonprofitable.

4.3 ISSUE 3 - BIOLOGICAL CONCERNS

4.31 Heritage Resources

The proposed location of all new designated travel routes will be surveyed to locate any heritage sites. If sites are located during the survey, the proposed trail, trailhead, etc. would be relocated or the impacts would be mitigated. These mitigations could include placing gravel over the site to protect it. Designated routes could be developed to guide users away from sites and limit damage to sites from off-designated route use.

Coordination with the Oregon State Historical Preservation Office (OSHPO) would take place on a case by case basis as new travel routes are proposed and the trail locations are identified.

Off-designated route uses have the greatest potential to impact sites since use occurs randomly across the Analysis Area and sites are located in a variety of environments across the Analysis Area. The location of sites are protected from disclosure to prevent intentional destruction and damage. This, as well as the sheer number of sites, prevent sites being identified as areas to avoid. The development and enforcement of designated routes would prevent and limit damage to sites from off-designated route use.

4.32 WATERSHED/RIPARIAN AREAS/FISHERIES

4.32a Overview The protection and improvement of water quality and habitat for anadromous and inland fish is a concern. The management of anadromous and inland fish are guided by existing Standards and Guidelines established in the Forest and Grassland LRMPs, the Region 6 General Water Quality Best Management Practices (BMPs) (USDA FS, 1988), the Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California Environmental Assessment (PACFISH) (USDA FS and BLM, 1995), the Inland Native Fish Strategy Inerim Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of Nevada Environmental Assessment (INFISH) (USDA FS, BLM, 1995), the Ochoco National Forest Viable Ecosystem Management Guide (Simpson et.al. 1994), the Regional Foresters Eastside Forest Plan Amendment No. 1 and 2, and the Columbia River Basin-Wide Anadromous Fish Habitat Management Policy Implementation Guide (within a year). The BMPs and standards and guidelines in the documents listed above need to be followed in trail construction, reconstruction, and maintenance standards. Interim strategies related to recreation and trail construction can be found in the Riparian Management Objectives (RMOs) and the standards and guidelines for General Riparian Area Management, Recreation Management, and Roads Management in Appendix C of PACFISH and Appendix E of INFISH. Riparian concerns include trail encroachment on streams, water channeling and increased runoff, increased sedimentation, and loss of woody debris and shade in streams.

4.32b Effects Common to All Alternatives It is assumed that OHV and non-motorized trail use in the Analysis Area would increase in the next 10 years, based upon data from Forest records and Henderson Flat monitoring.

The amount of sediment delivered to streams is dependent on soil erosivity,

slope, effective ground cover, the area and age of ground disturbance, and distance to the stream. Also, channelization of flow in a trail or wheel track can substantially increase potential sediment delivery. Both slope and channelization increase flow velocity which increases sediment transport exponentially. Impacts on trails can vary depending on soil moisture, slope and surface material, but overall OHVs and horses cause about the same amount of disturbance with the total impact dependent on disturbance width and slope. Hikers can cause substantial disturbance on wet trails, but in most cases are responsible for less potential sediment delivery to streams than other users. About 66% of the sediment delivered to streams comes from within 200 feet of the channel and more than 90% comes from within 400 feet.

Sedimentation and turbidy from trail construction, reconstruction, and on or off trail use within Riparian Habitat Conservation Areas (RHCAs) will probably increase under all Alternatives. Sediment delivery would be most pronounced the first couple of years after trail construction/ reconstruction and will stabilize in about six years, however it would not return to predisturbance levels. As sediment delivery to the stream channels occurs, turbidity levels become elevated downstream. Turbidity resulting from trails should be well under the level detrimental to aquatic biota and is primarily used as an indicator of sediment delivery used in State Water Quality Standards. Sediment delivery to stream channels may effect the spawning success of trout, steelhead and other fish if it occurs while eggs are incubating in the gravels. Fine sediment can clog pore spaces and cause fish eggs to become oxygen deprived. Fine sediment in gravels may also decrease macro-invertebrate abundance and species composition.

Mitigation measures in FS Handbook 2309.11 would be incorporated in site specific plans for trail construction and maintenance. Mitigation measures to reduce temporary and chronic impacts to water quality from erosion include but are not limited to: water bars, side slope reinforcement, avoidance of wet soils, seeps, and steep slopes.

Trail construction and maintenance within RHCA's would meet RMOs and follow standards and guidelines decribed in PACFISH and INFISH. If these are followed the amount of vegetation removed should not decrease shade enough to produce a measurable increase in stream temperatures or decrease long term recruitment of woody debris.

All alternatives restrict motorized use in RHCAs (MA-F15 in Alternative B) to designated trails.

All actions within RHCAs would generally require completion of a Watershed Analysis, however in the absence of a Watershed Analysis, a site specific analysis using stream reach or site-specific data may be used to support the action. In all cases, the rationale supporting the changes and the effects would be documented.

Risk of non-compliance

Non-compliance with any of the restrictions and area closures is likely to occur at some unpredictable level with the implementation of any of the Alternatives. The degree of potential for non-compliance and riparian impacts varies with the amount of trail development, the amount of area open to off trail use, user type, and degree of increased use. Effects from OHV, mountain

bike, and horse use in closed riparian areas may include soil erosion, sediment routing to streams, increased turbidity, and stream bank degradation. Public education and Law Enforcement (Appendix I) may decrease the potential for non-compliance and riparian resource damage.

4.32c Direct Effects by Alternative A summary of acres of potential disturbance from existing and proposed trails and the risk of direct impacts from trails is displayed, by Alternative in Table 4.8. Effects from cross-country ski routes and snowmobiles are not included or analyzed because snow would protect soils and vegetation from disturbance and no trail tread construction would occur.

Under Alternatives A, C, D, E, and F up to 10% of trail miles may be developed within riparian zones. As more trails are developed it is likely that some trails would be developed within RHCAs. Even though mitigation measures in trail construction and maintenance would reduce erosion and impacts to aquatic resources, there would likely be localized impacts to habitats and individuals. The species effected cannot be determined at this level of analysis- site specific analysis would be needed for each proposed trail. Higher trail density in riparian areas could disrupt the natural filtering of surface water through organic layers in the soil and understory vegetation during snowmelt and heavy rains (Lowrance et al. 1984). Trail development in all alternatives, (except B which has no new development), would meet RMOs and effects would be addressed at the site specific level.

Alternative A would develop 583 miles of summer trail. This translates to 135 acres of soil disturbance from motorized trails and a total of 231 acres for all trails. Off-designated route use of OHVs would be allowed in areas permitted by the LRMP if not restricted by subsequent plans. Streams, wetlands, and springs would have the same protection as Alternatives C and D.

Alternative B would develop no new trails. Riparian guidelines specified in the LRMP would be used. There are presently 6 acres of OHV trails constructed in Alternative B with a total of 39 acres of surface disturbance for all trails combined (Table 4.6). This amount of ground disturbance from exiting trails would not cause a statistically measurable degradation to riparian areas, water quality or sensitive fish habitat if trails are maintained to Forest Service Trail Standards.

Alternative C allows off-designated route use of OHVs in General Forest Management Areas (except for riparian, scablands, and slopes over 30%). OHV use would be restricted in Dispersed Recreation Management Areas (MA-F14) except for the purposes of access and camping. Two-hundred and fifty miles of OHV trail and 397 miles of nonmotorized trail would be developed. There would be 182 acres of OHV trail surface disturbance and 278 total acres of summer trail surface disturbance.

Table 4.6 Comparisons of Alternatives and Effects to Water/Riparian/Fish.

	Trails (acres) OHV	Trails (acres) Total	Risk of Impacts from all Trails	Risk of Impact due to non-compliance from not meeting OHV user needs	Risk of Impacts due to non-compliance in permitted off-trail areas	Protection of Aquatic Resources
Alt A	135	231	moderate	moderate	moderate	fair
Alt B	6	39	low	high	high	poor
Alt C	182	278	moderate	low	moderate	good
Alt D	364	460	high	low	moderate	fair
Alt E	364	460	high	low	very low	good
Alt F	182	278	moderate	low	very low	very good

Alternative D allows the same amount of off-designated route use as Alternative C but developes more miles of trails. There would be 500 miles (364 acres) of motorized OHV trail surface from trail development and 460 total acres from all summer trail development. Alternative D would have a greater area of trail surfaces created or established compared to Alternatives C and F. This alternative along with Alternative E has the greatest amount of trail development and potential sedimentation to streams during trail construction, maintenance, and use. New trails will likely be developed within riparian areas but increases in riparian trails will be limited to no more than 10% within the Analysis Area.

Alternative E would allow nonmotorized uses in most Management Areas. Motorized use would be limited to designated routes throughout the Analysis Area. There would be 500 miles of OHV trail and 397 miles of nonmotorized trail developed. This translates to 364 acres disturbed for motorized OHV trail surfaces and 460 total acres disturbed for all summer trail development. The direct effects to riparian areas and aquatic resources from trail construction and maintenance would be the same as in Alternative D. The entire Analysis Area, including RHCA's (USDA FS and BLM 1995) are protected from off-designated route motorized use. The effects from non-motorized, off-designated route use would be negligible because ground disturbance is not as impactive to soils as they are for ATV's, motorcycles, and 4-wheel drive vehicles (David 1995).

Alternative F is similiar to Alternative E except users would be allowed off trails for some purposes and fewer miles of trails would be developed. There would be 182 acres disturbed from OHV trail development and 278 total acres disturbed from development of all summer trails. Riparian areas are protected from off-designated route motorized use. Fewer miles of trail would be constructed or designated with this Alternative compared to Alternatives D and E, which may result in less impacts to aquatic resources from trail

E, which may result in less impacts to aquatic resources from trail construction and maintenance.

Negative impacts to riparian areas, fish habitat, and water quality during trail construction, reconstruction, maintenance, and use are similiar in Alternatives A, C and F due to the moderate amount of trail development. Alternatives A, C, D, E, and F allow greater protection for aquatic resources and riparian ecosystems by incorporating greater restricted areas set forth by the Interim Riparian Guidelines through PACFISH and INFISH.

A positive effect to aquatic resources with Alternatives A, C, D, E, and F is that ability of land and recreation managers to plan and design trails in areas outside of RHCAs or in locations that pose a reduced threat to aquatic resources and water quality.

4.32d Indirect Effects by Alternative

Indirect impacts to riparian and aquatic resources from off trail use by hikers should be minimal. Horses can cause ground disturbance, trampling, and stream bank disturbance. However, the disturbance is normally discontinuous, as from individual hoof prints, sediment should only be transported short distances and recovery rapid. Off trail/road use of wheeled vehicles can cause compaction, puddling, erosion and stream bank degradation. Wheeled vehicles can cause linear ground disturbance. Linear disturbances have a higher risk of channeling water and accelerating erosion. Also, field observations of recreation firewood user roads show slow recovery from compaction, but this may also be a function of weight. If any off-trail use is concentrated enough to start developing trails, impacts would be similiar to direct impacts. If monitoring indicates that impacts are causing degradation of water quality, immediate corrective action is required based on Best Management Practices (BMPs) and Standards and Guidelines.

Indirect effects to aquatic resources from OHV use would result from the lack of enough trails to meet user needs, non-compliance with area closures due either to difficulty in understanding what areas are closed to motorized use or inability to avoid closed areas, and willful disregard of closures and other restrictions.

Lack of adequate OHV trail opportunities in Alternative B (8.1 miles), coupled with increasing use of OHVs would indirectly lead to more off-designated route OHV use. This indirect effect of unmanaged OHV use is the increased risk of damage to riparian soils, vegetation, and stream banks. This may result in increased sediment delivery to streams and stream gravel embeddedness, which have an adverse effect on aquatic invertebrate populations and fish spawning success, egg survival, and fry emergence. Alternative B would continue to apply LRMP standards and guidelines to the Riparian Management Areas (MA-F15) since it appears to not pose an unacceptable risk of "likely to adversely affect" listed stocks of fish or their designated critical habitat or "likely to adversely impact" non-listed fish. All proposed or new projects and actvities (Alternatives A, C, D, E, and F) are required to apply the management measures contained in PACFISH and INFISH. While RHCAa may change, the areas included and the amount of protection is greater than that provided under the

LRMP to Riparian Management Areas (MA-F15) under Alternative B.

Alternative A partially meets OHV trail demand and fully meets all other trail demands. Alternatives C and F fully meet all trail demands. Having partially to fully adequate trail systems should encourage trail use and reduce the risk of impacts to riparian areas and aquatic resources.

Alternatives D and E provide the greatest trail opportunities for all users and may promote more trail use and less off-route use for OHVs. This may be a benefit to water quality and aquatic resources compared to other alternatives because there may be less desire for OHV riders to go off the trails. More trails may encourage use of existing trails that are designed to avoid resource damage.

Risk of non-compliance

Non-compliance with riparian restrictions or area closures due to difficulty in understanding RHCAs or being unable to identify management area boundaries is a risk in all alternatives that allow off-route OHV use. It is very difficult to determine what the width of RHCAs are without a map with the RHCAs varying from 50 to 300 feet based on stream class or wetland area. It would be very easy to accidentally operate an OHV in an area closed to off-route use. Also, it is often hard to recognize when one is approaching a stream or wetland until one is almost in it.

It would be very hard to operate an OHV cross-country without crossing streams, due to the topography of the Analysis Area, with streams extending well into the uplands. There would be very few "legal" crossing opportunities when riding off-designated routes, which in turn could result in a high risk of OHV off-route use which damages RHCAs.

The risk of impacts to aquatic resources due to non-compliance is roughly proportional to the area open to off-route use. Alternative B has the most acres open to off-route OHV riding opportunities, while Alternatives E and F have none. Alternatives A, C, and D provide a moderate amount of opportunity. Increased user education could reduce some non-compliance, however it would not completely eliminate this problem. A small percentage of ATVs, motorcycles, and 4-wheel drivers would disregard restrictions. A disproportional amount of resource damage can be attributed to this group including mudding and hill climbing. This group of users could be expected to use additional miles of trail as an opportunity to access new areas for off-route riding.

4.32e Cumulative Effects There are pervasive problems across the analysis area with high road densities in RHCAs resulting in elevated sediment delivery and flashier flows. About a third of Forest roads are in RHCAs, which account for 13% of the land base (see Table 3.6). Negative effects from system roads may be exacerbated by trails, especially ATV, motorcycle, and 4-wheel drive trails, which function as narrow tread native surface roads (3 - 6 ft). Trail construction may reduce these impacts if mitigation measures include closing roads in impacted RHCAs and/or narrowing the tread on existing roads and using them as trails in the RHCA.

Where past land management activities such as road construction, grazing, and timber harvest have caused stream conditions to not meet Forest Service

standards and Riparian Management Objectives, there is a risk of negative cumulative effects from off designated route motorized use.

4.32f Summary Protection of aquatic resources, for this analysis, is assumed to be approximately equally impacted by direct effects from trail construction, reconstruction, maintenance, and use; indirect effects from off-designated route trail use resulting from trail systems inadequate to meet user needs; and indirect effects from non-compliance resulting from difficulty in identifying boundaries between open and closed management areas. Indirect effects to resources from that portion of users which would operate vehicles wherever they want, not matter what the regulations are, are assumed to be equal across all alternatives. A summary of direct and indirect effects, by alternative, and their combined affect on aquatic resources is displayed in Table 4.8.

While the amount of protection offered to aquatic resources varies by alternative, all alternatives would meet State turbidity and temperature Water Quality Standards if projects are carefully designed, and appropriate Best Management Practices, standards and guidelines, and mitigation measures are applied. Sedimentation may impact individuals or habitat used but should not result in the loss of viability to either fish or aquatic insect populations. The species effected cannot be determined until site specific project analysis is accomplished. Cumulative impacts from past management activities, especially high road densities in RHCAs, may necessitate special mitigation measures at the site specific level in some drainages.

4.33 WILDLIFE

4.33a Overview The effects of trail construction, trail use, use of OHVs off of designated routes, on wildlife species and their habitat is a concern. Effects of OHV's on wildlife may include increased expenditure of energy due to stress from disturbance, destruction of vegetation which supports wildlife habitat and food, lower reproductive success due to disturbance during critical mating and reproductive periods, greater competition for resources due to population concentrations, displacement of animals, and although rare, even mortality.

Alternatives vary by the amount of trail construction proposed and the acres open to off-designated route motorized travel. These differences would affect the ease and effectiveness of implementation and create different trail use patterns across the landscape.

4.33b Effects Common to All Alternatives Project specific analysis for all new trails would occur, including biological evaluations for wildlife, which could mitigate or reduce effects to specific critical wildlife habitat and species.

Effects of Snowmobile Use

There is general agreement between researchers that snowmobiles have less impact on the environment than other OHVs. In general, snowmobiles created little effect on large animals, moderate effects were observed on medium-sized animals, with small animals wintering beneath the snow surface affected the most (Bury, 1978). Snowmobiles compress the snow which collapses subnivean

tunnels, potentially suffocating small animals and creating barriers to subsurface animal movement (Schmid, 1972).

Dorrence, Savage, and Huff (1975) found that big game tend to stay away from trails when used by snowmobiles, but come back when the disturbance is over. During heavy snow years even a small amount of disturbance can reduce energy resources, making it hard for game to survive the winter, and go into spring in a weakened state. Conversly, during light snow years, the effects would not be as great. On the Ochoco, many deer and elk winter on the designated General Forest Winter Range or the Winter Range. Overall, unless big game are being harrassed, there should be minimal negative effects to them by snowmobiles since they tend to use non-snow area.

The California wolverine (Region 6 sensitive) is one of the larger animals that could be affected by snowmobile traffic. Wolverines habituate high elevation country all year. Winter and early spring human access on snowmobiles or all-terrain vehicles could bring about disturbance and conflict (Hornocker and Hash 1981). This is when wolverines are denning and are most susceptible to human distrubance. Effects could be reduced by seasonal restrictions of human activities in potential and known denning areas (Pers. comm. J Copeland).

All alternatives, except B, would develop a total of 314 miles of snowmobile trail and would allow snowmobile use on 498,826 acres of the Analysis Area. Effects to all alternatives would be the same, because in Alternative B, the Forest is open to snowmobile use. Current snowmobile use within the Analysis Area is light compared to snowmobile use on nearby National Forests. However, snowmobile use and demand for trails continues to increase. Even so, effects to large and medium sized animals is anticipated to be minimal. Effects to small mammals Forestwide might not seem high, but local populations in certain areas could be highly affected.

Effects of Nonmotorized Use

All alternatives, except Alternative B, have the same number of nonmotorized trails proposed and would continue to allow off-designated route uses. The effects of nonmotorized surprise encounters between humans and wildlife has not been studied greatly. Many studies on OHV and snowmobile effects have found incidentially that most wildlife species will flee from people on foot more often than people in/on moving OHVs (including snowmobiles). These studies used fairly small sample sizes, so it cannot be assumed that this is true for all species, all of the time. One example of this is sage grouse strutting and OHVs. Sage grouse will continue to strut while the observer is in/on an OHV, but as soon as that person gets out/off, the birds will flush (Pers. comm. Mattson). Again, we cannot assume that all species will react similarly. We must also look at one main difference between motorized and nonmotorized use. Usually, OHVs travel greater distances in a day than non-motorized users do, therefore the potential is higher for disturbing a greater number of animals over a wide area than by hikers, bikers, or horseback riders (Stebbins, 1974).

Nonmotorized use can cause disturbance to all wildlife species, although more impacts to large game animals (through temporary displacement, including hunting) and raptors (disturbing nesting birds) are expected, than to small mammals and herptiles (generally there are no collisions and less habitat disturbed/destroyed by nonmotorized uses).

4.33c Direct Effects of Alternatives

There are many species of wildlife that could potentially be affected by OHV use. This is particulary true for species with low tolerence for human disturbance, habitat specialists, and species with low population levels.

Direct effects of trail construction, trail use by motorized and nonmotorized traffic, implementation/non-compliance of standards and guidelines, and off-designated route OHV use on wildlife may include removal of vegetation, noise disturbance, direct mortality of small or large animals from collision, and reduction of habitat security. These effects vary by degree in each alternative depending upon how many miles of trail are constructed, the type of trail use allowed, and the acres open to off-designated route motorized travel. Table 4.7 displays acres within the Analysis Area open to off-designated route motorized use and miles of trail construction by alternative. This information is analyzed in conjunction with habitat and species specific information.

Effects of trail construction

Trail construction removes vegetation, reducing wildlife habitat, as well as disturbing wildlife during the actual construction phase. Effects of trail construction were measured by acres of vegetation removed through trail construction.

Trail construction in Alternatives D and E would disturb 460 acres of vegetation by constructing 897 miles of trail. Alternatives C and F would disturb 278 acres of vegetation by constructing 647 miles of trail, while Alternative A would remove 231 acres of vegetation by constructing 583 miles of trail. Alternative B builds no new trails, therefore no habitat would be affected. Alternatives D and E would impact the most wildlife habitat and Alternative B would affect the least amount of wildlife habitat through trail construction.

Big game animals, raptors, old growth associated species, and most TES species would not generally be negatively affected by this relatively small amount of vegetation removal when looking at the entire planning area of approximately 950,000 acres. Small mammals such as the Preble's shrew (R6 sensitive), animals that live in special habitats, and especially herptiles would be the species most affected by the physical removal of vegetation. Home ranges for these animals are very small and certain small areas can be critical to the survivability of a local population. These effects could be lessened by careful placement of new trails, such as avoiding riparian and special habitat areas. In Alternatives C, D, E, and F, trail construction in riparian areas would be limited to 10% of total new trail miles, and site specific analysis would identify these sites for mitigation or protection.

Most wildlife species, however, could be impacted by disturbance from actual trail construction, depending on the timing of the work. Many birds and mammals are easily disturbed during the mating and reproductive times of the year. Disturbance during these times could lead to wildlife birthing in poor habitat and nest/den abandonment. Impacts could be greatly lessened by

Table 4.7 Trail Construction, Use, and Off-Designated route use effects on Wildlife by Alternative

	Direct Effects of Alternatives					
Trail Construction	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**	**Alternative E**	**Alternative F**
Total miles new construction (OHV trails existing + new)	583 (190)	0 (8)	647 (250)	897 (500)	897 (500)	647 (250)
Acres Open to OHV Use in...						
Wilderness	0	0	0	0	0	0
Research Natural Area	0	0	0	0	0	0
Old Growth	0	19,570	0	0	0	0
Eagle Roost Areas	0	570	0	0	0	0
Dispersed Recreation	1,970	1,970	0	0	0	0
PACFISH-OCH Riparian	115,444	120,834	0	0	0	0
Winter Range	0	64,130	0	0	0	0
General Forest Winter Range	0	107,360	0	0	0	0
General Forest	495,276	495,276	379,075	432,401	0	0
Antelope Winter Range	0	22,700	0	0	0	0
Metolius Deer Winter Range	0	12,740	0	0	0	0
General Forage	0	59,440	0	0	0	0
Scablands	53,326	169,961	0	53,326	0	0
Acres open to snowmobile use	498,826	498,826	498,826	498,826	498,826	498,826
Total acres of Forest open to OHV use	498,826	775,620	379,075	432,401	0	0
% of Forest open to OHV off-designated route use	**52%**	**81%**	**39%**	**45%**	**0%**	**0%**
Comparison of Alternatives based on area open to OHV use (A 1 indicates highest potential for effects and 6 the least	2	1	4	3	5	5
	Indirect Effects of Alternatives					
Area of Influence Analysis						
% of Forest with vegetation removed for trail construction	<.0005 %	<.0005%	<.0005%	<.0005%	<.0005%	<.0005%
% of Forest influenced by trail use	4%	3%	5%	7%	5%	7%
% of Forest influenced by open roads	37%	37%	37%	37%	37%	37%
% of Forest influenced by open roads and trails	41%	40%	42%	44%	42%	44%
% of Forest influenced by open roads and 40% of closed roads and trails	45%	44%	46%	48%	46%	48%

* The influence zone is an area within 400 feet either side of a road or 200 feet either side of a trail where species sensitive to human activities will avoid or no longer utilize that area

* A furvey among forest biologists showed that about 40% of road closures are violated at some point

seasonal restrictions on trail construction through known breeding and reproductive sites.

Effects of Motorized Use

Motorized trail use, can affect wildlife by increasing human disturbance (ie. noise, harrassment) which reduces habitat security, by concentrating wildlife in smaller areas, and although rare, by direct mortality of small and large animals from collision. Effects of trail use was measured by acres of influence. The more acres disturbed, or more miles of trail built, the potential for negative effects to wildlife increases. For this analysis it was assumed that for OHV use (other than snowmobiles), 90% of the use occurs within 400' of a road or trail on slopes of less than 30%. Ten percent of the use occurs beyond 400 feet. For nonmotorized disturbance it was assumed that human disturbance influences wildlife 200' each side of a trail.

Alternatives D and E, which build the most trail, would have 70,206 acres of wildlife habitat influenced by trail use. Alternatives C and F would have 45,964 acres of wildlife habitat influenced by trail use. Alternative A would have 40,146 acres influenced and Alternative B would have 24,146 acres of wildlife habitat influenced by trail use. Keep in mind, these figues do not include off-road/trail travel. The acres influenced would be higher for all alternatives except for Alternatives E and F. Trail use would least effect wildlife habitat security and individual animals in Alternative B. Overall, Alternatives A and D would have the most negative effects to wildlife habitat security, due to the combination of the most trails built and least restrictions of off-road travel.

When analyzing the off-road potential, Alternative B opens the largest area to off-designated route OHV use, 81% of the Analysis Area. Alternative A would open 52% of the Analysis Area to off-designated route use. Alternatives C and D open 39% and 45% of the Analysis Area to off-designated route motorized use. Alternatives E and F do not allow off-designated route motorized use. As mentioned previously in the FEIS, OHV use is increasing every year. For this analysis, we assume a certain percent of OHV use is off-designated route use, therefore, as use increases, we expect off-designated route use to increase as well. This use could potentially increase effects to wildlife in sensitive areas during reproductive seasons, as these areas would not be protected.

Big Game

Trails and areas designated for OHV use (including snowmobiles) as well as off-route use could receive disturbance and effect big game (deer, elk, and antelope) use of certain areas during the winter and reproductive seasons (when they are most sensitive to disturbance). Big game can adapt to predictable activities in specific areas but surprise encounters cause increased stress and may cause animals to move to other areas. This movement may cause greater risk of predation (Lyon 1979). In the Blue Mountains of Washington, Perry and Overly (1976) found reductions of deer use in habitat 1/8 mile from roads and reductions in elk use 1/2 mile from roads. These distances also varied depending on the amount of hiding cover available. The more cover, the less big game avoided roads. Ferris and Kutilek (1989), along with several other authors, found that although deer will temporarily move away from roads/trails during OHV use their home range patterns did not appear to change. However, even though deer and elk home range patterns do not seem to change permanently,

in some populations there is a definite shift from public to private ground during the hunting seasons (Pers. comm. Ferry). Livezey (1991) also found that traffic during hunting season apparantly displaced deer whose home ranges were within 200 meters of secondary roads. Monitoring from the East Fort Rock OHV Area shows no difference in deer distribution, but acknowledged that effects to deer numbers in the area were unknown. In general, the flight response by elk and deer seem to be a function of distance from a vehicle, and if it was moving or not, rather than the noise itself. The timing of disturbance and forage conditions would determine how detrimental the disturbance is to big game (ie. effects would be more during a hard winter and the trail cut through important winter range, rather than during the summer in the same area). Witmer and deCalesta (1985) suggested seasonal closures during rutting, winter (within winter range areas), and the calving/fawning season to decrease potential negative effects to big game.

Alternatives E and F would affect big game less than any others, due to designated routes. Elk could habituate to these routes and not be disturbed in calving/fawning areas in the spring, or by off-route OHV hunting in the fall. Alternatives A - D would still allow off road travel, potentially increasing the area of big game disturbance. Effects Forestwide should be minimal, but local populations could be affected more, depending on road/trail density and acres of hiding cover in certain areas.

OHV use is usually heaviest during the big game hunting seasons. OHV access may contribute to higher hunter success levels and lower bull/cow and buck/doe ratios than desired by Oregon Department of Fish and Wildlife. Alternative E and F would not allow hunting with OHVs except on designated routes. Alternatives A, B, C, and D would permit a greater amount of the Forest open to off-route travel, potentially increasing resource damage and unethical hunting practices.

Raptors

Many raptor species are very sensitive to human disturbance. Anderson, Rongstad, and Mytton (1990) observed several species of hawks changing home ranges and abandonning nests due to increased human activity in the area. The East Fort Rock OHV Area Monitoring Report 1994 and 1995 reported that a pair of red-tailed hawks nested in a major OHV staging area. They incubated and hatched to young birds, but unfortunately the nest failed because it fell apart. In 1993, a goshawk nest was found near some trails but it was not used again in 1994. Monitoring in 1994 was not sufficient to tell if OHVs had an effect on other raptor nests. Fernandez and Azkona (1993) found that nesting marsh hawks were successful in rearing young in areas of high recreational use, but that the young showed signs of physiological stress.

Alternatives E and F would most benefit raptors due to use on designated routes only. Effects to raptors could be lessened by designing routes to avoid raptor breeding areas or routes going through these areas could have seasonal restrictions. Alternatives A - D would allow off-route travel so the chances of disturbance to raptors during breeding is increased.

Old Growth and Associated Species
The use of OHVs in old growth has the potential to damage or destroy some of the understory vegetation and down woody debris. Vegetative stands in an old growth condition have a diverse array of wildlife species.

No motorized trails would be developed in Old Growth Management Areas (MA-F6) under any of the alternatives. All alternatives, except B would develop trails that may be built within non-designated old growth or adjacent to MA-F6. Directs effects could be increased stress on wildlife and nest/den abandonment. Site specific analysis as trails are developed may mitigate this concern. There is still a concern with Alternatives A - D, having General Forest open to off-route travel. Since most of the Old Growth Management Areas are not signed, a recreationist traveling off-route, would not know that they had crossed from General Forest into the old growth area, and this could lead to effects to wildlife.

Pileated woodpeckers, Cooper's hawks, sharp-shinned hawks, flammulated owls, and great horned owls are found within old growth stands. These species are all sensitive to sound disturbance. Birds chosing nest sites can be displaced from areas with excessive human disturbance. Since motorized trails and motorized travel off-designated routes would not be allowed in MA-F6 under any alternative, potential disturbance to these species is low, except where they nest and feed outside MA-F6.

Riparian Species
Within the Analysis Area there are 1,011 spring sites (160 acres). All alternatives, except B would protect these sites because PACFISH and INFISH standards and guidelines would be followed. Off-designated route motorized use in spring sites would not be allowed in Alternatives C, D, E, and F.

Riparian areas have the highest wildlife species diversity, are important to amphibians, many neotropical migratory birds, and are critical wildlife habitat for many other species. Nonregulated OHV use in riparian areas has the potential to effect wildlife species through displacement, stress, or possible death of herptiles.

All alternatives except B would restrict OHV use to designated routes in the riparian areas. Alternatives D and E would create the most new trail and thus have the highest potential for riparian crossings. This may also increase the non-compliance rate within riparian areas. Alternatives B, C and D have the potential to effect a wide variety of wildlife species, with Alternative B having the greatest impact.

Dispersed camping often occurs within riparian zones. Roads, trails, and dispersed camping within these zones increases the opportunity for human-wildlife contacts and decreases the effectiveness of wildlife habitat through disturbance caused by humans, trampling, soil erosion, soil compaction, and loss of vegetation (Settergren 1977). All alternatives would allow dispersed camping to continue within riparian zones. Alternatives A and B would allow OHV use within dispersed campsites to continue. Alternatives C, D, E, and F would allow OHV use within dispersed campsites on designated or existing routes only while traveling to and from the site.

Special Habitats

There are numerous special habitats that are important to species life cycles. Species that are adopted to these unique habitats are often habitat specialists. There is increased potential to affect the viability of a habitat specialist in a local area, especially if that habitat is already in short supply. OHV use would have little effect on some special habitats due to their inaccessibility, while others could be rendered underutilized by the species.

Alternatives E and F would restrict OHV use to designated routes which would allow for consideration of these special habitats. Alternatives A, C, and D would leave 39% to 52% of the Analysis Area open to motorized off-designated route use. Due to the dispersed nature of special habitats and lack of specific data on each habitat and its species, the effects of OHV use to habitat specialists under each alternative is unknown. The potential for disturbance is higher when more acres are open to off-designated route uses. Alternatives E and F have little potential to effect special habitats, while Alternatives A and B have the greatest potential to effect these habitats.

Threatened, Endangered and Sensitive Wildlife Species

Threatened, endangered or sensitive wildlife species within the Analysis Area include the California wolverine, Preble's shrew, northern bald eagle, western sage grouse, greater sandhill crane, long-billed curlew, upland sandpiper, Townsend's big-eared bat, and California bighorn sheep. Detailed descriptions of each species and their habitat preferences is found in Chapter 3. Trail construction, trail use, and use of motorized vehicles off-designated routes may directly affect species habitat or viability. A summary of potential direct effects of the alternatives on each species is contained in the Analysis File.

Basically, the more acres of land open to off-designated route use by motorized and non-motorized users, the more potential there is to effect TES species or their potential habitat. Alternatives E and F provide the most protection for TES species because no off-designated route motorized use is allowed. Alternative B provides the least protection because most of the Analysis Area is open to off-designated route motorized use. Alternatives C and D provide protection expect in General Forest where 39% and 45% of the Analysis Area is open to off-designated route uses by motorized vehicles.

Effects of Lack of Implementation/Non-compliance

Although Alternatives A and B have winter closures that would protect wildlife, monitoring shows that these closures have not been as effective as they could be. Non-compliance with deer and antelope winter range closures and calving area closures has been fairly high. Signing on-the-ground to enforce these closures is not in place.

A monitoring study to determine the effectiveness of wildlife closures was conducted on the Prineville Ranger District from 1993 to 1995. The results of this study and other wildlife closure monitoring is available in the Travel Access Analysis File. The roads monitored in this study received 15.7 times the allowable use. Gate closures were found to be more effective than signing or public awareness campaigns.

Alternatives A and B have the greatest potential to effect all wildlife

species. Effects would be the same as for motorized use. Alternatives A and B point out the need to provide adequate signing and enforcement in Alternatives C and D for wildlife closures to be effective and compatible with off-designated route motorized use. Alternatives C and D protect the majority of sensitive wildlife habitats, however there would be numerous special habitats that would not receive protection from off-designated route uses. Alternatives E and F would allow motorized use on designated routes only. This would allow the greatest protection of wildlife resources by mitigation and survey of special habitats.

Implementation of Standards and Guidelines, and the effectiveness of area closures can affect wildlife habitat and species. Implementation strategies vary in their ease and ability to be implemented. Based on results of past implementation and effectiveness monitoring, Alternatives A, B, C, and D would be the most difficult to implement and may have low effectiveness, and therefore the greatest potential to affect wildlife. Alternatives E and F would be the easiest to implement and the clearest to the public.

4.33d Indirect Effects to Wildlife

Indirect effects to all wildlife habitat and species from trail construction, motorized and nonmotorized use, and non-compliance with standards and guidelines, may include reduced energy reserves, lower reproductive success rates, greater inter- and intra-species competition for resources (populations may be concentrated in smaller areas temporarily), mortality from displacement and stress, and ultimately lower populations. Overall, Alternatives E and F are the least disturbing to wildlife. Sensitive wildlife areas could be avoided, and mitigation measures implemented to lessen overall impacts to specific areas. Alternatives A, B, C, and D would be very difficult to implement and enforce and would have potential for sensitive habitats and wildlife to be disturbed during critical times of the year. Effects though minimal Forestwide, could be heightened to local populations on a site specific level. Severity of effects would differ based on number of existing roads/trails and number of proposed roads/trails in a specific area.

4.33e Cumulative Effects

Grazing, timber harvest, and other commodity uses of the forest, coupled with increased recreation use has lead to less secure wildlife habitat throughout the Analysis Area. Many subwatersheds are already below Forest Plan standards for elk, so mitigation and monitoring on a site specific or watershed level could assist in maintaining or improving habitat security. Road/trail density, as well as riparian and special habitat areas must be judicially monitored and standards achieved in all Management Areas. For species that have low tolerence for human disturbance, lessened habitat security could leave these wildlife species vulnerable to predators (including hunters) in all phases of their life cycles, leading indirectly to mortality. Other species that seem to adapt to human disturbance and thrive on the habitats we create would probably continue to adapt and would survive in the long run.

4.33f Summary

Cumulatively, the acres of vegetation removed from trail construction in all alternatives would be less than .0005% of the Analysis Area. The habitat disturbed by the influence zone of these trails would be less than 7% of the Analysis Area. Table 4.7 shows the cumulative effect of roads and trails throughout the Analysis Area. When the influence zone of proposed trail miles is added to road influence, up to 44% of the total Analysis Area has less than desirable wildlife habitat security. Lack of compliance with road closures and areas open to off-designated route travel could leave up to 48% of the Analysis Area with less than desirable wildlife habitat security. Alternatives F would add the least negative effect to other cumulative factors effecting wildlife.

4.34 SOILS

4.34a Overview Soil damage may occur from trail construction and off-designated route motorized use. The intensity and duration of the soil disturbance varies by alternative, dependent upon the miles of trail constructed, the location of new trails, and the acres open to off-designated route motorized use.

4.34b Effects common to all Alternatives Impacts that kill the living organisms or that change natural stability could destroy soils. Soils are naturally stabilized by the combined effects of soil structure, plant cover, and the development of crusts. Soil sensitivity to vehicles, riding/pack stock and foot traffic is highly variable, but all data indicate that the natural stability of soils is damaged by these uses.

In this analysis, impacts of OHVs were grouped together rather than analyzing effects by each OHV Class, because the trail miles developed for each class of vehicle are not separated at this programmatic level. The impact of the largest class of vehicle is used. Using various engineering techniques in trail design can lessen the detrimental effects. In terms of non-motorized effects, horses are viewed as being more ground disturbing than humans due to greater weight and strength.

Soils which are very wet, loose, or on steep slopes tend to be particularly susceptible to damage by OHVs, riding/pack stock and foot traffic. The U.S. Bureau of Outdoor Recreation reports that certain OHV users find these types of terrain especially attractive, and accordingly, subject them to heavy use. Such use has a particularly adverse effect because soil damage causes the air and water quality to be reduced; the biotic productivity and aesthetic quality also suffer. When moving rapidly, particularly uphill, OHV tires and treads tear up and dislodge the soil. Riding/pack stock traffic and foot traffic do more damage coming downhill than going uphill (Weaver and Dale, 1978). If the soil is dry, some of it then blows away as dust; if rained on, soil is washed away in the runoff. Soils that reach streams lower water quality for human use, kill beneficial aquatic organisms and hurt valuable fisheries. On soils with vesicular and crytogamic crusts, vehicles, stock and foot traffic can destroy these protective features. Vehicle effects on soil include (Webb and Wilshire 1983):

* Compaction and disruption of surface soil
* Destruction and dispersal of surface stabilizers
* Reduction of infiltration capacity
* Increased frequency and intensity of runoff
* Concentration and channeling of runoff
* Increased erosion and sediment yield
* Increased wind erosion and fugitive dust

Steep slopes of all types are most sensitive to OHV, riding/pack stock and foot traffic impacts especially tracks which are perpendicular to the slope (straight up and down). These travel ways cause rill and gully erosion which contributes to accelerated erosion. Ash soils are particularly susceptible to detrimental displacement and gullying on steep slopes. Rocky slopes on residual soils are more resistant. Some local examples of this type of soil erosion include severely eroded trails from foot traffic at Smith Rock State Park, unauthorized Horse Endurance trails on Big Summit Ranger District, and OHV impacts at Henderson Flat, Mill Creek, and McKay Creek.

Impacts of foot traffic to soils include displacement, especially by people cutting switchbacks on steep trails, which causes raveling of soils. Impacts of riding/pack stock include displacement, especially from cutting switchbacks, widening of trails passing through wet areas or downfall and removal of vegetation. These impacts are greater when the riding/stock is traveling downhill versus uphill.

Scabland soils are elevated, flat-lying, usually basalt floored areas, with little if any soil cover, sparse vegetation and often dry channels scoured into the surface (Paulson 1977). These soils are shallow, often clayey with rapid runoff and high susceptibility to puddling and rutting. Many scablands have areas which pond water during the spring runoff and summer thunderstorms. They are particularly vulnerable to vehicular and large herbivore impacts during this time. The hydrography of scablands is easily damaged by OHV ruts and horse trails. The ruts channel water and increase the erosion potential.

Riparian soils are in direct contact with water and water dependent vegetation. Trail impacts from all types of uses in these areas can severely effect fisheries, water tables and overall riparian function.

4.34c Direct Effects by Alternative Soils can be disturbed by both trail construction and off-designated route uses. Direct effects of trail construction include removal of topsoil, detrimental compaction, detrimental displacement of soil, detrimental mixing, and exposed cutbanks/fill slopes. Direct effects of off-designated route travel on soils include compaction, soil displacement, cover removal, rutting, detrimental mixing, and damage to crytogrammic crust and vesicular crust. Table 4.8 displays the total acres of soil that would be disturbed through trail construction. Acres open to off-designated route motorized travel are also summarized. Effects of cross-country ski and snowmobile trail use are not included or analyzed because snow protects the soils and no tread construction would occur.

In Alternative A, trail construction would directly disturb approximately 231 acres of soil. Alternative A would allow off-designated route motorized travel in Management Areas MA-F22 (General Forest), MA-F14 (Dispersed Recreation), and

Table 4.8 Potential OHV and Non-motorized Use Areas by Alternative

TRAIL USE TYPE	MILES PLANNED	ACRES PLANNED
Alternative A:		
SNOWMOBILE/SKI	NO EFFECT TO SOILS	
OHV TRAIL(6 ft.ave)	186	135
Non-Motorized (2ft)	397	96
Totals Alt A:	583*	231
Alternative B:		
SNOWMOBILE/SKI	NO EFFECT TO SOILS	
OHV TRAIL (6 ft.ave)	8	6
NON-MOTORIZED (2ft)	137	33
Totals Alt B:	245*	39
Alternative C:		
SNOWMOBILE/SKI	NO EFFECT TO SOILS	
OHV TRAIL (6 ft.ave)	250	182
NON-MOTORIZED (2ft)	397	96
Totals Alt C:	647*	278
Alternative D:		
SNOWMOBILE/SKI	NO EFFECT TO SOIL	
OHV TRAIL (6ft.ave)	500	364
NON-MOTORIZED (2ft)	397	96
Totals Alt D:	897*	460
Alternative E:		
SNOWMOBILE/SKI	NO EFFECT TO SOIL	
OHV TRAIL (6ft. ave)	500	364
NON-MOTORIZED (2ft)	397	96
Totals Alt E:	897*	460
Alternative F:		
SNOWMOBILE/SKI	NO EFFECT TO SOIL	
OHV TRAIL (6ft. ave)	250	182
NON-MOTORIZED (2ft)	397	96
Totals Alt F:	647	278

Table 4.9 Comparison of total miles/acres soil disturbance. *

ALTERNATIVE	TOTAL MILES	ACREAGE ALL TRAILS	ACRES OPEN OHV	ACRES OPEN ** NON-MOTORIZED
ALT A	583	231	498,826	959,087
ALT B	145	39	775,620	959,087
ALT C	647	278	379,075	959,087
ALT D	897	460	432,401	959,087
ALT E	897	460	0	959,087
ALT F	647	278	0	959,087

* does not include snowmobiles or cross-country ski trails

** 959,087 acres open to off-designated route hike and horse use (RNA closed); 922,887 acres open to mountain bike use (not allowed in Wilderness or RNAs.

MA-F16 (Bandit Springs). A total of 498,826 open acres have potential for soil damage due to off-road uses.

In Alternative B, trail construction would directly disturb approximately 39 acres of soil. Alternative B would allow 775,620 acres to be open to off-designated route motorized travel. Wilderness, Research Natural Areas and Riparian areas would not be open for OHV use. Alternative B has the highest potential for the most acres of soil to be affected by OHV use.

Trail construction, in Alternative C would directly disturb 278 acres of soil. Alternative C would allow off-designated route motorized travel on 379,075 acres. Areas closed to OHV use include Wilderness and Research Natural Areas. Within riparian areas, scablands and slopes over 30% OHV use would be restricted to designated routes only. Approximately 379,075 acres of soil have the potential to be affected by OHV use.

Trail construction in Alternative D would directly disturb 460 acres of soil. Alternative D would allow off-designated route motorized use on approximately 432,201 acres. Riparian ares, scablands, and slopes over 30% would limit OHV use to designated routes only. Off-road use with forest products permits (woodcutting, special forest products) would be permitted with a valid permit except where resource damage would occur.

Trail construction in Alternative E would directly disturb 460 acres of soil. Alternative E would not allow off-designated route motorized travel in any management areas. This includes limiting hunters, woodcutters and dispersed campers to designated routes only. This alternative has the least potential for negative effects to soils from off-designated route travel.

Trail construction in Alternative F would directly disturb 278 acres of soil. Alternative F would not allow off-designated route motorized travel in any management areas, except for commodity (permitee) users. Approximately 498,820 acres would be open to commodity user off-designated route travel with the potential for some soil disturbance.

Table 4.9 displays the acres of soil disturbed by trail construction and the number of acres open to off-designated route travel by motorized vehicles for each Alternative. Alternative F has the potential for the least effect and Alternative B has the potential for the most effect on the soil resource. Alternatives C,D and E propose the most trail miles/acreage with the least amount of open acreage. Alternatives A and B propose the least amount of trail miles/acreage with the most amount acres open to OHVs.

4.34d Indirect Effects to Soils Indirect effects of trail construction and off-designated route travel by motorized vehicles include an increased potential for peak flows in damaged watersheds, an increased potential for erosion, and increased potential for higher sedimentation in streams, and a decrease in effective cover. There is potential for decreased availability of moisture and nutrients to plants. All alternatives would limit new trail construction to 10% or less in riparian areas and 20% in scablands. Up to 25% of new trails would use existing closed roads. Under the worst case scenario for non-compliance it is possible that up to 500 acres could be impacted by off-designated route motorized travel. This is less than .0005 of the total

Analysis Area. Mitigation, standards and guidelines, and site specific analysis are expected to keep indirect effects of trail construction and use to a nonsignificant level.

4.34e Cumulative Effects to Soils Cumulative effects to soils from trail construction and off-designated route travel include increased soil displacement and compaction due to increased traffic. There is potential for increased user created trails along designated routes. Cumulative effects may include a decrease in productivity of soils due to detrimental disturbances.

Actual proposed trail acreage is minimal (less than .0005% of the Analysis Area) when compared to past, present, and proposed timber harvest, fuels treatment and grazing. The open area acreage has the potential to contribute to increased sedimentation, detrimental compaction and detrimental disturbance. Alternatives C, D, E and F have the most restrictions to protect sensitive soils in riparian areas, scablands, and slopes over 30%.

4.35 Vegetation

4.35a Overview

The effects of off-trail use and trail construction on vegetation are the same regardless of vegetation formation or habitat within a formation. The effects of off route use by OHV's compared to foot and bike travel would be the same, but the intensity of use is greater from a treaded vehicle because of the continuous application of pressure compared to the intermittent pressure applied from hikers. The amount of off-trail use is expected to be greater from OHV's because most hikers and bikers normally stay on trails due to difficulty of off-trail terrain. The effects of trampling by stock animals are also the same as for OHV's. However, rates of recovery vary dramatically from habitat to habitat. In general, sites with deeper soils and greater available moisture recover more rapidly than sites with shallow soils where moisture is limiting. Revegetation of riparian areas may occur in 5-10 years if soils are not severely damaged, while scablands may take hundreds of years to revegetate after similar amounts of disturbance.

4.35b Effects Common to All Alternatives
Plants associated with dunes, meadows, or arid areas (scablands) are most vulnerable to OHV and stock animal activity. The direct effects of OHV and stock animal use on vegetation include surface shearing, crushing of foliage, root systems and seedlings, and grazing by stock animals. Surface shearing uproots and disrupts the root system. These impacts can cause changes in patterns and composition of vegetation. These changes are manifested in reductions in plant density, cover, and species diversity within a site.

Experiments have shown that one pass of a 4-wheel drive truck may significantly reduce the cover and density of annual plant species in dry environments. Woody vegetation may be removed by as few as 10 passes. Small plants are quickly eliminated by OHVs, and shrubs soon deteriorate under repeated impact. On slopes steeper than 25% juniper are especially vulnerable because soil erosion exposes their root systems. OHVs cause injury to roots by breakage and soil compaction, so that larger perennials eventually die. Seeds upon and within the surface layers of soil are crushed, abraded, and displaced. This loss of the seed bank limits many sites ability to recover following heavy OHV

use.

Changes in vegetation may be more or less intense depending on the intensity and rate of use by OHVs and stock animals, local microclimates, topography, and soil types. In general, negative effects of OHV and stock animal use are greatest when soils are wet, however, negative effects are also evident on dry soils.

OHV and stock animal induced changes in plant species composition and in reduced vegetation cover could negatively affect subsurface mycorrhizal development. Mychorrhizal networks occur in all soil types and are essential elements of ecosystem survival, allowing for nutrient exchange amongst plant species. These changes could reduce plant nutrient uptake and negatively affect seedling survival and growth rates.

After reviewing the literature concerning direct effects of OHV use on vegetation, Hall (1980) concluded that:

1. OHV use will reduce perennial plant cover and above ground biomass, and the amount of loss is related to the intensity of use.

2. A reduction in perennial plant density often occurs in an OHV use area especially in areas of moderate to heavy use.

3. Smaller shrubs are often the first to be damaged and eliminated compared to larger individuals or larger species.

4. Annual species are affected in ways similar to perennial plants. However, slight disturbance may cause no measurable reduction or light increases in cover or density of some annual plants.

5. Some perennial plants can recover from OHV impacts if the root crown has not been completely killed, and if sufficient time is given between impacts. On drier sites (scablands) recovery due to resprouting may take 10-20 years. Resprouting may occur faster in Forested and Riparian sites.

OHV activity nearly always results in greatly increased erosion rates. Increases of 8-20 times normal sediment yields have been documented within OHV areas in California (Hinkley et al 1983). The resulting surfaces are often poor for plant germination and growth due to lower organic content (nutrient loading and moisture holding capacity) in the subsurface layers and concentrations of runoff energy in the gullies. In areas where sediments are deposited whole plant communities could be buried which can result in local mortality (Webb & Wilshire 1983).

The effects of trampling from foot travel on off-designated route use has been studied on the east side of the cascades in Washington (Cole, 1993). This study showed that only after 700 passes on the same path is there a negligable impact to vegetation and rates of recovery. The impacts of bicycles on off designated route use is not discussed here because the amount of bicycles that actually venture off trail is minute because of the difficulty to handle the bicycle in open terrain.

The effects of stock trampling on vegetation could be compared to that of an OHV, expecially going downhill. The amount of acreage open to off designated route use by stock, and amounts of stock that use the Ochoco National forest and Crooked River National Grasslands were taken into account when assesssing relative and overall rankings per alternative (table 4.10).

Elimination of disturbances which have produced compositional changes in vegetation may not alone terminate or reverse changes induced by such disturbances. It may only be under the most favorable conditions that seedlings of the original species could become established in competition with those species which have developed under disturbed conditions.

Weedy exotic species, especially noxious weeds, often are introduced along transportation corridors. These species are generally adapted to disturbed conditions and often compete effectively with native vegetation once they become established on a site. The susceptibility of the Analysis Area to invasion by noxious weeds is directly proportional to the amount of new trail construction (increased access) and the amount of area open to off-designated route travel. Introduced perennial grasses may inhibit native shrub or herbaceous community development especially in riparian zones.

Direct effects of trail construction, both motorized and non-motorized, under all Alternatives would include the following, though the degree of effect would vary by acres of vegetation removed for trail construction:

* Direct removal of plants due to trail construction (varies from 40 to 470+ acres by Alternative)
* Irretrievable commitment of habitat to exclusive road/trail use
* Loss of microsite conditions favorable to plant regeneration which limits site recovery
* Loss of soil seed bank
* Loss of cryptogammic crusts in dry environments (scablands) which effects site susceptibility to erosion and site moisture infiltration and retention

Direct effects of off-designated route use under all Alternatives would include the following, though the degree of effect varies by the acreage, type of use, and habitat type utilized:

* Crushing of foliage, root systems, and seedlings
* Increase soil erosion rates and soil compaction.
* Increase areas susceptable to noxious weed invasion by disturbing previously undisturbed sites.
* Increase amount of noxious weed seed introduced and amount of area seed introduced to, depending upon alternative and amount of acreage open to off route travel.
* Localized loss of cryptogammic crusts in arid environments

Plant response to soil compaction varies greatly with species and rainfall during the growing season. Annual grasses are generally less affected by soil compaction than annual dicots.

The type of vegetation cover also would have an impact on degree of effect and rate of recovery. Smaller shrubs are affected more than large shrubs, perennial and annual herbaceous plants are affected more than woody vegetation.

Riparian sites recover faster than forested sites, and scablands recover slower than either riparian or forested sites. Recovery rates vary by vegetation formation due to differences in soil and moisture/temperature regimes. Elimination of disturbance which has already caused species composition changes may not be effective in restoring damaged plant communities

4.35c Direct Effects by Alternative

Table 4.10 displays the number of acres of habitat removed by trail construction and the number of acres of habitat open to off-designated route travel for each alternative. A relative ranking is assigned each alternative for: access to sensitive plant habitat, potential for introduction of noxious weeds and other exotic species which may compete with sensitive species, potential for additional user created routes, and ease of implementation. The percent of each habitat committed to roads, dispersed camping, trails, and off-designated route travel is also compared for each alternative to assess cumulative effects on each habitat. An overall relative ranking was then determined for each alternative's risk to sensitive plant habitat and to vegetation in general across the Analysis Area. These rankings are based on a synthesis of the direct, indirect and cumulative effects to all habitats. A "1" signifies the lowest disturbance level and "6" the highest disturbance level. Based on these rankings Alternative F has the least effect and Alternative B has the greatest effect on both sensitive plant habitat and the overall vegetative resource.

Alternatives E and F have the least detrimental effects to vegetation resources and sensitive plant habitat, because OHV travel is restricted to designated routes only. Alternative E proposes 500 miles of OHV trail development compared to 250 miles for Alternative F. The additional miles of OHV trail in Alternative E may increase the compliance of OHV users in staying on the designated routes compared to Alternative F. However, it also increases access to sensitive plant habitat and may increase the total number of user created routes, especially if the OHV trails are used by other users (hunters, special forest product collectors, dispersed camping, etc.), thus a higher ranking for Alternative E. Cumulative commitment of riparian, scabland, and forestland habitats is low in both Alternatives ranging from 1% of forestland habitats to 3% of scabland habitats to 5% of riparian habitats.

Alternatives C and D have intermediate amounts of detrimental effects to vegetation resources and sensitive plant habitat. Alternative C proposes 250 miles of OHV trail development and Alternative D proposes 500 miles of development. Off-designated route OHV travel is allowed in General Forest (MA-F22) outside riparian habitat conservation areas and scablands in both Alternatives. However, Alternative D also allows OHV travel on existing travel ways within scablands, the habitat type most susceptable to disturbance and the longest rate of recovery. The increased access to sensitive plant habitat and increased potential for exotic species introduction in Alternatives C and D make these Alternatives less desirable from a vegetation viewpoint than Alternatives E or F. Total commitment of riparian habitats is the same (5%) in Alternatives C and D as that found in Alternatives E and F. Total commitment of forestland habitats is the same (58%) in Alternatives C and D. Total commitment of scabland habitats is 3% in Alternative C and 34% in Alternative D. Alternative D has a higher commitment of scabland resources, which increases the potential for user created trails, increases potential for introducing exotic species including noxious weeds, and increases access to

sensitive plant populations, many of which occur only in the fragile scabland habitats. Often times many of these roads are closed but are not well marked, possibly increasing confusion of which roads are available for use, thus increasing the difficulty of implementing Alternative D compared to Alternatives C, E, or F. Enforcement of travel on scablands off-designated routes may be impractical and probably depends on self-enforcement.

Alternative A proposes to develop a total of 190 miles of OHV trail and allows off-designated route travel in General Forest (MA-F22) outside riparian habitat conservation areas, Dispersed Recreation (MA-F14), and Bandit Springs (MA-F16) Management Areas. Cumulative commitment of resources is 5% in riparian habitats, 34% in scabland habitats, and 58% of of forestland habitats. Alternative B shows the existing amount of designated OHV trail in the Analysis Area (8.1 miles or 6 acres). The Travel Map allows off-designated

Table 4.10. Effects on Vegetation by Alternative.

	Forest Plan	No Action	Off Route Travel		Designated Routes Only	
	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Direct Effects (Acres)						
Trail Construction						
OHV	138	6	182	364	364	182
Non-Motorized	110	31	109	109	109	109
Total	248	37	291	473	473	291
Off Route Use - Motorized	498826	775620	379075	432401	0	0
Off Route Use - Non-motorized	963559	963559	963559	963559	963559	963559
Indirect Effects *						
Off Route Use						
Total	4	6	3	4	2	1
Riparian	1	3	1	1	1	1
Scabland	2	3	1	2	1	1
Forest	2	3	2	2	1	1
Introduction of Exotic Spp.	5	6	3	4	2	1
Potential for User Created Routes	5	6	3	4	2	1
Ease of Implementation	4	6	3	5	1	1
* Indirect Effects are displayed by a relative ranking 1= lowest effects 6= greatest effects						
Cumulative Effects (%)						
Riparian (Acres)	120834	120834	120834	120834	120834	120834
Roads	5616	5616	5616	5616	5616	5616
OHV Trails	6	0	25	50	50	25
Non Motorized Trails	11	3	11	11	11	11
Dispersed Rec	718	718	718	718	718	718
Off-Designated Routes Use	0	100594	0	0	0	0
Total	6351	106931	6370	6395	6395	6370
% of Riparian	**5**	**88**	**5**	**5**	**5**	**5**
Scablands (Acres)	169961	169961	169961	169961	169961	169961
Roads	4056	4056	4056	4056	4056	4056
OHV Trails	12	0	28	56	56	28
Non Motorized Trails	22	6	22	22	22	22
Dispersed Rec	674	674	674	674	674	674
Off-Designated Routes Use	53326	113641	0	53326	0	0
Total	58090	118377	4780	58134	4808	4780
% of Scablands	**34**	**70**	**3**	**34**	**3**	**3**
Forestlands (Acres)	672802	672802	672802	672802	672802	672802
Roads	8966	8966	8966	8966	8966	8966
OHV Trails	172	6	141	240	240	141
Non Motorized Trails	77	31	76	76	76	76
Dispersed Rec	580	580	580	580	580	580
Off-Designated Routes Use	380655	561385	379075	379075	0	0
Total	390450	570968	388838	388937	9862	9763
% of Forestlands	**58**	**85**	**58**	**58**	**1**	**1**
Overall Ranking *						
Risk to Vegetative Resource	**4**	**5**	**2**	**3**	**1**	**1**
Risk to Sensitive Plant Habitat	**4**	**5**	**3**	**4**	**2**	**1**
* Overall Effects are displayed by a relative ranking 1= lowest risk 6= greatest risk						

route travel in all Management Areas listed for Alternative A including all riparian habitat conservation areas plus General Forage (MA-G3), Metolius Deer Winter Range (MA-G2), Antelope Winter Range (MA-G1), Deep Creek (MA-F19), Winter Range (MA-F20), General Forest Winter Range (MA-F21), North Fork Crooked River Recreation (MA-F23), and Highway 26 Visual Corridor (MA-F25). Total commitment of resources is 88% riparian habitats, 70% in scabland habitats, and 85% in forestland habitats. Alternatives A and B have the highest potential for user created trails, introduction of noxious weeds, and have significant problems in implementation. Motorized vehicle access to potential sensitive species habitat in Alternative B is greater than Alternative A. Both Alternatives A and B have greater access to sensitive species populations and habitat than Alternatives C, D, E, or F. Conflicting Standards and Guidelines in the existing management plans has created confusion on where off-designated route motorized travel is allowed. This confusion increases the likelihood of damage to vegetation resources and to sensitive plant habitat. Therefore, Alternatives A and B are the least desirable alternatives from a vegetation resource standpoint.

The amount of new trails proposed for non-motorized use is the same for all alternatives except Alternative B. Alternative B proposes no new trail construction. The amount of acreage open to non-designated route use for non-motorized users is the same for all alternatives: 963,559 acres.

Risk of non-compliance

Increasing miles of OHV trail may lower noncompliance of off-designated route travel, however even under the most optimistic conditions non-compliance is expected to average 10%. This use is likely to create some unknown amount of additional user created trails. On Bureau of Land Management land west of the Analysis Area, Millican Valley OHV area experienced creation of 6 new user created routes in one year (Piper, 1995). One of these new trails was 8 miles long. A single pass using a full size 4-wheel drive can cause damage to annual or perennial herbaceous plants. Ten passes can cause damage to woody vegetation. Nonforest sites, especially scablands, are vulnerable to trail creation. New trails can be created by as few as 2 passes using a 4-wheel drive or 5 passes with a motorcycle. Once a track is evident, it invites additional use and trails proliferate.

Potential Effects on Sensitive Species

Effects to sensitive plant species can be evaluated by effects to their habitat. This analysis focuses on the number of acres of habitat removed by trail construction and the number of acres of habitat open to off-designated route travel by motorized vehicles and stock animals. The vegetative formations described in Chapter 3 were used to evaluate acres of habitat. In Table 4.10, an overall ranking for risk to sensitive species habitat is given for each alternative. Also, the higher the risk for spread of exotic species, the higher the risk for these species to invade sensitive species habitat or displace sensitive species popultaions. Riparian areas are considered habitat for 12 sensitive plant species, listed in Table 4.11. Non-forest uplands are considered habitat for 10 sensitive species, listed in Table 4.12. One sensitive species has habitat in forested uplands as shown in Table 4.13.

Table 4.11 Sensitive Plants in Riparian Habitat.

SENSITIVE SPECIES	HABITAT
Artemisia ludoviciana ssp. estesii	Riverine
Botrychium ascendens	Springs/Seeps
Botrychium crenulatum	Springs/Seeps
Botrychium lanceolatum	Springs/Seeps
Botrychium minganense	Springs/Seeps
Calochortus longebarbatus var. longebarbatus	Meadows
Calochortus longebarbatus var. peckii	Meadows
Carex backii	Wet Meadows
Carex concinna	Wet Meadows
Cypripedium calceolus var. parviflorus	Springs/Seeps
Cypripedium fasciculatum	Springs/Seeps
Mimulus washingtonensis	Springs/Seeps

Table 4.12 Sensitive Plants in Non-Forested Upland Habitat.

SENSITIVE SPECIES	HABITAT
Allium brandegei	Scablands
Astragalus diaphanus var diunus	Scablands
Astragalus howellii var howellii	Grasslands
Astragalus peckii	Scablands
Astragalus tegetariodes	Shrublands
Castilleja chlorotica	Shrublands
Cymopterus bipinnatus	Scablands
Thelypodium eucosmum	Scablands
Thelypodium howellii var howelli	Scablands

Table 4.13 Sensitive Plants in Forested Habitat.

SENSITIVE SPECIES	HABITAT
Allium campanulatum	Dry Grand Fir-PPine PAGs

4.35d Indirect Effects to Vegetation

For all Alternatives the indirect effects to vegetation through trail construction and off-designated route use include the following:

* Increased potential for introducing unwanted competing vegetation
* Increased availability of areas for dispersed camping, hunter use, and collection of special forest products through use of user created trails.
* Decrease in available moisture and nutrients due to compaction, rutting, and loss of plant cover
* Reduced mycorrhizal development which lowers nutrient and water uptake by plants and may effect seedling survival and future growth rates
* Increased erosion rates
* Changes in patterns and composition of vegetation
* Reductions in plant density, plant cover, and species diversity
* Annual species may be favored over the more root binding, soil holding perennials.

4.35e Cumulative Effects to Vegetation

For all Alternatives the cumulative effects to vegetation through trail construction and off-designated route use include the following:

* Increased access to areas previously not vulnerable to OHV and stock animal disturbance
* Increase in user created trails along designated trails corridors
* Decrease in available habitat for sensitive plants. This effect is most pronounced in Riparian and Scabland habitats.
* Skid trails and closed logging roads from past timber harvest open up a considerable amount of acreage to off-designated route use.
* Existing cattle and wild game trails also may invite both motorized and non-motorized use.

4.35f Summary

In conclusion, the impacts to vegetation resources from OHV, horse, bike, and foot traffic would vary depending on which alternative chosen. There is no actual impact to sensitive species from this document alone. Once trails are planned mitigations would be needed to avoid sensitve species habitat and populations. This is not a site specific document, therefore impact to individual species and their habitats cannot be assessed. When the decision is made to do site specific trail construction, thorough sensitive species surveys need to be conducted, and potential for exotic species spread to vulnerable areas needs to be assessed.

4.4 UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects of trail use and off-designated route motorized use may occur in all Alternatives. More trail use may introduce more disturbance to the natural environment, disrupting wildlife. Increased use may change the recreation experience from remote to croweded, thereby displacing some people.

Off-designated route motorized use would create more man-made noise in the environment, causing some animals to be displaced in areas of high or moderate

use. This motorized disruption may displace some nonmotorized recreationists, especially if the use occurs in new areas.

4.5 RELATIONSHIP OF SHORT-TERM AND LONG-TERM PRODUCTIVITY

Trails are a long-term commitment of the environment. A trail would last at least 50 years unless a decision to remove and rehabilitate it was made. Trails originally built for Forest Service administrative use in the early 1900's are still in use today. Administrative trails are now used for recreation purposes. If the maximum amount of trails proposed (Alternatives D and E) were built 473 acres of soil vegetation productivity and landscape would be altered.

4.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments are those that cannot be reversed, except perhaps in the extreme long term. The classic instance is when a species becomes extinct; this is an irreversible loss.

Irretrievable commitments are those that are lost for a period of time. If an interstate is constructed through a forest, the timber productivity of the right of way is lost for as long as the highway remains. The construction of the highway signals an irretrievable loss in exchange for the benefits of the highway.

There are no irreversible commitments of resources that would occur with the proposed action. All trails would require site specific analysis prior to construction. If a Threatened, Endangered, or sensitive species exists where trails are proposed, the trail would be moved or effects mitigated.

An irretrievable commitment of soils and vegetation would be made if all trails were built in any alternative. The irretrievable commitment would be .0005% of vegetation removed and placed into bare ground for a travel route. Many trails grow over with vegetation within two years if they are not used. However, use is expected to increase therefore the trail may be an irretrievable commitment.

4.7 OTHER REQUIRED DISCLOSURES

Energy requirements to implement any of the alternatives would include normal use of power tools during trail construction. There are no natural or depletable resource requirements other than those disclosed under irretrievable resource committments. Urban quality would be enhanced through development of additional trails by providing more recreation opportunities, improving the quality of life in the local area.

CHAPTER 5
LIST OF PREPARERS

CHAPTER 5
LIST OF PREPARERS

Name	Contribution	Degree(s)	Experience
Core Interdisciplinary Team			
Jim David	Soil analysis, OHV effects	B.S. Range & Wildland Science M.S. Range Ecology	13 years
Anne Davidson	Wildlife, TES species	B.S. Wildlife Sciences	6 years
Leah King	Vegetation, TES species	B.S. Botany	8 years
Susan Kocis	ID Team Leader recreation, trails Writer-Editor	B.S. Natural Resources M.S. Recreation, Forest Planning	16 years
Mary Maercklein	Heritage Resources	B.A. Anthropology M.A. Anthropology	16 years
Matthew Piper	OHV management, monitoring, implementation		12 years
Jim Seymour	Fisheries, Watershed Riparian, TES species	B.S. Watershed Science (Hydrology)	16 years

Contributors:	
Paul Cuddy	NEPA guidance and review
Dave Owens	NEPA review
Art Currier	NEPA review
Bill Waddel	GIS maps and analysis
Bruce Wright	GIS maps and analysis
Curtis Day	GIS coordination
Tina Welch	Project Support
Phil Horton	Trail analysis
Kelsey DeJean	Roads Monitoring and analysis
Rod Kubitza	Roads data analysis
Matt Crossett	Paulina Recreation Data
Mike Reed	Snow Mountain Recreation Data
Bob Rock	Big Summit Recreation Data
Barb Smith	Prineville District Recreation Data
Dick Duford	Deshutes NF-OHV issues and information
Monte Kuk	DEIS Wildlife analysis
Mike Simpson	DEIS Vegetation analysis
Rob Davies	DEIS Fisheries analysis

CHAPTER 6

LIST OF AGENCIES AND ORGANIZATIONS CONSULTED

CHAPTER 6
LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM FEIS OR NOTICE OF AVAILABILITY WAS SENT

Advisory Council on Historic Preservation
USDA OPA Publication Stockroom
USDA, Animal & Plant Health Inspection Service
USDA, Office of Equal Opportunity
USDA, Soil Conservation Service
USDA, National Agricultural Library
USDA, National Marine Fisheries Service
USDD, U.S. Army Engineers Division
USDD, U.S. Nav;y
USDD, Naval Oceanography Division
Office of Economic Development, EEO Commission
U.S. Dept. of Energy, Office of Environmental Compliance
Environmental Protection Agency
Federal Aviation Administration
Federal Highway Administration
Federal Railroad Administration
General Services Administration
U.S. Dept. of Interior, Office of Environmental Affairs
Interstate Commerce Commission
Northwest Power Planning Council
U.S. Dept. of Transportation
Oregon Department of Fish and Wildlife
Oregon Parks and Recreation Department
Oregon Water Resources Department
Oregon Division of State Lands
Oregon Department of Energy
Oregon Department of Geology and Mineral Industries
Oregon Department of Environmental Quality
Oregon Department of Land Conservation and Development
Oregon Economic Development Department
Oregon State Economist
Oregon Department of Human Services
Oregon Department of Natural Resources
Oregon Forestry Department
Oregon Governor's Forest Planning Team

In addition, this DEIS was mailed to all persons on the Forest mailing lists for Travel Access, Recreation, EIS, and wildlife. The list of names and agencies follows:

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Name	Company Name
HOOPS, LEN	PACIFIC GAS TRANSMISSION
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PARRISH, FRANK	
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PERKINS, EUGENE	
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SMITH, ERNEST M	
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	COMAC
TALCIONI, PAM	COMAC
HOHMAN, KLAUS	COMAC
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TRENHAILE, STEVE	COMAC
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	NATIONAL WILDLIFE FEDERATION
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EDELSON, DAVID	NATURAL RES DEFENSE COUNCIL
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LUDEMAN, WAYNE	NORTHWEST FORESTRY ASSOCIATION
DESMOND, MARTIN	NORTHWEST REFORESTATION
RASOR, LORI	NORTHWEST WOODLANDS
STRINGE, SID	NW STEELHEADERS CHAPTER
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GRAY, MIKE R	OREGON DEPT OF FISH & WILDLIFE
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PARRISH, NORMAN E	OREGON HUNTERS ASSOCIATION
LONSDALE, CONNIE	OREGON NATURAL DESERT ASSOC.
MARLETT, BILL	OREGON NATURAL DESERT ASSOC.
LILLEBO, TIM	OREGON NATURAL RESOURCES
BUCKLEY, JIM	OREGON NORDIC CLUB
CHOATE, MIKE	OREGON STATE SNOWMOBILE ASSOC.
DUFOURD, DICK	OREGON STATE SNOWMOBILE
JOLLIF, GLEN	OREGON TRAIL SNOWMOBILE CLUB
OSTERTAG, GEORGE	
PAWELEK, ROBERT W	OSU EXTENSION SERVICE
TEST, PETE	OSU-GRANT COUNTY EXTENSION SRV
DEBOODT, TIM	OSU/CROOK COUNTY EXTENSION
OTT, RODNEY D	
OWINGS, CECIL	

CHAPTER 7

GLOSSARY

GLOSSARY

A

ACTIVITY - A measure, course of action, or treatment that is undertaken to directly or indirectly produce, enhance, or maintain forest outputs or achieve administrative or environmental quality objectives.

ALLUVIUM - Stream deposits of gravelly sand, silt, or clay.

AFFECTED ENVIRONMENT - The biological, physical, and social environment that will, or may be changed by proposed actions.

ALTERNATIVE - A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision making. An alternative need not substitute for another in all respects.

ANADROMOUS FISH - Fish that are spawned and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce.

ANALYSIS AREA - A delineated area of land analyzed to determine possible responses to the effects from proposed management practices.

ANALYSIS FILE - Documents and files that contain information, site specific prescriptions, records of the analysis process, and decisions made in developing the Silver Creek River Study and Fire Recovery Project Environmental Impact Statement, and which are available at Snow Mountain Ranger District.

B

BASALT - An extrusive rock of volcanic origin; fine grained, dark colored. Very similar to andesite.

BIG GAME - Those species of large mammals normally managed as a sport hunting resources, under state regulations (deer, elk, bear, and mountain lion).

BIOLOGICAL DIVERSITY - The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

C

CLIMAX - (Vegetation) The culminating stage in plant succession for a given site where the composition of the vegetation has reached a highly stable condition, over time, and perpetuates itself unless disturbed by outside forces.

COMPACTION - The packing together of soil particles by forces exerted at the soil surface, resulting in increased soil density and reduced soil porosity.

CONIFER - Evergreen trees and shrubs with cones.

COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) - An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

COVER - Vegetation used by wildlife for protection from predators, for amelioration of weather conditions, or for reproduction.

CULTURAL RESOURCES - The physical remains of districts, sites, structures, buildings, networks, or objects used by humans in the past. They may be historic, prehistoric, archaeological, or architectural in nature. Cultural resources are land based and are non-renewable.

CUMULATIVE EFFECT - The effect on the environment which results from incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7).

D

DEVELOPED RECREATION SITES

Relatively small, distinctly defined area where facilities are provided for concentrated and intensive public use, i.e., campgrounds, picnic areas and swimming areas.

DIRECT EFFECTS - Effects on the environment which occur at the same time and place as the initial cause or action.

DISPERSED RECREATION - Outdoor recreation which occurs outside of developed sites in the unroaded and roaded Forest environment i.e. hunting, backpacking, and hiking.

DIVERSITY - The distribution and abundance of different plant and animal communities and species within an area.

DRAFT ENVIRONMENT IMPACT STATEMENT (DEIS) - A draft publication of the Environmental Impact Statement for a proposed action which the public can assess for the purpose of sending responses to the responsible official. This draft and the public input precede the publication of the Final Environmental Impact Statement. The format and process for these documents is outlined by the National Environmental Policy Act (NEPA).

E

ECOSYSTEM - A complete, interacting system of organisms considered together with their environment (for example; a marsh, a forest, or a lake).

EFFECTS - Physical, biological, social and economic results (expected or experienced) resulting from natural events or management activities. Effects can be direct, indirect and cumulative.

ENDANGERED SPECIES - Any species, plant or animal, which is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act.

ENDEMIC - A taxonomic category (e.g. genus, species, variety) whose natural occurrence is confined to a certain region and whose distribution is relatively limited.

ENVIRONMENT - The aggregate of physical, biological, economic, and social factors affecting organisms in an area.

ENVIRONMENTAL IMPACT STATEMENT (EIS) - A detailed statement in which a major Federal action which significantly affects the quality of the human environment is described, alternatives to the proposed action provided, and effects analyzed.

EROSION - The processes whereby earth or rocky material is worn away by natural forces such as wind, water or ice and removed from any part of the earth's surface. Accelerated erosion is much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence of activities of man, animals or natural catastrophes.

F

FLOODPLAIN - The lowland and relatively flat areas adjoining inland and coastal waters, including, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year.

FORAGE - All browse and non-woody plants available to wildlife for feeding.

FOREST AND RANGE LAND RENEWABLE RESOURCES PLANNING ACT OF 1974 (RPA) - An act of Congress which requires the assessment of the Nation's renewable resources and the periodic development of a national renewable resources program.

FOREST PLAN/FEIS - Ochoco National Forest and Crooked River National Grassland Final Environmental Impact Statement, Land and Resource Management Plan of 1989.

G

GENERAL FOREST - Commercial forest land that is managed for optimal and sustainable levels of timber production. These timber products are provided while also providing animal forage and public use.

GEOGRAPHIC INFORMATION SYSTEM (GIS) - A modeling system using computer mapping and data tables to generate layers of topographic, biologic, and environmental information that can be combined in a number of ways.

H

HABITAT - A place where a plant or animal naturally or normally lives and grows.

HABITAT DIVERSITY - Distribution and abundance of plant and wildlife habitats.

HABITAT EFFECTIVENESS INDEX (HEI) - A combination of both quantity and quality of habitat, including both natural and introduced factors, which produces a specific habitat condition that either limits or generates habitat use by a wildlife species.

HABITAT TYPE - An aggregation of all land areas potentially capable of producing similar plant communities at climax.

I

IMPACTS - See Effects

INDICATOR SPECIES - Species identified in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish.

INTERDISCIPLINARY TEAM (IDT) - A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view to bear on the problem.

IRRETRIEVABLE - Foregone or lost production, harvest, or use of renewable natural resources. For example, when fire destroys a tree plantation, the effect is irretrievable, but the loss of site productivity as measured by the presence of trees is not irreversible.

IRREVERSIBLE - The removal of resources such that they cannot be produced again. This implies most commonly to non-renewable resources such as minerals or cultural resources or to resources such as soil productivity that are renewable only over long periods of time. Loss of renewable resources can also be irreversible as in the replacement of a forest with a road.

ISSUE - See Public Issue

K

KEY INDICATOR - A quantitative measure of how an issue is addressed.

KEY WATERSHED - A watershed that (1) is important to at risk anadromous fish, or (2) provides good anadromous fish habitat, or (3) is readily capable of providing good anadromous fish habitat; and is selected to contribute to a network across the landscape that provides for the long-term conservation of anadromous fish.

L

LAND ALLOCATION - The decision to use land for various resource management objectives in order to best satisfy the issues, concerns, and opportunities identified during the planning process to meet assigned Forest output targets.

LOESS - An stratified deposit of loam that ranges to clay at the one extreme and to fine sand at the other. Often contains shells, bones, and teeth of mammals.

LONG-TERM EFFECTS - Those effects which will be significant beyond the Forest and Rangeland Renewable Resources Planning Act (1974) planning horizon of 50 years.

M

MANAGEMENT DIRECTION - A statement of multiple-use and other goals and objectives, along with the associated management prescriptions and standards and guidelines to direct resource management.

MANAGEMENT REQUIREMENTS (MR) - Specific requirements consistent with 36 CFR 219.27 that are designed to prevent damage to forest resources beyond a minimum threshold established by law or regulation.

MITIGATE - To lessen the severity.

MITIGATION - Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice. The definition in NEPA includes: (a) Avoiding impact altogether by not taking a certain action or parts of an action, (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment, (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and (e) Compensating for the impact by replacing or providing substitute resources or environment.

MONITORING AND EVALUATION - The periodic evaluation on a sample basis of Forest Plan management practices to determine how well objectives have been met and how closely management standards have been followed.

MULTIPLE-USE - The management of all the various renewable resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

N

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) - An act which encourages productive and enjoyable harmony between humans and their environment; promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humans; enriches the understanding of the ecological systems and natural resources important to the Nation; and establishes a Council on Environmental Quality (CEQ) .

NATIONAL FOREST MANAGEMENT ACT (NFMA) - A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act (1974) that requires the preparation of Regional and Forest plans and the preparation of regulations to guide that development.

NEPA PROCESS - An interdisciplinary process, mandated by the NEPA, which concentrates decision making around issues, concerns, alternatives and the effects of alternatives on the environment.

NO ACTION ALTERNATIVE - An alternative where no activity would occur. Development of a No Action alternative is required by regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The no action alternative provides a baseline for estimating the effects of other alternatives.

O

OFF-DESIGNATED ROUTE TRAVEL - traveling off developed forest roads or trails by foot, horseback, bike, or motorized vehicle.

OFF-HIGHWAY VEHICLE - Motorized vehicles designed for off-highway travel, divided into three classes as follows:

Class I - All-terrain vehicle (ATV) defined as three or four-wheeled, motorized off-highway vehicle

Class II - Full width (4WD) vehicles are jeeps, pick-ups, dune buggies, or

other motorized off-highway vehicles
Class III- Motorcycles are defined as two-wheeled drive motorized off-highway vehicles

OLD GROWTH - An old growth stand is defined as any stand of trees 10 acres or greater generally containing the following characteristics: 1) stands contain mature and overmature trees in the overstory and are well into the mature growth stage; 2) stands will usually contain a multi-layered canopy and trees of several age classes; 3) standing dead trees and down material are present; and 4) evidence of man's activities may be present, but does not significantly alter the other characteristics and would be a subordinate factor in a description of such a stand.

OLD GROWTH HABITAT - Habitat of the type, condition and size that satisfy the needs of and provide old growth characteristics for plant and animal species.

P

PACFISH - An inter-agency ecosystem management approach for maintaining and restoring healthy, functioning watersheds, riparian areas, and aquatic habitats within the range of Pacific anadromous fish on Federal lands managed by the USDI Bureau of Land Management and the USDA Forest Service.

PERENNIAL STREAM - A stream which normally flows throughout the year. (See also Stream Classes: Class I: Perennial or intermittent streams.)

POLICY - A guiding principle upon which is based a specific decision or set of decisions.

PRIMARY CAVITY EXCAVATORS - Wildlife species that excavates cavities in snags.

PUBLIC INVOLVEMENT - A Forest Service process designed to broaden the information base upon which agency decisions are made by (1) informing the public about Forest Service activities, plans, and decisions, and (2) encouraging public understanding about and participation in the planning processes which lead to final decision making.

PUBLIC ISSUE - A subject or question of widespread public interest identified through public participation relating to management of the National Forest.

R

RANGER DISTRICT (RD) - Administrative subdivision of the Forest, supervised by a District Ranger who reports to the Forest Supervisor.

RECORD OF DECISION (ROD) - A document separate from, but associated with, an Environmental Impact Statement that publicly and officially discloses the responsible official's decision on the proposed action.

RECREATION OPPORTUNITIES - The combination of recreation settings, activities, and experiences provided by the Forest.

RECREATION OPPORTUNITY SPECTRUM (ROS) - Land delineations that identify a variety of recreation experience opportunities categorized into six classes on a continuum from primitive to urban. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs, based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use. The two classes contained in the project area addressed by the Silver Creek Project are:

Semiprimitive Nonmotorized (SPNM) - Area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other uses. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis. Use of such roads is restricted to minimize impacts on recreational experience opportunities.

Roaded Natural (RN) - Area is characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of man. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

RECREATION VISITOR DAY (RVD) - Recreation use of National Forest sites, or areas of land or water, which aggregates 12 visitor-hours. May consist of 1 person for 12 hours, 12 people for 1 hour, or any equivalent combination of continuous or intermittent recreation use by individuals or groups.

RIPARIAN AREAS - Areas with distinctive resource values and characteristics that are comprised of an aquatic ecosystem and adjacent upland areas that have direct relationships with the aquatic system. This includes floodplains, wetlands, and all areas within a horizontal distance of approximately 100 feet from the normal high water line of a stream channel, or from the shoreline of a standing body of water.

RIPARIAN MANAGEMENT OBJECTIVES - Quantifiable measures of stream and stream- side conditons that define good anadromous fish habitat, and serve as indicators against which attainment, or progress towards attainment, of goals will be measured.

RIPARIAN HABITAT CONSERVATION AREAS - Portions of watersheds where riparian dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where propoer ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris and nutrient delivery systems.

RIPARIAN ZONE - Those terrestrial areas where the vegeation complex and microclimate conditions are products of the combined presence and invluence of perennial and/or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows.

RIPRAP - A structure build of broken rock or other material used for protecting exposed soil from erosion along channels or road ditches.

S

SCOPING - The procedures by which the Forest Service determines the extent of analysis necessary for a proposed action, i.e., the range of actions, alternatives, and impacts to be addressed, identification of significant issues related to a proposed action, and establishing the depth of environmental analysis, data, and task assignments needed.

SEDIMENT - Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.

SENSITIVE SPECIES - Those plant or animal species which are susceptible or vulnerable to habitat alterations from management activities. Species that have appeared in the Federal Register as proposed for classification and are under consideration for official listing as endangered or threatened species, that are on an official state list, or that are recognized by the Regional Forester as needing special management to prevent their being placed on Federal or state lists.

SERAL - A plant and animal community which is transitional in stage of succession, being either short-or long-term. If left alone, the seral stage will pass, and another plant and animal community will replace it.

SIGNIFICANT - As used in NEPA, an effect that has important context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected region, interests, and locality. Intensity refers to the severity of impacts (40 CFR 1508.27).

SNAG - A standing dead tree usually greater than 5 feet in height and 6 inches in diameter at breast height. The interior of the snag may be sound or rotted.

SOIL PRODUCTIVITY - The capacity of a soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture, nutrients, and length of growing season.

SOIL RESOURCE INVENTORY (SRI) - A report containing soils information and associated data on geology, climate, vegetation, and landforms. The report is in the form of soil maps, mapping unit descriptions, tables displaying soil characteristics, and tables of soil management interpretations, useful to land managers as an aid to multiple use management.

SPECIAL HABITAT - Special and unique wildlife habitats are found throughout the Ochoco National Forest. These habitats are generally natural forest openings, riparian areas, and meadows or geologic features such as cliffs, talus, riparian areas and caves.

SUITABILITY - The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable and available for a variety of individual or combined management practices.

SUMMER RANGE (SR) - An area that is potentially capable of supporting big game during the summer use period.

T

THERMAL COVER - Vegetative cover used by animals to modify the adverse effects of weather (adapted from Thomas 1979); a forest stand that is at least 40 feet in height with the canopy cover of at least 70 percent.

TIERING - The elimination of repetitive discussions in an environmental document by incorporating by reference the discussion of similar issues in an environmental impact statement of broader scope. For example, a project environmental assessment could be tiered to the Forest Plan EIS.

THREATENED AND ENDANGERED SPECIES (T&E) - Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range as designated by the USDI Fish and Wildlife Service.

TRAIL - A developed, constructed pathway for recreational or administrative travel by motorized or nonmotorized means. For purposes of this EIS trail refers only to pathways constructed to Forest Service Trail standards as described in Forest Service Manual 2309.12.

TURBIDITY - The optical property of water as affected by suspension of material such as sediment, i.e., the muddy or cloudy state of water.

V

VIABLE POPULATION - A viable population is one which has sufficient numbers and distribution of reproductive individuals as to provide a high likelihood that species will continue to exist and be well-distributed throughout its range.

VISUAL RESOURCE - The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

W

WATERSHED - A portion of the forest in which all surface water drains to a common point. Watersheds can range from a few tens of acres that drain a single small intermittent stream to many thousands of acres for a stream that drains hundreds of connected intermittent and perennial streams.

WATERSHED ANALYSIS - A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis is a stratum of ecosystem management planning applied to watersheds of approximately 20 to 200 square miles.

WATER YIELD - The measured output of the Forest's streams.

WETLANDS - Those areas that are inundated by surface or ground water with a frequency sufficient, under normal circumstances, to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands include marshes, bogs, sloughs, potholes, river overflows, mud flats, wet meadows, seeps, and springs.

WILDLIFE HABITAT DIVERSITY - The distribution and abundance of different plant and animal communities and species within a specific area.

WINTER RANGE (WR) - The area available to and used by big game through the winter season.

ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations with an asterisk are defined in the Glossary

AF	Analysis File*
BLM	Bureau of Land Management
CE	Cumulative Effect*
CEQ	Council on Environmental Quality*
CFR	Code of Federal Regulations
CFS	Cubic Feet Per Second*
DEIS	Draft Environmental Impact Statement*

EIS	Environmental Impact Statement*
FDR	Federal Development Road
FEIS	Final Environmental Impact Statement
FOREST PLAN/FEIS	Ochoco National Forest and Crooked River National Grassland Final Environmental Impact Statement, Land and Resources Management Plan of 1989.*
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System*
HEI	Habitat Effectiveness Index
ID Team	Interdisciplinary Team*
NEPA	National Environmental Policy Act*
NFMA	National Forest Management Act*
NRHP	National Register of Historic Places
ODFW	Oregon Department of Fish and Wildlife
OHV	Off-Highway Vehicle*
ORV	Off-road vehicle (same as OHV)
PETS	Proposed Endangered and Threatened Species
PPM	Parts per Million
RD	Ranger District*
RHCA	Riparian Habitat Conservation Area*
RMO	Riparian Management Objective*
RNA	Research Natural Area
ROD	Record of Decision*
SHPO	State Historic Preservation Office
SPM	Semiprimitive Motorized (ROS Classification)
SRI	Soil Resource Inventory*
T&E	Threatened and Endangered Species*
USDI	United States Department of the Interior
WR	Winter Range*

CHAPTER 8
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LITERATURE CITED

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APPENDICES

APPENDIX A

Appendix A ANALYSIS AREA TRAIL PLANS BY USER TYPE.

Trail Name	Appendix A- LRMP	Existing	Miles Planned	Miles built	Horse	Hike	Bike	Ski	Snowmobile	OHV	Wilderness
801 Ponderosa		yes	1.6	1.6		1.6	1.6	1.6			
802 McGinnis		yes	4.4	4.4		4.4	4.4	4.4			
804 Lookout Mtn		yes	6	6	6	6	6				
805 Round Mtn	yes	yes	6	9.5	9.5	9.5	9.5				
806 Ochoco Way		yes	2.9	2.9		2.9	2.9	2.9			
807 Chev Spring	yes	yes	3	3.2	3.2	3.2	3.2				
807A Line Butte	yes	yes	3	2.7	2.7	2.7	2.7				
808 Independent Mine	yes	yes	6.1	6	6.1	6.1	6.1	6.1			
808a Independent Tie		yes	2.5	2.5				2.5	2.5		
809 Walton lake	yes	yes	1	1		1					
810 Woodpecker		yes	2.5	2.5		2.5	2.5	2.5			
810A Bike Tie		yes	0.5	0.5		0.5	0.5	0.5			
811 Easy		yes	1.5	1.5		1.5	1.5	1.5			
813 Barnhouse		yes	3.5	3.5	3.5	3.5					
815 Keaton	yes	yes	10	4.5	4.5	4.5					
816 Fry		yes	3	3	3	3					
819 Cottonwood		yes	4	4	4	4	4				
820 Black Canyon	yes	yes	12.3	12.3	12.3	12.3					yes
820A Payton	yes	yes	3	2	2	2					yes
821 South Prong		yes	4.5	4.5	4.5	4.5					yes
823 Rock Creek	yes	yes	7	7		7					
824 Sugar Creek		yes	1	0.5		0.5					
Sugar Interp	yes		2			2					
831 Green Mountain		yes	8.1	8.1	8.1	8.1	8.1			8.1	
832 Twin Pillars		yes	6.3	6.3	6.3	6.3					yes
833 Wildcat		yes	6.5	6.5	6.5	6.5					yes
833A Belknap		yes	2.3	2.3	2.3	2.3					yes
835 Cougar	yes	yes	6.6	8.2	8.2	8.2	8.2	8.2			
837 Steins Pillar	yes	yes	3.3	1.8	1.8	1.8	1.8				
840 Hammer Creek	yes	yes	6	5	5	5					
850 Rimrock Springs	yes	yes	1.2	1.2		1.2					
853 Gray Butte	yes	yes	6	4.5	4.5	4.5	4.5				
870 Delintment Creek			5			5					
871 Fire Overlook		yes	0.5	0.5		0.5					
822 Rim/Apple/Back	yes		11.8			11.8	11.8	11.8			
Divide Cabin Interp	yes		2				2				
Allen Creek	yes		14		14	14	14				
Keaton Tie	yes		2		2	2	2				
NF Crooked River	yes		5			5					
Dry Creek	yes		3		3	3					
Delintment Lake	yes		5			5					
E-W Tie	yes		30		30	30	30		30	30	
Hat-East Walk	yes		2.5		2.5	2.5	2.5				
Youngs Butte	yes		2		2	2	2				
Oneil Creek	yes		5		5	5	5				
Wind Creek	yes		5		5	5	5				
Silver Creek	yes		26		26	26					
Steins Loop	yes		3		3	3	3				
Battle Ridge	yes		3		3	3					
Ochoco Divide Interp	yes		1.5			1.5					
Old Summit E-W tie	yes		23		23	23	23		23	23	
Emmigrant Falls	yes		2			2					
East Wolf	yes		3.2		3.2	3.2	3.2				
Scissorsville Interp	yes		3			3					
Wildflower Walk	yes		2			2					
Hwy 26 Bikepath	yes		13				13				
Allen/Walton Interp	yes		6.5			6.5					
Bandit Interp	yes		3			3					
OHV Routes	yes		95							95	
ORV Trail D5	yes		16.5							16.5	
Horse Endurance	yes		25		25		25				
Willow Creek	yes		12.3			12.3					
E-W Tie D5	yes		13.3		13.3	13.3	13.3			13.3	
Deschutes/ Squaw	yes		5		5	5					
E-W Intertie	yes		11					11			
Grant Meadows	yes		8					8			
Nature Creek	yes		4					4			
Canyon Creek	yes		7					7			
Ochoco Creek	yes		13					13			
Rager	yes		4					4			
Phone Line	yes		4					4			
Tamarack	yes		4					4			
Dry Creek	yes		10					10			
Miscellaneous D4	yes		10					10			
Carol Butte	yes		2					2			
Brush Creek	yes		7					7			
Crystal Creek	yes		7					7			
Snow Course D2	yes		11					11			
Spanish Peak	yes		5					5			
Maures	yes		20					20			
Miscellenous D4	yes		15					15			
Big Summit	yes	yes	33	33					33		
West 42	yes	yes	3.5	3.5					3.5		
Peterson Lava	yes		3.5						3.5		
East 42	yes	yes	18	18					18		
Little Summit Prairie	yes		8						8		
Watson Military	yes		9						9		
Summit D2	yes		8						8		
Dick's Bluff D3	yes		20						20		
West 27	yes	yes	18	18					18		
Misc. D4	yes		35						35		
Old Summit	yes		10	10					10		
Potter Meadow	yes		3						3		
58 Road	yes		4						4		
3610 Route	yes		7						7		
12 Road	yes		8						8		
Bear D2	yes		3						3		
Maures	yes		25						25		
Misc. D4	yes		30						30		
Chev Spring	yes		13						13		
TOTALS			897.7		233.7	334.7	226	186	314.5	185.9	
Miles existing				220.5	112	135.6	71.7	32.2	75	8.1	
miles left to build			677.2		121.7	199.1	154	153.8	239.5	177.8	

NOTE: Miles planned does not equal sum of all user trail miles because some are multiple use trails.
*** Trail location may vary from those listed as planned depending upon resource considerations

APPENDIX B

APPENDIX B
DISTANCE CONSIDERATIONS FOR TRAIL NETWORKS

Most trail users are very versatile and can use whatever trail is provided them as long as the trail design meets the users' intended use. The following estimates were used to guide trail planning in the Analysis Area. Some of the average daily trail mile requirements were changed between the DEIS and FEIS based upon additional information. Daily requirements for mountain bike and ski trails have increased. OHV requirements have been further refined by vehicle class and the daily mileage requirement reduced. Trail requirements were based on reliable publications, contacts with experienced users and organizations, and various individuals from trail management agencies.

Type of Use	Daily Requirements for Typical Outing
OHV (includes	Class I: 6-30 miles/day, 4 ft wide- recommend 60% of trail system allow Class I and II Class II: 10-40 miles/day, 6 ft wide- recommend 20% of system allow Class I, II, and III Class III: 50 -150 miles/ day, 2 ft wide- recommend 20% of system allow this use only Overall average used: 70 miles/day
Mountain Bike	10-50 miles of single track with a variety of conditions and challenges. (Average used = 20 miles).
Horse	12-20 miles with a variety of terrain and vegetation. (Average used = 15 miles)
Hiker	4-10 miles depending on difficulty level, leisure or overnight hike. Low elevation spring/fall access is desired. (Average used = 8 miles)
Barrier-free	.5 - 5 miles, with gentle side slopes, access to view points and other points of interest. Firm trailhead is required. (Average used = 1.5 miles)
Interpretive	Usually less than 1 mile and no more than 10 - 15 stops. One-half to one hour visit maximum. (Average used = 1 mile).
Snowmobile	30-100 mile loops with off-trail play areas. Access to group facilities such as warming shelters and picnic sites. (Average used=50 miles)
Cross-country ski	6-10 miles depending on trail difficulty and skill. Need reliable snow conditions preferably over 5,000 feet. Access to warming shelters. (Average used = 8 miles).

APPENDIX C

TRAIL MANAGEMENT OBJECTIVES
OCHOCO NATIONAL FOREST

3/22/93
Date_____
District_____ *Addition___ *Update Obj.___
*Deletion___

1. Trail No 2.Trail Name 2a.Other name 3.Length (To nearest tenth of a mile)
Wilderness _____Existing ____Planned
nonwilder. ____Exist. ____ Planned

4.Termini

5.Elevation
highest _____ lowest _____
range _____

6. Section:____ T_____R_____
Latitude: Degrees: Min: Sec:
Longitude Degrees: Min: Sec:

7. Season of use
Winter____ Summer____ All year____

8.Difficulty Level ___Easiest ___More difficult ___Most Difficult
Accessiblity level ___level 4 ____level 3 ____level 2 ____level 1

9.Tread Surface

Existing	Planned
___Surfaced	___Surfaced
___Paved	___Paved
___Native	___Native

10.Rights-Of-Way
___Adequate
___Rights Needed

11.Loop trail ____yes ____no

12.ROS %
_____Primitive
_____Semi-Primitive Non-Motorized
_____Semi-Primitive Motorized
_____Roaded Modified
_____Roaded Natural
_____Rural

13.Nationally Designated Trail
___National Recreation Trail
___National Scenic Trail
___National Historic Trail
___National Side/Connector Trail
(as identified in PCT plan)
___Not Applicable

14.Maintenance Level
_____ standard
_____ less than standard
_____ date last maintain.

15.Maintenance Schedule
___Annual
___2x or more annually
___Bi-Annual
Every_____Year

16. Estimated Use
_____Act. Occasion Summer
_____Act. Occasion Winter

17.Accessibility Information
running slope (average) _____
maximum sustained grade _____
cross slope _____ tread width _____ clearing width_____
clearing heigth _____ rest stops _____ surface texture_____
edges _____ gates _____ tactile warnings_____

18.Objectives (Number in order)
__Hiker __Encourage __Accept __Discourage __Eliminate
__Pack & Saddle __Encourage __Accept __Discourage __Eliminate
__ATV __Encourage __Accept __Discourage __Eliminate
__Mountain Bike __Encourage __Accept __Discourage __Eliminate
__Motorbike __Encourage __Accept __Discourage __Eliminate
__Snowmobile __Encourage __Accept __Discourage __Eliminate
__X-Country Ski __Encourage __Accept __Discourage __Eliminate
__Interpretive __Encourage __Accept __Discourage __Eliminate
__Other_____ __Encourage __Accept __Discourage __Eliminate

19.Forest Plan Land allocation:

20.Trailhead Access

21.Planned attributes

length:_____
construction miles_____
reconstruct. miles_____
plan mgt objective_____
tread surface _____
clearing width_____
difficulty level_____
grade (max.%)_____

estimated cost _____
comments:

22.CIP planning phase

___ not submitted
___ feasability
___ NEPA completed
___ recon completed
___ survey completed
___ design completed
___ contract prepared

23. Narrative: (Describe Key Attributes, Key Experinces, History, and any Objectives not already covered or other items pertinent to the trail.)

HISTORICAL SIGNIFICANCE:

VISTAS:

NATURAL SETTING:

ISOLATION:

PRIMARY EXPERIENCE:

CURRENT USE:

USE POTENTIAL:

ACCESSIBILITY:

SPECIAL PLACES:

MANAGEMENT STRATEGY:

_____ _____
Prepared by date Forest Trail Coordinator date

_____ _____
District Resource Assist. date Forest Rec Officer date

_____
District Ranger date

APPENDIX D

APPENDIX D
TRAIL MONITORING PLAN

At the Programmatic level, minimum trail monitoring will include an annual report of the following:

* miles of new trail construction by user type
* miles of trail reconstruction by user type
* miles of trail maintenance by trail/user type
* miles of total trail that meet meaningful measure standards

At the site specific project level, trail monitoring should include some of the following information. For existing trails with moderate to heavy use these recommended monitoring guidelines can be implemented immediately.

SOILS

1. Observe soil erosion directly. Monitor the trailbed during storms. Observe how the waterbars are routing water and how long water remains on the trail. Take corrective action where needed by adding or redesigning waterbars.

2. Monitor soil displacement at selected trail sites. Establish long term photo points to monitor changes in soil depth and compaction.

3. In areas where OHV and horse use occur off-designated routes, monitor soil compaction, channeling and erosion. Determine whether the use is causing resource damage, and if so, close the area and begin rehabilitation.

RIPARIAN- PACFISH/INFISH

1. Watershed, wildlife, and resource specialists should verify that all wetlands requiring protection have been identified at either the Forest Planning or project specific level.

2. Identify areas or trails where OHV use could degrade water quality.

3. Establish baseline water quality data for normal conditions as a basis from which to measure change. Identify water quality standards and the amount of change acceptable.

4. Establish monitoring methods and frequency. Watershed and Recreation specialists will evaluate selected OHV use areas to measure the effectiveness of site-specific Best Management Practices for OHV use.

WILDLIFE

1. Develop wildlife monitoring plans at the site specific level for trails and areas where effects to wildlife are a concern.

VEGETATION

1. Monitor for noxious weed populations. Trails will be planned to deter traffic away from noxious weed populations to avoid any spread of noxious weeds from seeds embedded in OHV tires, hoof or foot action.

2. Survey user created trails for damage to sensitive plants and habitat, and for spread of noxious weeds. May be done several times a year to coincide with flowering of certain species. If damage is found, action needs to be taken to deter off-trail use in these areas. It is important to determine the source of disturbance- OHV, human or livestock.

3. Assess effects on TES species identified along trails. Monitor yearly for disturbance, type, population size, population viability, and invasion of non-desired vegetation.

HERITAGE RESOURCES

1. If a trail or off-designated route use area is near a heritage site - mitigate by fencing, burying the site with a variety of materials, or completely recording or excavating the site to obtain all the information possible.

2. Monitor known sites at least monthly during high use season.

NOISE MONITORING

1. Use the Society of Automotive Engineers (SAE) Standard J1287 to monitor noise levels of OHVs. To allow for relatively easy in-use testing, the SAE developed a stationary sound test, SAE J1287, last revised in 1988. This test method has been widely adopted by authorities responsible for managing off-highway vehicle recreation. A number of National Forests are also currently using this method to regulate motorcycle noise under the authority of 36 CFR 261.13(d). Its use is promoted by the Motorcycle Industry Council. SAE J1287 measures exhaust noise 20 inches from the muffler outlet while the motorcycle is stationary and the engine is operated at a specified steady engine speed. The method was intended to be quick, easily run, easily understood and to be able to identify excessively loud motorcycles. The reference to use is: Makel, William J. and Robin T. Harrison., Correlation of Off-highway Motorcycle Sound Test Methods, Oct. 1993, USDA Technology and Development Center and Motorcycle Industry Council Inc., San Dimas, CA. OE11A40 Noise Control in Forest Recreation. A copy of this publication is in the Analysis File.

RECREATION TRAIL USE

1. Record the following on an annual basis: miles of new trail built by user type; miles of trail reconstructed by user type; miles of trail maintained by user type; miles of existing trail that meet meaningful measure standards.

2. Develop a trail recreation use count plan using the publication "Techniques and Equipment for Gathering Visitor Use Data on Recreation Sites". Use the RECUSE computer program to develop a sampling schedule. Use of each individual trail should be recorded at least every 5 years. Trails with user conflicts or resource damage should have use monitored yearly until problems are corrected.

APPENDIX E

APPENDIX E
TRAIL EDUCATION & ENFORCEMENT PLAN

Trail Use Education Objectives:

1. To increase visitor awareness and understanding of the National Forest system and recreation opportunities available.

2. To teach the visitor minimum impact behaviors through use of the Right Rider, Leave No Trace, and Tread Lightly programs.

3. To teach a general land ethic responsibility towards public lands.

4. To make a special effort to reach young people whose minds are receptive to new ideas.

5. To create support and understanding of the Forest recreation trail program.

6. To establish positive working partnerships between the Forest Service and the public.

Trail User Education will occur in four main areas and use a multi-staged approach which begins with least impact to visits and increases FS presence and law enforcement if monitoring shows a need. The four main areas of education include: In-Town education, Front Desk education, trailhead education, and field education. There are three phases outlined for field education. Phase I uses signing and maps to teach trail and land use ethics. Phase II emphasizes visitor contacts and Phase III uses law enforcement and citations to achieve compliance.

IN-TOWN EDUCATION

The Ochoco National Forest and Crooked River National Grassland employ both a Tread Lightly Master Performer and an OHV Specialist. The Master Performer will continue to present yearly programs to young children and teenagers on proper use of OHVs and minimum impact riding techniques. The OHV specialist will assist with this effort. In addition, Wilderness managers in the Supervisors Office and District Offices will continue to present Wilderness Minimum Impact camping and trail hiking techniques to school children.

The Forest OHV Specialist will share information and education at local events such as County Fairs and at local stores.

The Public Affairs officer will assist with preparation of trail articles for local papers. This will include informing the public of new trails open for various uses and the condition of existing trails.

FRONT DESK EDUCATION

The Recreation Opportunity Guide will be updated annually for use at Information Desks. The guide lists existing trails, the allowed trail uses, trail difficulty levels, and any pertinent information visitors need to know for an enjoyable trip.

Easily understood maps will be available at all FS offices. Travel maps will clearly show where each type of trail use is or is not allowed. Areas open to off-designated route travel and seasonal restrictions by use type will be clearly shown on maps.

TRAILHEAD EDUCATION

Trailheads will be well marked both on Forest maps and on the ground. Each major trailhead will have a bulletin board. The bulletin board will contain as a minimum: a map of the area with trails clearly shown, special trail conditions, types of uses allowed and not allowed on each trail, and clear trail directional signs.

The trails themselves will be clearly marked. At the beginning of each trail, a sign showing the types of uses allowed and not allowed will be posted.

FIELD EDUCATION

Begin with least impact to visitors and increase level of FS presence and enforcement if education alone does not work.

Phase I: Signing

Effective, easily understood signing is the first level of approach. All trailheads will be well signed, showing a map of the area, uses permitted, uses not permitted and any visitor precautions.

Signing on the ground will match travel restrictions on the maps.

Emphasize noxious weed education. The spread of noxious weeds by wheels, hooves and boots is a major concern. Signs, pictures, and suggestions for action to assist in stopping the spread of noxious weeds will be posted at all trailheads and staging areas. Signs at dispersed campsites and hub areas should also be considered.

Signing concerning trail etiquette will be present. Use official Forest Service signs. The main messages on trails will be:

** Share the trail. Always yield to the right.

** Respect private property and road closures.

** Leave wildlife alone. This is their home.

** If you pack it in, pack it out. Pick up other people's litter.

** Do not ride in meadows or scablands- stay on the trail.

** Stay at least 100 feet away from lakes or streams except on designated routes.

** When fording streams use the designated ford, do not trample the vegetation looking for an easier ford.

** Do not disturb cultural artifacts or archeological sites.

** Remove trail obstacles instead of skirting them.

** Bicyclists: Slow down and alert others as you approach.

** Trail courtesy and safety are the visitors responsibility.

** Bicyclists and OHVs should ride only on open trails and control their bikes. They should always yield the trail, never spook animals, leave no trace, and plan ahead.

** Equestrians and OHV riders should always control their horse or machine, and avoid cross-country riding.

** Hikers should yield the trail to equestrians and OHVs.

** No trail user should ever cut a switchback.

** All trail users should avoid muddy areas except on trails. On wet trail areas they should still use the trail rather than create a new trail next to the existing one.

** OHVs must comply with State and local laws. Spark arrestors must meet specifications. Noise levels must meet State standards.

Phase III: Forest Service Visitor Contacts

A FS presence will be in the field contacting visitors during heavily used periods, as well as during critical resources seasons. Critical resource seasons include times of extremely wet, erosive soil conditions; hunting closures; fawning/calving seasons; nesting seasons, etc.

The primary purpose of visitor contact is good host presence. Explain rules and why. Reinforce the trail use messages given in Phase II. Check OHV equipment for sound levels and State law compliance with licenses, spark arrestors, etc.

When making public contacts have information packets to share with visitors. The packet should contain a travel map and Tread Lightly information.

Work closely with trail user groups. Encourage self enforcement and peer pressure from user groups to gain compliance with trail etiquette and rules. Work with the State A.T.V. Allocation Committee and the State SnoPark Committee to expand motorized trail opportunities through partnerships. Work with Oregon Equestrian Trails to manage horse use and group events on the Forest and

Grassland. Develop contacts with non-motorized user groups such as the Central Oregon Nordic Club and the local mountain bike groups. Use these contacts to develop partnerships for trail maintenance.

Phase II: Issuance of Notice of Violations

As a last resort, visitors not complying with clearly signed closures, rules and regulations should be issued a Notice of Violation.

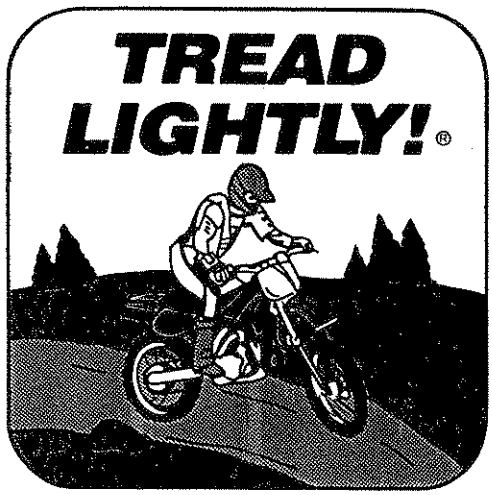
The following Executive Order 11644 explains the role of enforcement in trail management, especially OHV management:

Sect 6: Enforcement: the respective agency head shall, where authorized by law, prescribe appropriate penalities for violation of regulations adopted pursuant to this order, and shall establish procedures for the enforcement of those regulations. To the extent permitted by law, he may enter into agreements with State or loacl governmental agencies for cooperative enforcement of laws and regulations relating to off-road vehicle use.

Sect 9: Special Protection of Public Lands: (a) Notwithstanding the provisions of Sect 3 of this Order, the respective agency head shall, whenever he determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trail of the public lands, immediately close such areas or trails to the type of off-road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

(b) each respective agency head is authorized to adopt the policy that portions of the public lands within his jurisdiction shall be closed to use by off-road vehicles except those areas or trails which are suitable and specifically designated as open to such use pursuant to Section 3 of this Order.

APPENDIX F



APPENDIX F

TRAIL LOCATIONS & DESIGN GUIDELINES

Major objectives when planning recreation trail opportunities include protection of natural resources; compliance with National laws; and providing quality, affordable recreation trail experiences. The key to an excellent trail system is quality trails, adequate mileage, and competent design. A successful trail will satisfy the intended user, protect the environment, and be developed and managed in a cost effective manner. These trail location and design guidelines are intended to assist in project specific trail planning.

I. GENERAL CONSIDERATIONS

Protection of Natural Resources & Complying with National Laws

All site specific trail projects will follow National Environmental Policy Regulations (NEPA) and Executive Order 11644 as amended by Executive Order 11989. During site specific project analysis existing resources will be inventoried and their condition noted. As new trails are developed, each environmental analysis must look at the system as a whole and define how the project fits into an area-wide trail system. The analysis must:

Define objectives and the intended recreation experience.

Define issues and management situations for specific trails in the system.

Evaluate current conditions and projected changes and trends, public issues, and management concerns.

Identify recreation and resource management opportunities enhanced by trails.

Executive Order 11644 as amended by EO 11989 provides the following guidelines for location of ORV areas and trails. While not specifically mentioned, these same principles would apply to all non-motorized trails.

ORV areas and trails should be located so as to minimize:

* damage to soil, watershed, vegetation, and other resources of the public's land

* areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats;

* areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.

Sect 5: Public information: The respective agency head shall ensure that areas and trails where off-road vehicle use is permitted are well marked

and shall provide for the publication and distribution of information, including maps, describing such areas and trails and explaining the conditions on vehicle use.

Sect 9: (EO 11989 amendment, 1977) Special Protection of the Public Lands: (a) ...the agency head shall, whenever he determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trail of the public lands, immediately close such areas or trails to the type of off-road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

(b) Each respective agency head is authorized to adopt the policy that portions of the public lands within his jurisdiction shall be closed to use by off-road vehicles except those areas or trails which are suitable and specifically designated as open to such use pursuant to Section 3 of this Order.

Providing Quality Recreation Trail Experiences

All trail development and layout will follow Forest Service direction in the Forest Service Trail Management Handbook 2309.12. When considering trail plans, analyze them in the context of logical land units rather than a single trail by itself. Establish trail management objectives (TMOs- see Appendix C) and requirements by examining the interaction of resource activities, opportunities present, and constraints of the area.

Use the Recreation Opportunity Spectrum (ROS) to help ensure that a suitable diversity of outdoor recreation opportunities are provided as a part of the natural resource benefits of National Forest Lands. The location, design, and use of trails play a critical role in determining whether the physical, social, and managerial settings of a given ROS class can be maintained as intended in the prescription. The configuration, quality, sequencing of environmental settings, and the landscape attractions are the basic attributes of a trail setting and user experience.

Social Setting

Two conditions usually apply to trail management as it relates to the social setting of a given ROS class: (1) the type of use- specifically the mode of travel and mix of user groups, and (2) the volume of use- the number and frequency of encounters between user groups and the impact of the amount of use on the adjacent physical setting.

Design trailhead capacities and trail structures to help achieve the intended recreation volume within the management area and to minimize potential user conflicts.

Physical Setting

Consider the following aspects of the physical setting of trails in each ROS class:

The location and design of the trail prism and associated structures, including trailhead facilities.

The management of the visual resource provided by the characteristic landscape through which the trail passes.

The visual impact of the trail as it is viewed by others from locations away from the trail.

In addition, during trail planning, extensive sensitive species surveys should be completed, covering the entire affected area, not just the trail and influence zone.

Managerial Setting

Three considerations generally apply to trail management regarding the managerial setting of a given ROS class:

1. The management of trail activities and use. The management of trail users and the various activities users engage in include the use of formal regulations, signs, and physical barriers.

2. The stewardship of the trail facility. The impression of management concern for the trail facility is reflected by the quality of construction and maintenance given to the trail and related structures. Good stewardship on the part of management usually promotes good stewardship on the part of the trail users. Emphasis on partnerships and adopt-a-trail programs help build public ownership of trails and stretch reduced federal budgets. Trails with committed partners should be emphasized.

3. Compatibility of other resource management activities with the intended use of the trail system. The intent of the management prescription for a given area is to integrate resource management activities so as to minimize potential conflicts. The timing of resource management activities to avoid predictable periods of use or seasonal restrictions on trail use can mitigate conflict.

II. Site Specific Trail Planning Guidelines

Many factors contribute to a well designed trail which incorporates variety, challenge, and scenic features. In addition, the cumulative experiences offered throughout the Forest and Grassland trail system should be considered. Ensure a broad range of trail experiences- motorized and non-motorized, summer and winter opportunities. Provide for high elevation summer trails as well as low elevation winter trails below the snow zone. Provide for sufficient distance between motorized and non-motorized trails to allow non-motorized users a true sense of quiet and solitude away from the mechanical sounds of man.

Each trail will have an approved Trail Management Objective (TMO) prior to construction and/or maintenance. The TMOs will identify trail maintenance to meet Meaningful Measures Key Standards, once these standards are developed nationally. Trails will be identified for one of 5 maintenance

levels. Trails that meet all Key Measures for maintenance will be considered maintained "TO STANDARD". Maintenance on these trails is adequate to permit the trail to serve its established objectives. Trail maintained to "LESS-THAN-STANDARD" do not fully serve their established objectives and do not meet at least one of the Key Measures.

TMOs will include identification of the intended primary, secondary, and other trail users. Trail users not allowed will also be specified. When OHVs are the intended trail user, the specific Class of OHV use allowed during each season must be specified. Frequency of trail maintenance and maintenance level will also be specified. The required TMO form is shown in Appendix C.

Provide for an integrated trail system designed to meet user expectations. The trail network must be interesting and provide for both short trails for families and users who want an experience centered around one area and longer trails for those wishing to travel a greater distance.

For OHV trails especially, the trails must be challenging and designed to encourage users to remain on the designated trails. Warm-up trails (1/2 mile) should be provided in conjunction with the staging areas.

Trail Analysis

During the site specific trail planning process the following questions will serve as guidelines to ensure that goals and objectives are met giving full consideration to natural resource protection and development of a quality trail experience:

1. Is there an approved plan for the area?

2. What are the general goals of the Forest Plan as they relate to the area?

3. What specific Forest Plan management objectives and prescriptions have been designated for the area? What other resource activities are likely to take place? What recreation opportunities is the area intended to provide? What trails and setting attributes are important or critical for these opportunities? How are existing trails in the area used, by how many and what type of user?

4. Within those prescriptions, what standards and guidelines might affect trail system design, operation, and administration?

5. Does a suitable location exist in the area to provide the proposed activity and recreation experience? Can a variety of trail experiences be offered? What difficulty level does the trail system offer? What is the ROS class in the area?

6. What transportation and recreation facilities exist in the area? Does conflict occur among travel modes? What is the current relationship between trails and other facilities, such as roads, trailheads and campgrounds?

7. Does an opportunity exist for providing supplementary facilities such as trailhead parking, corrals, shelters, water and sanitation facilities, major stream crossings, registration/ information, and education facilities, road and trail signs?

8. Can existing little used or deteriorated facilities be renovated to offer the planned activity in lieu of new construction?

9. Can overuse and misuse of an existing facility be mitigated or eliminated by relocation, rehabilitation, or development of a new facility?

10. What is the relationship of the trail system and its uses to private lands?

11. What public issues (such as concerns about trespass, littering, parking, and traffic congestion) have arisen regarding the trails?

12. Are additional capabilities needed to enforce regulations and restrictions?

13. What are the long-range impacts of system operation and maintenance? Are resources (such as funds, personnel, volunteers, partners, and equipment) available for development and maintenance?

III. Trail Construction Guidelines

The following trail construction guidelines have been gleaned from a variety of trail management handbooks, papers, and books. There are many suggestions that can help mitigate resource impacts such as waterbar construction that works for motorcycle trails, stream crossings, etc. Forest Service construction specifications, engineering expertise, and these suggestions should all be considered during trail design, construction, and reconstruction. Monitoring will allow selection of the most effective techniques for each site specific situation.

OHV trail design guides for trailbed preservation, reduction of erosion:

* Keep dirtbikes light on their wheels through trail design. Use dips, mobiles (moguls), and superelevation in trail construction design. A mobile is a big, round, soft-peaked waterbar- rollers, moguls, etc. It serves three purposes: OHV speed reduction; drainage; and interruption of the process that starts the grooving in the first place (biting back tires).

* Keep trail speeds to 12-20 miles per hour through trail layout and design. Design in twisty, challenging trails by putting some action into the trail. Keep straight sections to a minimum. Vary the turns in distance, contour, banking, circumference and apex. Use physical obstacles such as old logs, hay bales, or slash, to keep riders in the turns.

* Use many erosion control devices (as much as one every 125 feet). Drainage helps to prevent a "below grade" trail bed and drainage helps put the soil where it can be reclaimed. Use waterbars and dips to steer the water into small siltponds constructed within 20 feet of the trail. Each fall, winterize the trails by moving the soil that has accumulated in the siltpond back up to the trail, using it to rebuild waterbars or dips.

* Place the waterbars in a straight section of trail long enough so the OHV operator can see a clear trail well beyond the waterbar, about 30 feet. This allows the operator to keep the throttle on, causing the bike to float instead of bite and move soil.

* Do not design trails to take a straight line up the grade, but make a series of turns. The steepest terrain may require a series of turns of 35-55 degrees with up to 40 feet apex to apex.

* When crossing Class 2 and 3 streams, prevent soil erosion by placing large mobiles on each side of the gully. Make sure the soil is well compacted and not too close to the stream.

* On slopes greater than 15% the uphill side should be constructed below grade with a drain attached. The downhill side remains above or at grade level.

* Triangular shaped depressions also work well as drainage structures. The long side of the triangle should be on the highest side of the trailbed and up to 25 feet long. The tip of the triangle points to the drain.

* To keep trails from becoming a stream during storm events:
  - Superelevation (banking) of 30 degrees in a turn or no gully present in the trailbed. The outside of the turn is on higher grade than inside by 2-6 feet.

  - Route the water by dipping the trailbed (12" minimum) below grade. The dip should have soft angles and end above grade (make a bump right after the dip). Outslope the valley of the dip toward the drain. The bump should route the water as close to 90 degrees across the trail as possible.

  - Drain runoff into a siltpond whenever possible.

<u>Treatment of Riparian Habitat Conservation Areas:</u>

Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of Riparian Management Objectives and avoids adverse effects on listed anadromous and/or inland fish. Complete watershed analysis prior to construction of new facilities in RHCAs within priority watersheds. For existing facilities inside RHCAs, assure that the facilities or use of facilities will not prevent attainment of RMOs or adversely affect listed anadromous and/or inland fish. Relocate or close facilities where RMOs cannot be met or adverse

effects avoided.

Trees may be felled in RHCAs when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives.

Prohibit storage of fuels and other toxicants within RHCAs. Prohibit refueling unless there are no alternatives. Refueling sites within an RHCA must be approved by the FS and have an approved spill containment plan.

Minimize trail locations in RHCAs. Regulate traffic during wet periods to minimize erosion and sediment delivery.

Route trail drainage away from potentially unstable stream channels, fills, and hillslopes.

Provide and maintain fish passage at all crossings of existing and potential fish-bearing streams.

Other trail design tips:

The single most important aspect of inventory is to identify and locate features that enhance the trail experience.

Support facilities: all trails should have trailheads, bulletin boards and signs as a minimum. Support facilities for horses and OHVs should be developed in central locations adjacent to major trail systems. Emphasize minimal developments that protect resources and provide for public health and safety.

Route trails to avoid sensitive areas. Avoid locating trails in meadows. Mitigate if area cannot be avoided. Use state of the art engineering skills to design and built trails.

Protection and rehabilitation of newly damaged areas should begin upon discovery. Rehabilitation of older damaged areas should occur concurrently with construction of new trail opportunities.

A Forest Service presence in an area and appropriate law enforcement is essential. This is especially important when initiating a change in use patterns. Forest Officers charged with administering the programs must be knowledgeable and proficient in the use of OHVs or the intended trail use and use the appropriate travel mode when contacting visitors.

Cooperation and support from user groups is an essential element in helping to manage trail use. Enlist the assistance of users in the operation and maintenance of trails through volunteer programs. Establish volunteer Host patrols and use entry stations and bulletin boards at staging areas to provide information.

Avoid excessive trail grade. Use switch backs with correct curve radius for intended users.

When designing trail systems construct a system of loops. The inside loops

should be short and easy. As the rider gets further from the trailhead, the trail may become increasingly more challenging. Signing at junctions is critical.

When planning a trail, determine its design capacity. This is generally an expression of the maximum number of recreationists that may use a given length of trail (one mile) in a given period of time (usually one day) and still meet user expectations for a particular type of trail experience.

Well placed, easy to read signing is essential for any trail network. All junctions should be signed. Keep signs well maintained and avoid sign pollution. When closing trails, use effective signing as well as camouflage the entrance to the trail.

Use cattleguards at all fence crossings on OHV, horse and mountain bike trails where feasible.

Trail rehabilitation should be emphasized over new trail construction. Areas of resource damage must be corrected immediately or the trail closed until the damage is corrected.

Use of Level 2 and/or closed roads for trails

When considering use of closed roads as trails, ensure that the intended trail use is compatible with the reason the road was originally closed. For example, roads closed to reduce harassment of wildlife during fawning season may need to remain closed to all uses for specific periods of time.

OHV use of Level 2 maintenance roads is permitted if the road is open. OHV use of closed Level 2 roads is not permitted unless specifically signed.

References for Trail Design and Construction:

Joe Wernex, 1994. Off-Highway Motorcycle & ATV Trails Guidelines for Design, Construction, Maintenance and User Satisfaction. 2nd Edition. American Motorcyclist Association. PO Box 6114, Westerville, Ohio 43081.

USDA Forest Service. 1988. A Development Plan For The Murdock Basin ATV Trail System. Intermountain Region, USDA Forest Service. Ogden, UT.

Makel, William J., 1988. All Terrain Vehicles and Trailbikes in the Forest. A Management Approach. Clemson Class of 1987, Clemon University, SC.

USDA Forest Service. 1994. Trails Management Handbook, FSH 2309.18.

USDA Forest Service. 1984. Standard Specifications for Construction of Trails. Engineering Staff, Washington D.C. EM-7710-102.

McCoy, Michael and MaryAlice Stoner. 1990. Mountain Bike Trails: Techniques for Design, Construction, and Maintenance. published by BikeCentennial, P.O. Box 8308, Missoula, MT. 59807.

APPENDIX G

APPENDIX G
RESPONSE TO PUBLIC COMMENTS ON DEIS

Fifty-eight public comments were received during the 45 day comment period on the DEIS from August to October 23, 1995. Of these, two agencies responded with no comments/ concerns; forty-four letters were from members of the Central Oregon Motorcycle Association; three letters were from environmental groups (Central OR Forest Issues Committee, Eastside Conservation Ontology, and OR Natural Desert Association); four letters were from other off-highway vehicle groups (Blue Ribbon Coalition, OR State Snowmobile Association, and Ochoco Snow Sports); one letter from the Burns Piaute Tribe; one letter from OR Department of Fish & Wildlife; one letter from Pacific Gas Transmission Co. (PGT); one letter from the Dept. of Commerce; and a summary of comments from the Bureau of Land Management.

COMMENTS BY ISSUES

1. GENERAL COMMENTS ON ALTERNATIVES

Prefers Alternatives E and F because they are consistent with BLM desired direction on land use trends; would result in less damage to other resources; because of ease of implementation and public understanding; these alternatives are more resource-wise to prevent the problem before it begins.

RESPONSE: The Forest Service will continue to work with BLM and Deschutes National Forest to ensure consistent trail management objectives. At this time Millican Valley is open to OHV use both on and off trail. Fort Rock OHV area is open to OHV use on designated routes only, while the rest of Deschutes National Forest is open to OHV use on and off designated routes unless otherwise posted. Alternatives A, B, C, and D in the FEIS are consistent with these policies.

The Title of the DEIS is Trail System AND OHV Management and Development, not just OHV Management. Therefore, the range of alternatives should include a range for non-motorized and winter trail users also. More attention should be paid to non-OHV Forest users.

How can the Forest adequately analyze a full range of alternatives without considering a no OHV alternative? When an action is existing the FS must have two fully analyzed alternatives. a) no change of action i.e. current FS plan, and b) no action i.e. cessation or removal of that action.

RESPONSE: The interdisciplinary team felt that the existing Forest Plan trail miles targeted for non-motorized trail use and winter motorized trail use fully met current and future projected demand. See page 69 of the FEIS, which shows an additional 200 miles of snowmobile trail and 126 miles of nordic ski trail would be developed in Alternatives A, C, D, E, and F. Most non-motorized summer trails on the Forest and Grassland are currently underutilized. The additional 256 miles of non-motorized trail development would fully meet current and future demand. The FEIS highlights these nonmotorized trails more clearly.

An alternative which would not allow OHV use was considered and eliminated

from further study (see page 29 of FEIS, 1st paragraph). Executive Order 11644 and further National Forest policy direction from the Chief of the Forest Service in his 12/28/94 letter state that OHV use is a legitimate use of National Forest lands. For this reason, the no OHV use alternative was not further analyzed. Restrictions on permittee use were addressed in alternative E, which allows analysis of effects, meeting NEPA guidelines. See also the Environmental Policy and Procedure Handbook Chpt 10.141 regarding Forest Plan Amendments. It states that the NO ACTION alternative means no change from the existing direction.

Should there be some differentiation between 250 miles and 500 miles of OHV trails meeting trail demand?

RESPONSE: Tables 4.3 and 4.4 (page 69 of FEIS) show that while 250 miles and 500 miles of OHV trail develop both fully meet demand, 250 miles provides 3.5 days of riding while 500 miles of trail provides 7 days of riding.

Purpose and Need additions should include information indicating that the user created system that is now in place is due to the non-management of the agency. Negative impacts to the resources should be considered the sole responsibility of the land managers since there has never been any consistent direction and management.

RESPONSE: Please see page 1, paragraphs 2 and 3 which state that conflicting and unclear management direction concerning OHV use in the analysis area is one of the major reasons for this EIS. While land managers can clarify direction, provide trails for user enjoyment, implement user education, and monitor resource impacts, the Forest Users must also share responsibility by learning the rules and riding principles.

The objectives of the proposed action lists 5 out of 6 of the objectives as negative towards OHV use. These objectives show a bias and speak to broad based assumptions stating OHV use must be in conflict with all resources.

RESPONSE: See page 6 of the FEIS. The six objectives listed do not mention specific trail users and were intended to apply to both non-motorized and motorized users.

The Forest needs to conduct suitability studies to identify sites where OHV use can be accommodated, not simply identify areas that will be closed. Much of the upland areas with fragile soils, as well as small springs, seeps, bogs, and wet meadows that have not been identified in MA-F15 in the LRMP need to be protected.

RESPONSE: Since this is a programmatic document, the analysis for the proposed action is broad based. When the specific trails are proposed, another environmental analysis will be completed, addressing Riparian Management Objectives, giving a broader definition to "riparian".

SOCIAL ISSUES

Wants FS to work to encourage riders to stay on proposed trails.

RESPONSE: Page 3 of the FEIS states one of the objectives of the Trail Management Plan is to "Increase the use of visitor education tools....and signing". Page 16 of the FEIS states that one of the proposed actions common to all alternatives is "Provide information to all trail users at trailheads and other locations concerning use restrictions and appropriate user behavior. Emphasize TREAD LIGHTLY programs to education users". In addition, Appendix E of this FEIS contains a detailed user education and monitoring program.

Alternative D is more confusing and harder to enforce; as use increases resource damage could reach unacceptable level; "open" lands lead to trash dumping, illegal firewood cutting, and resource damage.

RESPONSE: Alternative D is less open to OHV off-trail use than the existing situation (Alt B). See page 70, Table 4.5 of the FEIS for % of each alternative open to off-designated route motorized uses. Sensitive areas closed in the LRMP within General Forest Areas would remain closed under all alternatives.

Should consider providing riding opportunities in higher country from early summer to late fall, too hot and dry in desert.

RESPONSE: Appendix F of this FEIS provides guidelines to use when considering specific locations for non-motorized and motorized trail location. Providing a variety of trail opportunities through all seasons is emphasized.

The DEIS states "However, these actions alone will not resolve the long-standing conflict between motorized and nonmotorized trail users" (page 8). Of course you are required to resolve these conflicts under EOs. What will you do to resolve the conflicts as required under Executive Orders and CFRs? Isn't the EIS and alternatives supposed to do this?

RESPONSE: As land managers the Forest Service can assist in conflict resolution, however, we cannot change people's attitudes, especially attitudes and values that are deeply held. Page 8 of the FEIS explains that user conflict would be addressed through user education and trail etiquette, improved signing standards and information distribution, increased monitoring of trail use, trail conditions, and conflicts, enforcement of noise regulations and an emphasis on partnerships and volunteers to provide more trail opportunities. Executive Order 11644 Section 3 (3) states: "Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposedrecreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors."

There is no quality Nordic ski area in the Ochoco NF. Snowmobile and ORV use destroys ski tracks. Snowmobile fumes have created unsafe air conditions, especially for Nordic skiers that are exerting themselves, and breathing heavily at high altitudes. Where do you propose to put additional miles of

trails without designating additional non-motorized winter use areas? Why do you think there are no thriving ski and mt. bike rental shops in Prineville?

RESPONSE: The snow level and quantity of snow in the analysis area is very unreliable, especially below the 5,000 foot level. While beyond the scope of this programmatic document, the Forest is working on development of a high elevation SnoPark, which would expand both non-motorized and motorized winter use. At this site specific level, separation of skiers and snowmobilers will be discussed in the NEPA document. In regards to economic benefits of recreation to the local community, there are many. However, there are no specific economic studies for Prineville, therefore we can only infer from previous studies. These studies show that the closer large populations are to outdoor recreation facilities the more they get used. Bend, with its larger population and more reliable snow, can support more ski and bike shops.

Knowing there is marginal snowmobiling at the lower elevations, cross country riding is usually necessary, rather than always on designated routes to get to other areas. The designated routes are not always accessible due to the lack of snow. We feel 5.5 days for snowmobilers and 24.5 days for cross-country skiers are not an equal division. Wouldn't trail requirements of all users be the goal of the DEIS?

RESPONSE: Snowmobilers are not limited to designated routes in any alternatives. The Forest Service is striving to provide adequate trail opportunities for all user groups. An attempt to balance the number of days of trail opportunity with the miles of trail needed was considered during this analysis. This has been clarified in the FEIS, Appendix B better explains the decision making process.

The cumulative effects are not analyzed and yet on page 68 you say the effects of expanded use will be negligible. How can you say this?

RESPONSE: Cumulative effects are analyzed in Chapter 4 of the DEIS. For example pages 73-4, 80, 89, 94, and 102 of the FEIS discuss cumulative effects of the proposed actions. Some of the cumulative effects have been expanded in the FEIS to incorporate more recent scientific studies.

Page 4 states "Opportunities for off-designated route use will be provided where they are in harmony with resource and area management objectives" What does this mean? Where are the areas? How do you determine if OHV use is in harmony? This is so vague as to be non-enforceable. If the public thinks that use is not in harmony do we have to rely on you to comfort us and tell us that it is.

RESPONSE: Harmony, according to Webster's Dictionary is:"a pleasing combination of elements forming a whole; the state of individuals who are in total agreement". Since we realize there will never be total agreement regarding trail use, especially OHV use, the word "harmony" has been changed in the Desired Future Condition statement and replaced with "in balance with". This means resource and area management objectives such as protection of fish, wildlife, soils, and vegetation would be met. To determine if OHV use is in balance with other objectives a site specific environmental analysis would be conducted.

We see this (document) as a OHV user only plan that fails to prevent resource damage, user conflict, wildlife disturbance etc. What is most disturbing is that in this document you identify negative effects across the board associated with OHV use and yet have nothing about enforcement, rehabilitation or restrictions.

RESPONSE: Three Appendices have been added to the FEIS to address these concerns: Monitoring Guidelines; Trail Location & Design Guidelines; and an Education and Enforcement Plan.

The economics regarding trail users are woefully inadequate. What has been the cost of repairs at existing OHV facilities on other forests compared to facilities that do not allow OHVs. They are astounding. The cost of enforcing OHV use, rehabilitating the areas they destroy and replacing the forest equipment they damage, burn up or steal is prohibitive. This is not only unaddressed it isn't even alluded to as an issue.

RESPONSE: The cost of repairs on OHV forests versus non-OHV Forests is not available. The cost of enforcing OHV use on the East Fork Rock OHV area has been $37,000 to $39,200 yearly since 1994. Monitoring costs at East Fort Rock OHV area are $23,500 for 1996. Most of this funding has come from the State ATV Allocation Committee. Costs of rehabilitation of areas specifically for OHV use was not available. Destruction of equipment, burning and stealing was not addressed as an issue because there is no evidence that such acts of vandalism are attributable specifically to OHV users.

No, you are not meeting non-motorized recreation demands. There are no primitive experiences on the Ochoco NF.

RESPONSE: We agree that there are very few opportunities for primitive recreation experiences in the Analysis Area. It was not the purpose of this EIS to adjust the amount of various recreation settings in the Analysis Area. Table 3.1 of the FEIS (page 40) summarizes the available recreation opportunites by acres. The miles of trail by ROS has also been added to this table in the FEIS.

Page 7 is an out and out lie. The trails at Henderson flat received no analysis or decisions. They were built, including an unloading ramp, campsites, and toilets, with money contracted from the state ORV funds, unlawfully.

RESPONSE: Page 7 of the DEIS does not refer to any issues concerning Henderson Flat. This entire EIS process began as a response to concerns over OHV use at Henderson Flat. The facilities at Henderson Flat were built using All-Terrain Vehicle project funds from the Oregon Department of Transportation A.T.V. Account Allocation Committee. The A.T.V. Account Allocation Committe evaluated the project applications and approved the funding. A legal Supplemental ATV Agreement between the Oregon Department of Transportion and the U.S.D.A. Forest Service was written and signed by the State of Oregon, Department of Transportation, Manager of Operations Support Section and the U.S.D.A. Forest Service, Ochoco National Forest, Forest Supervisor.

Trails that were designated at Henderson Flat in 1987-8 were undesignated a year later due to an appeal on the Forest Plan. Henderson Flat is currently managed by encouraging OHVs to stay on existing paths, however the problem cannot be entirely rectified until completion of this FEIS due to agreements in the appeal. In the mean time, several areas of conflict/ and or resource damage at Henderson Flat have been closed to OHV use.

Conducting trail maintenance and condition surveys every 3 years is inadequate. I have documented an entire watershed destroyed in three days. These trails must be routinely patrolled and monitored.

RESPONSE: Fequency of trail maintenance requirements have been changed in the FEIS (see page 16). Frequency of maintenance would be decided at the site specific level and identified in the Trail Management Objectives in accordance with Forest Service Trail Management Handbook 2309.12.

The study referred to regarding a destroyed watershed was reviewed for the DEIS and FEIS. The Mill Creek watershed is 37,263 acres and the documented OHV damage in the Mill Creek watershed is approximately 30 acres or .0008% of the watershed. This figure was added into the effects analysis in Chapter 4.

In 4.14, page 68 states "providing recreation trails, especially OHV trails would result in increased use ..that may not have occurred if Alt B were implemented. Data from the East Fort Rock OHV trail system shows no appreciable increase. Region 5 OHV trail system does not support this statement of increased use. Page 81 "it is assumed that the more trails provided, the higher the motorized use. The actual amount of use in not known, however use in similar areas....." This statement is a gross misrepresentation of fact. The figures from East Fort Rock trail counters show no significant increased use.

RESPONSE: Lacking site specific information for OHV use in the Ochoco's except for Henderson Flat, the best available data has been used to predict expected use in the analysis area. Data from East Fort Rock does show an increase in use of about 10% per year except for 1995, when a hot, dry spring may have been responsible for decreased use. Current 1996 use figures show a significant increase during winter and spring of 1996. Although the exact reasons for increased use are unknown, flooding of trails in the Williamette Valley and increased word of mouth advertisement of the trail system may be responsible. Studies at Henderson Flat show an 21.9% increase in use from October 92 to May 1996.

Soil impact: 4.31c page 71- state that alt D OHV trails would directly impact 364 acres of soil. This area could be reduced by locating trails on old roads, scablands, and also non-designated trails that already exist in the Grassland/Henderson Flats area.

RESPONSE: In the Ochoco National Forest Land and Resource Management Plan and this EIS, scablands are recognized as being fragile and requiring special care. Due to the shallow soils, severe water saturation, and frost heaving, damage to scablands is virtually impossible to mitigate. The location of any type of trail across scablands would require site specific

analysis to determine any possible resource damage. Scablands should not be viewed as wastelands or sacrifice areas.

Old, closed roads cannot be automatically viewed as areas available for use as trails. Roads are closed to meet resource management objectives such as reduction of wildlife harassment. Re-opening closed roads will also require site specific analysis to determine if re-opening the road will result in resource damage. Appendix F, Trail Location & Design Guidelines will assist managers in deciding when use of old, closed roads is or is not appropriate for trail location.

A well designed trail system should include a variety of trails that will challenge most users. As long as trail users feel the trail is entertaining, there will be less tendency to create unapproved trails. It is important that the FS consult with the ultimate trail users to be sure the trail system has the correct mix of terrain and miles.

RESPONSE: The Trail Location & Design Guide, Appendix F of this FEIS are a compilation of state of the art trail system design. Past scoping efforts have asked local users where they would like different types of trails. The result has been a spaghetti map of trail ideas, each one different from the next depending on the individual asked. Trail location will be guided by Forest Plan objectives, FS trail design standards, and Appendix F, Trail Location and Design Guidelines.

Please discuss snowmobiling in the context of: 1. zero resource impacts since tracks disappear with snow; 2. minimal social impacts since most use occurs beyond where other recreationists can travel; 3. trails that access open snow-play areas. The DEIS fails to discuss whether or not the cited trails would be groomed, and who would provide and direct the grooming.

RESPONSE: The most recent scientific studies related to snowmobile use have been incorporated into Chapter 4, Environmental Consequences. Snowmobiles do not have a zero impact on other recreationists experiences or upon wildlife. Social impacts are not minimal except in remote areas. Grooming and location of play areas is beyond the scope of this programmatic document and will be dealt with at the site specific planning level.

In Actions Common to All Alternatives, it is not clear to us if Class I ATVS (quads and three-wheelers) are considered over the snow vehicles and permitted on all snowmobile trails when sufficient snow permits. Historically, Class I ATVs have been permitted on ONF snowmobile trails when these trails are open, and Oregon OHV funds have contributed annually to snowmobile funds for trail grooming (ORS 802.140) on the ONF.

RESPONSE: Page 16, paragraph 8 of the FEIS states:"All existing and planned Forest and Grassland Trails will have approved Trail Management Objectives (TMOs) or be closed to all uses until TMOs are completed and approved." This may or may not allow ATV use on a given trail based on the TMO.

Considering the fact that OHV use has had no management, education, trail system, maps, signage or basically no attention for the last 20+ years, the amount of affected acreage for OHV use (170 acres) is very minimal. The

agency's casual field observations can be very misleading especially considering the bias of some of the information contained in the DEIS. All OHV use, or negative impacts, should not be considered collectively when the East Fort Rock project has seen 95% of the resource damage done by hunters during a very narrow window of time, deer hunting season.

Table 4.9,two disclaimers on Table 4.9 "Area of Influence" and the "Comparison of Alternatives" note that non OHV recreations may be unduly influencing this section of the DEIS. "During hunting season this figure is higher" and "this does not apply to all forms of OHV users" are further indications that ONF needs to separate the impacts and effects of non- recreational OHVers from the true recreational OHVers. 4.33d "OHV use is heaviest during the hunting season". Non-recreational OHV users impacts need to be analyzed separately from recreational OHV riders.

RESPONSE: Results of the East Fort Rock monitoring have been incorporated into the FEIS, Environmental Consequences where appropriate. However, soil moisture is highest during the spring on the Ochoco National Forest, when most resource damage occurs, not during hunting season. The ID Team attempted to separate effects of recreation OHV riders from hunters using OHVs and found insufficient data or evidence to support separation of effects. Since resource damage still occurs from the use of the OHV, actual effects are the same. The different user groups do however, suggest a different education and enforcement strategy is needed for each group. This has been addressed in Appendix E, Education and Enforcement Plan of this document.

The users want trails not facilities and experience has shown the OHV users prefer primitive facilities with more opportunities for group camping and staging areas with direct access to trails for all ability levels. The number and size of smaller day use/trailhead facilities, possible semi-primitive campgrounds, and dispersed camping opportunities near the trail system is not clear.

RESPONSE: At the programmatic level it would be difficult to commit to a specific number and size of trailheads for both motorized and non-motorized trails. When site specific trail analysis occurs, the decisions regarding how large and how many trailheads to construct will be specified.

The greatest problem, causing us much concern and confusion, has been knowing if where we want to ride and camp is legal, and the opportunity for friends and family to learn to ride close to camp.

RESPONSE: Page 1 of the FEIS states that one of the primary reasons for this EIS is to clarify where and when motorized use is allowed on the Forest. It is still the visitors responsibility to know the rules by obtaining current maps and literature about the area they visit. When fully implemented, the Education and Enforcement Plan (Appendix E), calls for maps and literature on trail opportunities and rules of use to be available at all Ochoco National Forest offices.

Wild & Scenic designations also include recreation. A better, more comprehensive objective would be to include motorized use, where possible.

RESPONSE: The North Fork Crooked River Wild & Scenic River Management Plan allows motorized vehicle use only on designated routes from Williams Prairie to Deep Creek Campground. Motorized use on designated routes is also allowed on the Middle Deschutes and Lower Crooked Wild & Scenic Rivers on the Crooked River National Grasslands above the canyon rims.

Table 4.7 page 73. Why not have one more column- Open Acres Non-OHV?

RESPONSE: Another column for non-motorized access was added in this FEIS.

The location of trails, including the parameters needed, should be dealt with further in the trail planning process. Making broad based statement regarding the percentage of areas trail location can and cannot occur at this point seems to be placing premature limitations on the trail system and sets the forest up for an easy appeal. What if the area could sustain a larger percentage and be better overall?

RESPONSE: The ID Team revisited this issue. We concluded that a maximum of 10% of new trails (both motorized & nonmotorized) in riparian and 20% in scablands was still reasonable, allowing flexibility in trail location and design while protecting resource values.

Unnumbered page 3; "45% of analysis area is open to off-designated route use". 100% of the analysis area is open to off designated non-motorized use, why not so state? If 45% is open, but scabland and riparian requires use on designated routes; then totaling 17.4% on scabland and 12.5% on riparian, there is only 15.1% left open to off-road travel.

RESPONSE: The number of acres open to non-motorized use is the same for all alternatives, therefore, it was not addressed. The figures for scabland and riparian areas was already deducted from the open to motorized travel figure during calculation. These figures have been rechecked and found to be correct as stated.

Table 4.9, page 82 OHV open acres: Alt C shows 379,075 acres (39% of area), Alt D shows 432,401 acres (45% of area) and states 53,326 acres of scabland are open to cross-county travel while in fact Alt D is restricted to two track roads. 432,401 - 53,326 (scablands) = 379,075 acres. Need to change Alt D ranking.

RESPONSE: The amount of two track non-system roads in scablands totals the amount of acreage addressed in Table 4.9 for scablands open to cross-country travel. Scablands soils and vegetation are very sensitive. having these roads open to OHV use increases the risk of off-designated route travel, thus the ranking of alternative D would not change.

Both Alt C and D allow for travel on designated routes only; so why is 53,326 acres added to D for the extra 50 miles of designated route (20% of total all Alt 4.31d, page 72). This would be a trail 50 miles in length 8800 feet in width. Again grossly overstated numbers. Rankings should be the same for C and D.

RESPONSE: Alternatives C and D allow for off-designated route use, alternative D allows for use on two-track non-system roads in scablands,

which total more than 50 miles. The ranking for alternatives C and D area different because of the delicacy of scabland habitats and the potential for off-designated route use.

Page 82, alt D and F have the same percentage of influences, at 48%; but Alt. F has 250 miles less trail while E has a lower rating with 500 miles of trail. Why?

RESPONSE: This figure has been checked and changed in the FEIS.

Alt C,D,E,F all indicate OHV trail demand is fully met. If each district received an equal share of OHV trail miles in C and F, there would be 50 miles of OHV trail per district. This is less than one day recreation opportunity and does not meet user needs. This only provides 70% of one days use per district. If ONF only provided 10.5 miles of horse trail per district this would equal 70% of one days horse use. 5.5 miles of hiker trail or 10.25 miles of mt. bike trail. Would these numbers and totals fully meet their trail needs? (Tables 4.1, 4.2, 4.3, 4.4 page 62-64). At least one days recreation opportunity should be provided to fully meet ANY trail user needs.

RESPONSE: The Ochoco National Forest and Crooked River National Grassland are managed as one unit for at this programmatic level. It is not our intention, and never has been to provide all types of recreation opportunities equally on each district. The location of each recreation opportunity will be guided by the Forest Plan land management objectives, and guidelines set forth in Appendix F, Trail Location & Design Guidelines of this document.

Throughout the DEIS over statement of acres effected by trail construction have been used. With 25% of trails already impacted roads (page 72), 20% of trail on existing routes on scablands (page 3), leaving 55% of the 500 total proposed miles or 275 miles of trail that will be NEW construction. Table 4.6, page 73, uses a 6 ft. wide average for an OHV trail! An OHV trail will average 4.5 ft., making the number of acres 150 for OHV and 109 for non-motorized if 2 ft. wide. Is not the new non-motorized trail tread on Gray Butte wider than 2 ft? Should have checked with East Fort Rock developers for average trail width for OHVs.

RESPONSE: The guidelines set in the DEIS of up to 25% of new trails on existing roads, 20% in scablands, and 10% in riparian are guidelines only and apply to both motorized and non-motorized trails. The 6 foot wide OHV trail figure is an average width that includes Class II OHVs, and 4 wheel drive and jeep vehicles as well. Gray Butte trail tread ranges from 18" to 36" wide. Most non-motorized trails in the analysis area are 18-24". Since the East Fort Rock trail system is not designed for jeeps and 4-wheel drive vehicles, their average trail width was not used in Table 4.6.

If access to a designated trail is available from a dispersed camp site (4.13e, page 68), then the future management direction would be much better than current management. At designated camping areas a "tot lot" or kid trail must be provided. Attitude adjustment areas or playpits need to be allowed for the rider demanding a higher skill test than the trails provide.

RESPONSE: Alternatives A and B would allow this to happen. Alternatives C through F would limit OHV use to entry and exit of campsites. Individual

Ranger Districts may designate specific areas for OHV camping where they judge no impact to resources would occur (such as gravel pits).

p81. "The more trail miles the higher the motorized use" now the author uses Millican Valley and East Fort Rock as proof. The EFR OHV experts did not know the number of users that were using the 800 miles of event and user created trails before implementation of the 320 mile system. Millican Valley does not have one foot of designated trail. Millican OHV area is an open riding area. The trails in Millican Valley are all special events. Make better reference to Matt Piper's study of Millican Valley- DEIS was not an accurate summary of findings.

RESPONSE- The reference to Millican Valley has been deleted on page 81 of the FEIS. Other references to Millican Valley were changed to better reflect Piper's findings. The Millican Valley Off-Highway Vehicle area is not a designated route only area. Three of the routes mentioned on page 94, paragraph 2 of the DEIS were not within the Millican Valley OHV area. These routes were created in areas where cross-country travel is permitted.

USER CONFLICT

The Ochoco NF has never complied with any of these regulations (NEPA, Executive Orders and CFRs) regarding OHV use. Areas that were required to be closed and rehabilitated under EO's 11644 and 11989 are still open for use and are experiencing resource damage. User conflicts exist that have not been addressed and an appeal of the Forest plan regarding OHV use has not been resolved.

RESPONSE: This EIS is, in part, the agreed upon resolution to Appeal No. 90-13-00-0092, regarding OHV use in the analysis area. Another reason for completing this document is to continue implementation of Executive Order 11644. Several areas on the Forest and Grassland which have experienced resource damage as described in Executive Order 11644 have been closed to OHV use and rehabilitated. These areas include Henderson gravel pit, Mill Creek, and McKay Creek. User conflicts will continue to be addressed at the site specific level, as well as through continued employment of an OHV specialist. Additional documentation, monitoring, and rehabilitation continues to occur as needed and required under law.

There is a documented increase in crime along with an increase in ORV use. Backpackers have become targets of theft and people, especially women, have also become targets of personal attack. Poaching increases significantly in ORV use areas.

RESPONSE: We were unable to find any records or studies documenting the claims made above. Forest law enforcement records show no attacks on women related to OHV use, or specific links made between increased vandalism and OHV use in the Analysis Area.

This DEIS states user conflict as the main issue. The document also lists just seven responses received from the March scoping letter. This hardly seems to be a true conflict. Maybe a discussion of this should be undertaken.

RESPONSE: While only seven responses were received for this round of

scoping in the Trail EIS, scoping since 1987 for the Forest Plan and Travel Access planning have continually pointed to different perceptions of motorized and non-motorized uses. Previous scoping documents are available for review in the analysis file.

Non-motorized users have been unwilling to share and refuse to cooperate in planning and workshops, unwilling to work together. This group is rewarded for uncooperation, while snowmobilers are always being punished.

RESPONSE: Non-motorized users have contributed many hours of volunteer work on non-motorized trail maintenance, as have motorized users. Snowmobilers have 75 miles of marked trail in the analysis area with and additional 239 miles planned in all alternatives. Alternatives A through D allow snowmobile use off-designated routes in General Forest (except where already closed in the existing Forest Plan).

MONITORING AND ENFORCEMENT

Monitoring/Enforcement- is concerned how this plan will be implemented, monitored, and enforced, regardless of how many miles of motorized and non-motorized trails and recreation are allowed. The DEIS discusses potential lack of compliance by OHV users. We believe this is likely given the experience we have had with enforcing the Rager Cooperative Green Dot Closure, and the Forest's monitoring of the South Boundary Road Closure on Big Summit RD, and the upper Mill/McKay Road Closure on the Prineville RD. Will you increase enforcement personnel to accommodate monitoring and enforcement needs?

RESPONSE: Currently, monitoring and enforcement is done through an OHV specialist, who is funded 50% by ATV Allocation funds, and 50% federal funds. This will continue as OHV trail development occurs. Two Appendices give additional guidelines, Appendix D, Monitoring; and Appendix E, Education & Enforcement.

If new trails are built and non-compliance is observed, will the Forest close these trails to OHV use? The DEIS (p78) acknowledged that the risk of non-compliance may be greater as areas are opened for OHV use.

RESPONSE: See the Education and Enforcement Appendix E, of this document. Trails will not automatically be closed for non-compliance. First education will be used, then law enforcement. Only as a last resort would a trail be closed. Executive Order 11644 direction would be followed.

The DEIS states "Monitor trail use to determine use patterns, trends and conflict situations." Have you ever monitored? And if so what have you done as a result of this monitoring?

RESPONSE: Monitoring of non-motorized and motorized trail use occurs on an annual basis. Trails which are monitored vary from year to year. Some trail monitoring uses registration cards, others use traffic counters. Monitoring of trail condition also paints a picture of heavily used areas. In addition, the Forest OHV specialist has monitored the Henderson Flat Area since 1992. Monitoring has included photo points, trail counters, checks of spark arresters and noise emissions from Class I, II, and III

vehicles, and compliance with State registration rules. The user created trail routes at Henderson Flat have also been mapped using the Global Positioning System. As a result of monitoring we have closed the gravel pit near private land in Henderson Flat. We have also increased trail maintenance on more heavily used non-motorized trails.

Do you have an MOU from the Oregon State Patrol agreeing to enforce noise and user safety equipment? Do they have the equipment to check noise emissions? How much additional enforcement is going to be needed and how much will it cost the taxpayer? Is this decision dependant upon passing an additional tax levy? Do you have the budget for additional forest personnel to enforce compliance?

RESPONSE: The Forest Service does not have an MOU with the Oregon State Patrol agreeing to enforce noise and user safety equipment. This is currently being done by a Forest Service Off-Highway Vehicle Management Specialist. The Forest Service OHV Management Specialist does have a sound level meter for checking noise emissions and does random sound test in the Analysis Area. Local tax levies do not fund federal programs, Congress and all U.S. Citizens tax dollars do. Costs will not exceed existing cost which is $62,000., which is currently being shared 25% Forest Service, 25% Bureau of Land Management, and 50% Oregon Department of Transportation, State ATV funds. We currently have the funding and will continue to pursue partnerships, such as Oregon Dept. of Transportation, State ATV Allocation Committee for any additional funds needed for personnel to educate and enforce compliance.

The DEIS states "resource damage has continued to occur" (page 10). Why is resource damage still occurring and who is responsible for allowing it to continue? Is the public to believe that because you do an EIS and promise to stop resource damage that it will happen? Where is any enforcement currently or proposed regarding OHV use?

RESPONSE: There will always be a few irresponsible riders just as there are irresponsible non-motorized trail users. Through education, monitoring, enforcement, and volunteer help most of these problems can be addressed. The Education and Enforcement Appendix of this document is our best hope of reaching the irresponsible rider.

The Draft EIS writer seems to waver between whether a managed trail system will cause more off-trail usage and damage than the non-managed, ride where-you-wish system that is currently in effect. The following statement are made and we are unsure of the basis for them- 4.31d page 72; 4.32b page 75; page 78; 4.33c page 88, and 4.32d page 78. Table 4.8 shows that although wavering on effects of more trails, the author has incorrectly decided that more trails is equal to more use off-trail. What data from managed OHV trail systems support this concept? 4.31e page 72, 4.33e page 88, and page 94 - Statements that increased trail use will cause increase in user created trails and non-compliance. And non-compliance is a best case scenario is expected at 10% or worse case scenario 500 acres impacted. Based upon what? What documentation is the ONF using? What track records of existing USFS OHV management trail systems did they receive these facts from? Did they research East Fort Rock monitoring reports?

RESPONSE: The Interdisciplinary Team revisited its inconsistent message

regarding whether a managed trail system would cause more or less off-trail usage and damage. A consistent message has been incorporated into the FEIS. More trails would result in increased trail use and the increased potential for off-designated route use, especially in General Forest areas where off-designated route motorized use would be allowed. Increased trail use is supported by data from the East Fort Rock Monitoring report (1994, 1995), as well as the State of Oregon, State Comprehensive Outdoor Recreation Plans (1993). See page 38 of the FEIS for additional trend information. Whether this increased trail use will or will not result in additional "shoe-fly" trails will only be determined after several years of monitoring a fully implemented trail system. For now, the ID team felt it necessary to consider the possibility as a worse case scenario for environmental analysis.

The DEIS assigns OHVers the responsibility for resource damage. Responsibility rests squarely with the land managers. Land managers have not: 1. provided adequate signing or enforcement; 2. constructed or adequately maintained trails; 3. initiated an adequate user ethics public information campaign; or 4. provided clear maps consistent with the Forest Plan standards and guidelines.

RESPONSE: The intent and wording of the DEIS was not intended to "blame" OHV users for all resource damage occurring in the analysis area. The intent of this environmental analysis is to deal with the lack of adequate signing, clear policy of where motorized and non-motorized users may travel, implement a user education and enforcement plan, and to provide clear maps. OHV users have contributed to improving the situation as have non-motorized users.

page 35: insinuates that the high amount of vandalism is being done by only OHVs who were also the only ones to breach closed roads. As an OHV recreation rider what has witnesses not only permittees on OHVs on closed roads AND areas but also FS and BLM personnel. Could verbage be added that better explains that the violators are not necessarily only recreational OHV riders?

RESPONSE: This has been clarified in the FEIS. OHV's include jeeps and 4 wheel drive vehicles.

Noise from OHV use has diminished significantly in recent years. Many of the late model motorcycles and ATVs are extremely quiet (Rock Creek Sound Study 1993). To most animals, since OHVS can usually be heard before they are seen, the approach of an OHV is not as intimidating to wildlife as a silent approach of a non-motorized user (Ward 1980, Eckstein 1979. Barrett 1976, Muth 1988). Research has shown that while noise may initially startle animals, generally they adapt very well under most circumstances (Noise Management and Sound Testing 1992).

RESPONSE: Additional research has been incorporated into the FEIS.

Does the closure violations on page 87-88 only concern Class I and III ATVs? if not, to be fair it should be so stated.

RESPONSE: The monitoring report does not separate types of motorized uses that violated the closures. This has been clarified in the FEIS.

Risk of Noncompliance, Chapter 2, page 27, Alt E is compared as minimum risk of non-compliance because of clear policy? What are the effects of closure of historic uses off-designated routes by hunters, wood cutters, administrative use, and other permittees as well as OHV recreationist, and compliance and violations? Management direction may be clear in Alt F, but enforcement and non-compliance would not be minimal.

RESPONSE: It is assumed that most non-compliance occurs due to lack of adequate signing and maps. Helping recreationists know where they can and cannot go will continue to be difficult in Alternatives A-D, simply because it would be impossible to sign every scabland and riparian area in the analysis area. The data regarding differences in closure violations by hunters versus wood cutters versus administrative and permittee use is not available. Most violators are not caught, therefore the type of user cannot be adequately categorized. Therefore, this EIS focuses on all classes and groups of users.

3. ADMINISTRATIVE/PERMITTEE USES

The DEIS indicates that special uses will be accommodated to provide motorized access for permittees, administration, resource inventories, and collection of forest products. Does this include cooperating government agencies? It appears that there are inconsistencies in determining who gets to drive and who gets to walk in a closed area. We recommend that an area closed for motorized vehicles be closed to everybody, commercial or non-commercial. An area open for special or administrative uses should be open to everyone.

RESPONSE: Motorized access for administrative use does include cooperating agencies. Motorized access for administrative and permittee use while allowed in Alternatives A-D, in practice it is strictly limited. The number of trips and timing of trips is limited by the permit and operating plan of the permittees, and by District Ranger direction. For example, during Green Dot closures, employees must get District Ranger approval to travel on closed roads. The decision to allow administrative use is based on reducing the cost of work.

Trails, use areas, and future undertakings carried out under the umbrella of the DEIS could result in portions of PGT's right-of- way being designated for OHV use. The increased opportunities for OHV use created by the preferred alternative may also induce such use of the right-of-way in areas where OHV use is neither designated nor prohibited. Safety- Above ground facilities such as mainline values and pipeline markers pose potential hazards for OHV users traveling on rights-of-way, which were not designated for that purpose. PGT is concerned about liability. Decisions about designating any segment of the right-of-way for OHV use should not be made without consulting PGT, and, at a minimum, until erosion control issues are addressed at a site-specific level, which may require preparation of an erosion control plan.

RESPONSE: Specific effects to PGT right-of-way will be addressed at the site specific analysis level. The location of PGT and other right-of-ways will be considered when planning trail locations.

Permittee use may have significant adverse effects since they will be accessing the areas prior to grazing to repair or build fence. This is in the early to

late spring when the ground cannot take ORV use. It also puts tracks up steep slopes, across streams, etc. Who is going to police the permittees?

RESPONSE: Range permittee work is guided by the Allottment Management Plan and Annual Operating Plan. It is illegal to cause resource damage whether by permittee, administrative, or other use.

Page 4 refers to recreation and non-recreation use. Does this mean that the volunteer monitoring, and public scoping of projects receives less consideration than commodity users? If a company can use ORVs to evaluate a sale, anyone should be able to use ORVs to look at that same sale.

RESPONSE: Since this would constitute administrative use, the public can seek permission from the District Ranger to access a closed area for administrative review.

There is no analysis of the effects of allowing forest products gatherers OHV access. This would put numerous cuts in roadsides where gatherers leave the roads and zigzag through fragile areas. How can this even be proposed?

RESPONSE: The same restrictions on riparian and scabland motorized use would apply to forest product gatherers. It is illegal to cause resource damage no matter why the area is being accessed.

unnumbered page 4: These uses (primarily permittee) along with other recreationist and commercial user who happen to use OHV to access their particular goal should be analyzed separately from recreation OHV users who are exclusively using ATVs for their recreational goals. Hunters, fisherman, mushroom gathers, loggers, etc use ATVs on ONF but are not OHV recreationists. By including their impacts in your analysis a negative tone is created for this document toward OHV use.

RESPONSE: The differences between permittee, hunting, fishing, and other access by OHV versus OHV riding only are addressed through analysis of effects between Alternative E and all other alternatives. Also, any OHV use, whether to hunt, fish, or just ride an OHV, includes riding the OHV, therefore many of the effects were grouped together.

4.33d page 87; indirect effects to wildlife: I am concerned as an OHV recreationists, that other recreationists such as hunters may use OHVs to increase their success and that use may directly effect the trail opportunities open to OHV recreationist. Should hunter impacts be measured with other OHV recreationists? Can not green dot regulations also apply to hunters on trail systems? Would not the presence of a FS OHV rider on a trail system be a tool to address this problem?

RESPONSE: Wildlife biologists state that habitat is the limiting factor for wildlife populations, not hunter success ratios. Since hunter use OHVs to access areas, their use is counted as OHV recreation. In a Green Dot closure area, trails are also closed unless signed otherwise. Forest Service presence, accurate maps, and signing are tools that will be used in OHV user education (See Education and Enforcement Plan, Appendix E).

4. RESOURCE ISSUES

Which are the areas that are in good or excellent condition? Which are the areas that maintain high concentrations of wildlife, quality habitat, sensitive plants species or functioning hydrological systems?

RESPONSE: This information is not currently compiled and it is not needed at the programmatic analysis level. Most data is collected at the stream reach level, but it is not all entered into the Forest Service corporate database. The Oregon Dept. of Natural Resources has a List of Water Quality Limited Water Bodies 303 (d)(1) List (OR DEX. 1995) which utilizes Forest and Grassland water monitoring data. Also, there are maps showing streams in unacceptable condition on page 3-82 through 3-87 of the LRMP, FEIS (USDA FS, 1989).

DEIS states that many people felt that OHV use caused resource damage... Where is your analysis? Since when do perceptions enter into this? There IS extensive resource damage according to your own documents, and is WAS caused by OHV use.....document should read It is documented that....

RESPONSE: As documented on page xx of the FEIS, approximately 170 acres have been negatively effected by OHV use. This is not extensive damage when one considers that it occurred over 900,000 acres. The statement that people felt OHV use caused resource damage is based upon the difference in perception between people as to what constitutes resource damage. Is a track through a dry meadow, visible for a few days resource damage? To some people it is, to others it is not.

Leakage of toxic materials may have been an issue raised by some non-users, but land managers should realize that the probability is not an issue or a concern to be addressed. There is no documented evidence that fuel leakage from OHVs has occurred or would be significant if it did occur.

RESPONSE: Although the issue was raised on page 11 of the FEIS it was not analyzed in Environmental Consequences. This is because there are federal regulations dealing with dumping of any toxic materials that would apply.

Ecosystem Management- On page 52, there is discussion of road and motorized trail development and that all such development would be outside what occurred "historically across the environment", within the context of ecosystem management. Why is the Forest embarking on a course which appears to contradict the new Viable Ecosystems Management Guide?

RESPONSE: The entire discussion in Section 3.35a of the DEIS was deleted in the FEIS. It only confused the readers and did not make an important contribution to analysis needed for this FEIS.

WILDLIFE

There were many comments received concerning site specific issues. These included areas of particular concern such as South Boundary on Paulina

District, Bear and Trout Creek on Prineville District, treatment of Old Growth, talus slopes, sensitive raptor habitat, fragmentation of wildlife habitat, calving areas, protections of streams, meadows and other riparian habitat, OHV stream crossings, etc.

RESPONSE: This FEIS is part of a two stage decision making process. The first stage is the programmatic level, the same as the Forest Land Management Plans. At this stage no irreversible or irretrievable commitments of resources are made. At the second stage, site specific environmental analysis will occur when specific trails are proposed. It is at this second stage that these site specific concerns would be addressed.

More information is needed to better describe current road densities, how these will be effected by proposed motorized trails, and finally how these will effect big game habitat using the HEI. In our opinion, the traffic using motorized trails will have the same effect on big game as open roads. The effects analysis should display by management area, current and future road densities,combined with proposed motorized trail densities, for each alternative. HEI values should then be calculated, by management area, for each alternative so effects on big game can be better evaluated. Many road closures are tradeoffs as mitigation for excessive logging. Forest exceeds HEI standards, OHVs are no less disturbing to wildlife than autos, and they have the same effects if they stay on roads.

RESPONSE: A more detailed discussion of HEI has been added to the Environmental Consequences Chapter of the FEIS on pages 64-103. However, at the programmatic level it was not possible to calculate HEI for proposed trails since their site specific location by watershed is not determined at this level of planning. At the site specific level, HEI will be a consideration.

Wildlife References, Suggested Studies, effects of Noise

Many comments were received that questioned the validity of the references cited pertaining to effects of noise and motor vehicles on wildlife. The studies used were questioned because many did not have the same topography or climate as the Analysis Area and some studies dealt with mass start events in the desert, which would not be the case in the analysis area. Respondents included many new references that had not been used in the DEIS.

RESPONSE: Additional research has been incorporated into the Environmental Consequences Chapter of the FEIS. These additional references are also listed in the Literature Cited section. Some studies suggested by the respondents were not used because they too were either old, or did not directly pertain to the Analysis Area conditions. In some cases, the specialists felt enough references and data had been obtained to adequately analyze the environmental consequences of the proposed actions.

There were several comments regarding the lack of research used in the effects analysis regarding snowmobiles.

RESPONSE: Additional research on snowmobile effects and wildlife has been incorporated into the Environmental Consequences Chapter of the FEIS. The

East Fort Rock area has not monitored snowmobile effects.

How many miles of ML2 roads are closed every year on the ONF and Grassland? The standards established in the LRMP for road densities are not being amended by this DEIS. Does not the road/trail densities standards in the LRMP already address mortality, stress, reproductive effectiveness of wildlife on the ONF and Grassland?

RESPONSE: The following miles of MLS road were closed in the last 3 years: 1993- 129.5 miles; 1994- 246.4 miles; 1995- 131.6 miles. Over the last few years the Forest has utilized improved technology (GPS, GIS) to determine number, miles, and location of Forest and Grassland roads. We also have better information on the miles of open road. Roads are closed to comply with Forest Plan standards and guidelines, timber sale environmental assessment mitigations, watershed improvement, and other reasons. Even though the LRMP already addresses mortality, stress, and reproductive effectiveness of wildlife, some of the alternatives propose more trail development than the Forest Plan, therefore additional effects analysis was needed.

Sage Grouse p.85. The OHV and Grassland suitable habitats are on the outer limits of known grouse populations. This species referred to as "sensitive" in this DEIS is hunted in other locations in Oregon. In 1994 1,010 permits were issued for hunting.

RESPONSE: The western sage grouse is State listed as Vulnerable and is Region 6 Forest Service listed as Sensitive. According to an Oregon Department of Fish and Wildlife district biologist, the amount/loss of habitat is the limiting factor to sage grouse populations, not hunting pressure. Hunting is only allowed in areas where populations exceed habitat limitations.

Townsends big-eared bat. page 86. Do night roosts occur in the daytime? Are these roosts occurring in caves? OHV recreationists may pass by such caves, but are not known for exploring caves in conjunction with OHV use. With a designated trail system, known locations can be avoided.

RESPONSE: Townsend's big-eared bats will roost during both day and night usually in caves, but have been found roosting in buildings and boulder fields. This is a programmatic document. Before trails are constructed, there will be a site specific environmental analysis completed, which will address sensitive site/species concerns.

Even with OHVs in their currently unmanaged state, elk populations now meet or exceed Oregon Fish & Wildlife objectives. Please state how much you expect this to improve when OHVs and other recreationists have better management.

RESPONSE: The Oregon Department of Fish and Wildlife manages elk populations, the Forest Service manages habitat. Maintaining quality habitat will ensure long term species viability.

unnumbered page 6: It is unclear if the 70,206 acres of influence is all 1197 miles of trail or just the 852 miles of summer trail. Or 775 miles of new construction all trails? or 275 miles of new OHV trails or 450 miles of new

non-OHV trails? Does this include the 325.6 miles of new winter trails?

RESPONSE: This information is a summary of information contained in Table 4.10, page 99. The acres of influence include all trails.

East Fort Rock monitoring shows that hawks nesting not 25 yards from the OHV trail did not disturb their nesting behavior even after a spring event with 600+ riders not 25 yards from the nest.

RESPONSE: Not all raptors are as tolerant of disturbance during the nesting period as the red trail hawk. As for the Cooper's and Goshawk nests along the trail, the 1995 East Fort Rock Monitoring Report state, "Observations of Gashawk or Cooper's Hawk nesting outcomes were not sufficient to determine if OHV activity had any effect on nesting success". Additional research on raptors has been incorporated into the Environmental Consequences Chapter of the FEIS.

4.33c page 80 Direct Effects of Alternatives "Trails and areas designated for OHV use would receive enough disturbance to effect big game use of the area" How much disturbance? Based upon what user numbers? How much effect? 1%,5%, 10%? Habitat improvement has greater effect on big game species than disturbance from either motorized or non-motorized trail recreation. Studies provided with this letter indicate that big game do not change home-range from encounters of motorized recreationists on trail systems. Why doesn't the author analyze disturbance from non-motorized encounters? Why doesn't the author address snowmobile use off designated routes which occur during the winter and critical early spring seasons? Throughout the DEIS over statement of acres effected by trail construction have been used. With 25% of trails already impacted roads (page 72). 20% of trail on existing routes in scablands (page 3), leaving 55% of the 500 total proposed miles or 275 miles of trail that will be NEW construction. Table 4.6, page 73, uses a 6ft. wide average for an OHV trail! An OHV trail will average 4.5 ft. making the number of acres 150 for OHV and 109 for non-motorized if 2 ft wide. Is not the new non-motorized trail tread on Gray Butte wider than 2'?

RESPONSE: The guidelines set in the DEIS of up to 25% of new trails on existing roads, 20% in scablands, and 10% in riparian are guidelines only. New trail construction could not exceed these standards. The 6 foot wide OHV trail figure is not the proposed trail tread, it is the area of influence from the trail. Grey Butte trail tread ranges from 18" to 36" inches wide. Most non-motorized trail tread on the forest is 18". Additional research has been incorporated into the FEIS regarding wildlife and recreation interactions.

FISH

The LRMP made a commitment to improve riparian areas to excellent condition and increase native redband trout populations by 245% in the next 4 decades. How does the Forest propose to accomplish this with construction of new OHV areas in riparian areas? The final EIS should clearly document how implementation of this plan will INCREASE fish populations and by what percentage. Road closures have been used to minimize the potential negative effects of timber harvest in watersheds that are over threshold. Our expectation would be that OHV trails would not be constructed in areas where commitments to reduce road density, mitigate soil erosion, and mitigate for potential flooding have been made. As indicated in the DEIS (p34) total miles for high clearance vehicles is well above the Forest Plan projection. It is contradictory to sound resource management to build new road crossings and trails when existing road densities are already impacting other resources. We recommend the Forest close additional roads to accommodate this new use. An additional 500 miles of roads (OHV trails) is only going to exacerbate existing road density problems by further fragmenting habitat and interfering with hydrologic function. In Alt D, with 45% of the analysis area open to ORV use, you have no basis to state that there will be excellent protection of aquatic resources. Not even Alt E and F can assure excellent aquatic protection since, even in closed areas there is still significant trespass, especially in riparian areas. Would not closing 10% of roads in riparian areas have a greater effect than 50 miles of OHV trails that are designated to disperse use away from riparian areas to less sensitive resources?

RESPONSE: The Forest and Grassland plan to accomplish riparian management objectives through implementation of PACFISH, INFISH, and Best Management Practices at the site specific level. We are also implementing stream restoration projects and watershed improvement projects as areas are analyzed. Managent direction clearly states that site specific projects will not retard attainment of Riparian Management Objectives. In addition, Management Practices (BMPs) state, "If considerable adverse effects (from OHV users) area occuring or are likely to occur, immediate corrective action will be taken. Corrective actions include but are not limited to, reduction in the amount of OHV use, signing or barriers to redistribute use, partial closure of areas, closure to causative vehicle types, or total closure, and to structural solutions such as culverts or bridges. Alternative D would not provide excellent protection of aquatic resources. It would provide fair protection. This has been changed in the FEIS, Environmental Consequences, pages 75-79.

The DEIS states "Locate no more than 10% of new trails within riparian areas and no more than 20% of new trails within scablands." Is the public to assume that 30% of future trails will be located in sensitive areas? This is outrageous.

RESPONSE: This is the maximum allowable development of all new trails within riparian and scablands. This threshold was intended to serve as a baseline to determine maximum environmental consequences. At the site specific, project level analysis will determine effects of trail construction by watershed, adding in all other factors such as timber harvest and previous roading.

Watershed analysis is required for construction of new recreation facilities under PACFISH and INFISH and should include construction of all trails and facilities related to OHV development. Only Trout Creek and the NF Crooked River watershed analyses have been completed. Extensive trail development for motorized vehicles is inappropriate in many watersheds of the forest where past timber harvest activities, roads, and livestock grazing have already severely altered riparian habitats, peak flow and timing of runoff events, and channel morphology of stream channels.

RESPONSE: This is a programmatic document and watershed analysis will occur at the site specific level. Before trails are constructed, site specific analysis will address sensitive site and species concerns. Within PACFISH watersheds, a watershed analysis would generally be required when management activities are scheduled in RHCAs, however in the absence of a watershed analysis, the activity may still be accomplished if watershed or stream reach specific data would support the decision. In all cases, the rationale supporting it and the effects must be documented. Within INFISH watersheds, a watershed analysis would be required only when management activities are scheduled in RHCAs within priority watersheds (Squaw Creek on the Crooked River National Grassland). Other INFISH watersheds would not require a watershed analysis beyond the scope of NEPA. PACFISH and INFISH are interim documents and will probably be replaced by the time site specific project proposals are analyzed. It is not know at this time what the requirements for watershed analysis will be.

Since the trails are 6 ft. wide, they must be included in the Watershed Cumulative Effects model. Many watersheds have been at or over threshold in recent years. Construction of 500 miles or any number of miles of OHV use must be included in any future modeling for other management activities such as timber sales.

RESPONSE: Even though trails effect the Equivalent Harvest Area (EHA), the amount of area in any specific watershed should be small and within the margin of error for the proposed activity. Trail densities have their greatest effect on wildlife, drainage efficiency and sediment yield and when these effects are analyzed, the miles and area in trails should be included with that in roads. Table 4.8, page 92 summarizes this data.

The watershed/fish/riparian analysis is seriously flawed. Alternative A states moderate risk of damage when it has a high risk of non-compliance. Page 76 table 4.8: Acres of trail disturbance overstated. Why high rating for non-compliance (see ONFs own argument on page 78 top). Alt A and B have a greater potential for riparian impacts and effects to aquatic resources than Alt C, D, E, and F (page 77). Why then is D and E rated higher than Alt A and the same for Alt B in potential resource damage?

RESPONSE: The risk of non-compliance does not directly correspond to the risk of resource damage. The risk of damage is correlated to such factors as the amount of ground disturbance, soil erosivity, slope, and the distance to streams. Most people do not intentionally want to cause resource damage. Most non-compliance in Alternatives a-D would result from operators not being able to identify MAF-15 or RHCA boundaries and probably the best that operators would be able to do in areas open to off trail riding is try to avoid wet areas, stream channels, stream banks and flood

plains.

Much time and many resources went into this section for soils and fisheries data. The direct effect to OHV use is unclear. There are numerous studies on soil and trail construction, (Land System Inventory USFS 1992) that should be referenced for this section to be an important part of this document.

RESPONSE: Additional research and studies have been incorporated into the Environmental Consequences chapter of the FEIS.

Watershed and Riparian only analyze OHV impacts. Are any non-OHV trails to be allowed in riparian? OHV use is designated trails only in riparian areas. Will non-OHV use be allowed off trail? Vegetation includes some analysis of non-OHV use, but number of effected acres are grossly overstated for OHV. Riparian 50 miles of OHV trails= 50 acres veg, 8 ft wide trails? Should be 27 acres (Table 4.10 page 93,) 4.5' x 50 miles= 27.25 acres.

RESPONSE: Additional research and studies regarding non-OHV use have been incorporated into the FEIS, Environmental Consequences. Limiting non-motorized travel to designated routes was considered as an alternative but dropped from further analysis (page 25, DEIS). There was little or no evidence of resource damage from hikers, and only minor documented damage from horses traveling off-designated routes.

Are there truly 44% of roads constructed in PACFISH riparian areas, Table 3.6, page 50 (44% of 3,673 miles of open road = 1616 miles)? What is the impact of 5,616 acres of road influences, Table 4.10, page 93, in the 120,834 acres in riparian areas in comparison with a potential of a maximum of 50 miles of OHV trail? On page 35, it states that the majority of non-system roads are created by hunters and dispersed camping. What are the present impacts of dispersed camping which occurs in riparian areas compared with potential impacts of OHV trails in riparian areas?

RESPONSE: Road densities within RHCAs were based on PACFISH buffer widths. The buffer widths for non-fish bearing, intermittent streams (FS Class IV) in INFISH watersheds are one half the width of those in anadromous watersheds, so the actual percent of roads in RHCAs should be somewhat less than 44 percent. Road densities are very high within RHCAs because much of the Forest transportation system was developed for forest timber management practices no longer used.

The impact whether it is from roads or trails is based on: the age, use, type of tread surfacing, tread width, slope, soil erosivity, and the distance from streams. While the impacts from trails is less, the impacts contribute to cumulative effects. This is why closing roads in impacted RHCAs and narrowing the tread on existing roads (to become trails) in RHCAs are proposed as mitigation measures to reduce the impacts of new trail construction in RHCAs.

Non-system roads created by hunters, firewood gatherers and campers driving off system roads to dispersed camp sites are primarily a Class J vehicle problem. Different impacts are associated with different user types.

Dispersed camping adjacent to streams probably results in greater reduction

of shade than OHV trails would, but should not be increasing the drainage network as much. Sediment delivery would very depending on such factors as slope, the amount of bare ground and the distance to a stream.

PLANTS AND SOILS

P93. Table- questions accuracy of numbers in table under Cumulative effects - % of Riparian. Check numbers. If numbers okay then provide better discussion of their significance and effects in text.

RESPONSE: More discussion of Table 4.10 and explanation of headings is incorporated into the FEIS, page 100.

BLM lands around Smith Rock State Park are closed due to soil erosion and vegetation loss caused by OHV. There are currently trespass problems on BLM lands because of access through the Grassland. Concerned that OHV trails on neighboring Grassland will allow access onto BLM lands and lead to compliance problems and further resource damage.

RESPONSE: The Crooked River National Grassland is currently closed to OHV use unless designated open. With all alternatives except alternative B, the CRNG would remain closed except for designated OHV routes. Most of this ground is in winter range and would have seasonal closures. Mitigation could include keeping designated trails away from these BLM boundary areas. Trail concerns at Smith Rock State Park deal largely with pedestrian and horse traffic, which, at ever increasing levels, are causing significant damage themselves without the influence of OHVs. All overland traffic will have to be closely monitored in these interface areas. This will be addressed at the site specific planning level.

PGT took great pains to restore the preconstruction vegetation on its right-of-way (in 1992). In particular, restoration plantings at Mud Springs (mileposts 411.8, 413.7, and 413.9), Willow Creek (milepost 420.4), and specialty seeding areas for traditional use plants (mileposts 414-417 and 425-426) should be excluded from OHV use. PGT has also taken steps to control noxious weeds at its crossings of Ashwood and Ramms Roads (mileposts 411.7 and 422) and at milepost 412-417. OHV use of the right-of way could hamper efforts to control weeds at these and other locations.

RESPONSE: This information will be kept for site specific planning. Noxious weeds are an issue taken very seriously in hopes of preventing infestations before they occur, or at least catching the infestation early so something can be done before populations get out of control. A noxious week assessment analysis should be done for the site specific EA, and monitoring of noxious weed infestations should be a part of trail maintenance. Also, education about how noxious weeds are spread, what they look like, and suggestions for helping control the spread should be part of the educational tools available at landing sites and distributed to the various OHV groups who will be using these areas. Also emphasize the threat that noxious weed have and their ability to spread fast.

The DEIS states "Documented resource damage, which includes disturbance of vegetation on hillsides and riparian areas has been attributed to OHV use in inappropriate areas or during inappropriate seasons. Is the public to believe just because you do an EIS and promise to stop resource damage that it will happen? In the effects on soils area your agency discloses numerous negative effects on soils. So how can you propose the trails and facilities that you do knowing these negative effects? This is a violation of NEPA and any kind of resource protection management.

RESPONSE: Environmental damage from foot traffic, horses, livestock, OHVs, logging equipment, and roading has occurred throughout the world. The damage occurs as a result of increased demand for adventure, food, and fiber. The fact that an agency does an EIS to disclose potential impacts does not guarantee anything. Implementation of a particular EIS with associated mitigations and enforcement of designations depends on available funding and personnel.

The soils analysis is inadequate. It does not cover the entire general forest area that is proposed to be open. There is no way to move from one small area to another without crossing scablands, riparian areas, climbing slopes or adversely affecting other sensitive areas.

RESPONSE: This document is programmatic. Site specific analysis will address specific site soils and limitations. Limitations for OHV us on differing landtypes have been generally stratified based on the ONF soils Resource Inventory (in analysis file). Site specific mitigations will be designed on an individual project basis.

The studies cited in the Soils section are old, outdated, and do not apply to a well designated, well constructed trail. Why should the information, regarding the effects of OHV use on vegetation come from Hall 1980 when far more current documentation is available? Soils studies conducted by Joseph P. Seney, May 1991; from Montana Sate University (see above) states: "The multiple comparisons test results further clarify the roles of different treatments and in particular show that horses and hikers (hooves and feet) make more sediment available than wheels (motorcycles and Off-road bicycles) on prewetted trails. Reviewing the data in Table 12 show that only horses stand out from the other treatments in terms of sediment production and that the other treatments produces no significant differences". The Mt. Blue Impact Study by Mason and Anderson stated: "Any adverse effects that ATV use may have had on soil erosion was not readily apparent from the 1989 data". "The results of the analysis of the erosion of three soil plots during 1990 revealed no statistical differences in any of the three slope categories when the erosion in control plots was compared to that in the treatment and rotation plots".

"Soils which are very wet, loose, or on steep slopes tend to be particularly susceptible to damage by OHVs" see University of Montana Study (Trampling Effects of Hikers, Motorcycles, and Horses in Meadows and Forests, T. Weaver and D.Dale). The study concludes that motorcycle damage was greatest when traffic was up slopes while horse and foot traffic was most damaging when the traffic was downslope. If half a loop trail is uphill and half downhill, half of the greater impacts are from non-OHV users.

There are some studies done that compare OHV use on trails with other

recreational uses. The Motorcycle Industry Council, Inc, Irvine, CA has done surface pressure studies that indicate a per square inch downward pressure. Specifically, a snowmobile and rider exerts .5 pounds of downward pressure per square inch; and ATV and rider exert 1.5 pounds of downward pressure per square inch; a hiker (210 pounds- one person and gear) exerts 5 psi; a horse 8 psi; a four wheel drive highway vehicle 30 psi.

RESPONSE: On trails which are designated for multiple class OHV use, we are addressing the most detrimental impacts. Lighter OHVs such as 4 wheeler and motorcycles are recognized as being less compacting than jeeps and pickups but can detrimentally displace more soils due to their higher mobility.

It was recognized that there are significant difference between classes of OHVs as to extent and severity of compaction. For the purpose of the EIS, the various classes of OHVs were lumped- motorcycles and ATVs are much lighter than dune buggies, jeeps, small 4x4 pickups, which in turn are lighter than full size 4x4x. However, if they all run on the same trail we are analyzing potential impacts of the largest machine.

The amount of soil disturbance is inconsequential, .0005% for the whole project area. Please put all the soil/plant disturbance figures in this perspective. After 20 years of largely unmanaged OHV use only 170 acres are known to have historic impacts out of 964,000 acres. This is only .00017% of the analysis area.

RESPONSE: Positive or not, OHVs contribute to cumulative impacts at the current time and have the potential to contribute more under increased use. It is recognized by this soil scientist and others that the OHV contribution to overall cumulative impacts is minimal when viewed in the same context as roading, logging, and livestock impacts. This point has been made stronger in the FEIS, Environmental Consequences, Section 4.34e Cumulative Effects to Soils, page 94.

Please also describe how plants generally thrive and multiply in a soil-disturbed environment. In fact, lack of disturbance can lead to over-maturation of some species and elimination of others: a loss of plant diversity. This discussion would be appropriate when describing cross-country travel.

RESPONSE: Early seral vegetation can be encourage through a variety of disturbance factors- livestock, wildlife, fire, weather events, and mechanical disturbance such as wheels and tracks. The issue is how much of this condition is desirable. The ONF has a considerable acreage in early seral stages at present. Disturbance to some community types can be detrimental to vegetation and soils. Some species could be displaced or even disappear due to disturbance. Also, the community types that are disturbance dependent, are normally not accustomed to the type and frequency of disturbance which is associated with OHV use. The cumulative effects of all the disturbances occurring on the ONF has lead to an over-abundance of early seral vegetation and community types. Also, the risk of introduction of non-native plants from tire tread increases with the amount of disturbance.

Please describe how a well constructed trail stays where it is placed, resists erosion, and takes little maintenance. Please discuss how well constructed trails will result in a net benefit to soils and plants over the present condition (poor construction and location resulting in erosion, ect.).

RESPONSE: Yes, well constructed trails, often using more expensive construction techniques, are more stable and resist erosion. However, they still contribute to artificially high runoff by increasing the hydrologic net. Trails, like roads, intercept, redirect and concentrate runoff often resulting in increased erosion and subsequent sediment delivery to streams. Trail construction may also bring an increase of unwanted vegetation, which may not trap sediment and runoff as well as native species.

It has been clearly shown through the implementation of a managed trail system on the Deschutes National Forest that users stay on the trails, and that plants have not been compromised. The fact that plants are actually flourishing on some trails, showing a disposition to thriving under the soil disturbance on the trail. It was also shown not to be beneficial to the plants to try to overly protect them by artificial means (barriers) nor was it necessary because the users stay on the trails provided.

RESPONSE: What happens on the Deschutes National Forest is not necessarily representative of effects and usage that could occur in the analysis area due to different terrain, soils, and vegetation types. In addition, Alternatives A-D leave the General Forest Area open to off-designated route travel, while the East Fort Rock OHV area enforces no off-designated route riding. The East Fort Rock area has different soil types and vegetation, thus resulting in different sensitive species with different ecological requirements. It is not possible to generalize about the reaction of one particular sensitive plant and expect the same reaction from an entirely different sensitive plant in a different ecological community.

Unnumbered pages 5,6,7: It would be interesting to note confusion appears to exist among the authors. Page 79, 4.33d Wildlife includes a disclaimer that non-motorized impacts on wildlife are not discussed in detail and none are included in the chart on page 82. Soils include non-OHV impacts to toils which total 473 acres. This 473 acres is stated as OHV only soil disturbances on unnumbered pages 5 and page 28. Soils does show a difference on Table 4.6 page 73, however the 500 miles and 364 acres are grossly overstated as soil impacts, but at least non-OHV use was analyzed. Scablands equal 100 miles of trail on existing non-system roads, no new acres of disturbance, unnumbered page 1 and page 5 and 16. Forest lands equals 275 miles of NEW trail (remaining 125 miles on existing roads) is equivalent to 364 acres of vegetation which is an 11 ft wide trail. At least non-OHV trails are discussed, but OHV impacts acres are overstated. True number of acres of new construction for OHV is 275 miles x 4.5 ft = 150 acres. Alt D, OHV acres of vegetation direct effects are 150. 275 miles of new trail at 4.5 ft. If the 8 mile Green Mt trail and the 25 miles of Henderson Flat trail become part of the system, then NEW TRAIL MILES could be as low as 242 miles or 132 acres of vegetation disturbance from OHV trail construction.

RESPONSE: The acreage figures listed were rechecked and validated to be accurate as listed in the DEIS. First, these are minimal figures based on

the assumption that OHVs will stay on the trails and that they are available for use by ALL classes of OHVs. This includes jeeps, small 4x4 pickups and sometimes large 4 x 4 vehicles. Unless specifically excluded by designation and/or selective barriers these classes of OHVs commonly traverse many of these trails. This is a common progression of disturbance, especially on the high desert and in flat terrain such as much of the ONF and CRNG.

unnumbered page 5:(?) 473 acres is from all trail construction. Since the motorized use on potential impacts are usually separated why not separate trail construction? With 20% of the OHV trails in scablands (allowing on existing routes only, 1.1 page 3) and 25% of OHV trails on existing roads (4.31d page 72) the remaining 55% of 500 miles would be 275 miles of NEW trail construction. OHV trails are 4-5 ft wide . Chart 4.6 page 73, states the trails are 4-8 ft wide, equally, for an average of 6 ft and a total acreage of 364 acres. Conveniently ignoring the 45% of OHV trails that will be on previously constructed roads. The true impacts for new construction should be changed from 473 acres (Alt D and E) to: 150 acres OHV new construction; and non-motorized to 109 acres new construction. This change should also be made to other alternatives: A=57 acres; B=4 acres; C & F = 75 acres. Also potential for soil disturbance from non- motorized designated routes could be 963,957 acres (table 4.6 page 73).

Table 4.10 page 93 shows off-designated use at 53,326 acres in scablands which are closed to OHV off-designated route trail use! And further indicates 379,075 acres off-designated routes which is 39% of Analysis Area. The OHV trail system will utilize previously disturbed ground which is not reflected in the acreage figures in Direct Effects OHV. Also the off-route use does not reflect the restrictions in Alt D in scabland acreages and riparian areas. In cumulative effect Alt D Scabland off Designated Route use, 53,326 acres is not correct. Scabland are restricted from open riding in Alt D. Alt D restricts travel in scablands to existing routes. Where does the 53,326 acres come from?

Veg Cumulative Effects: Riparian OHV trails 50 (10%) miles show 50 acres. Scabland OHV trails 100 (20%) miles show 56 acres. Forestlands OHV trails 350 (70%) miles show 240 acres. Total acres for OHV trails indicate 346 not 364. Which number was transposed? 364 is used throughout the DEIS. Should this be 346? Which indicates the average OHV trail is 5'7" in width? Still overstated if all 500 miles were new trail, only 272 acres would be impacted.

RESPONSE: OHVS for the purposes of this programmatic document includes jeeps, small 4x4s and full size pickups. Therefore, we have used an average of 6 feet not 4 to 5 feet.

These figures for scablands and forestwide figures were for POTENTIALLY impacted ground. The fact that OHV use was allowed on existing two track roads through scablands, many of which are not designated as official roads, was used as a basis for including this acreage.

364 acres is the correct figure based on average width of 6 feet based on mixed use of ATVs and larger OHVs such as jeeps and pickups. 500 miles x 0.727 acres/mile = 364 acres.

Table 4.1 Effects on Vegetation by Alternative Overall Ranking, there has been no consideration to the facts that trail system put use on designated trails

avoiding sensitive habitats and sensitive species and will reduce use and thus less impacts off trails. Secondly, by designating trails and maintaining them, the land managers have a monitoring and mitigation tool for the control of vegetation impacts including spread of exotic species and noxious weeds.

RESPONSE: Trails are, by their very nature, usually compacted and often have displaced soil on turns and on slopes especially on typical wildlife trails. Consideration for locating trail away from sensitive species and habitat are incorporated into Appendix F, Trail Location & Design Guidelines. Monitoring and mitigation for trails systems would not be needed if a trail system was not there.

Sect 4.34 VEG: It appears that this section deals ONLY with OHV use except when acres are totaled in some cases. ALthough the number of new acres impacted by trail construction are nearly the same 109 and 150. As shown by the University of Montana study, Weaver and Dale indicate that downhill travel by hikers and horses area greater than downhill travel by motorcycles. ATVs conversely have less potential for impact uphill and downhill as evidenced by the MIC psi finding of 1.5 psi in downward pressure for an ATV and rider compared to a 210 hiker with gear at 5 psi or a horse and rider at 8 psi. Soil: Unnumbered page 5: displacement from OHV use- Why only OHV use? This document provides 181.8 miles of new non-motorized summer trails.

Why are impacts from other trail users not present in section 4.34 Vegetation? Do horses, hikers, mt. bikes, hunters, woodcutters, other permitee's have no impacts on vegetation? What are the impacts of grazing in relationship to OHV users, non-motorized uses?

RESPONSE: It is recognized that motorcycles and ATVs have less detrimental compactive effects than larger 4x4 jeeps and pickups. It is also recognized that horses and livestock in general can compact soils to 10 inches or more. It was considered beyond the scope of this analysis to differentiate this level of detail in a programmatic EIS when specific classes of use have not been designated for specific areas. When a specific trail system is proposed this will be stratified out and determined by the designated use or uses of a particular trail. Although impacts of non-motorized trail users was considered in this section, the impacts were not clearly displayed. This has been corrected in the FEIS. The impacts of grazing are beyond the scope of this analysis, except for discussion in cumulative effects.

Over 30% slopes needs better definition. Travel on any slope that has over 30% or the trail tread that is over 30%? Many designated trails traverse much steeper slopes, but because of the "attach" angle the actual tread is much less than 30%. Green Mt. trail traverses 30% slope but the trail tread is virtually flat.

RESPONSE: The 30% slope recommendation was specifically for off-designated route use in General Forest areas (see page 22-23 of FEIS). Properly engineered trails or trails specifically designed to provide a greater challenge on steeper slopes may be allowed after site specific analysis is done. These steeper slopes are where much of the detrimental displacement and erosion occur. In the analysis area, many of the steeper slopes are covered with deep sandy loam ash soils which are very susceptible to

disturbance by OHVs.

OTHER CONCERNS

If there are any planned activities which will disturb or destroy geoditic control monuments, National Geoditic Survey requires not less than 90 days notification in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project include any cost of relocation required.

RESPONSE: The computer disks with monument locations are on file in our office and will be consulted at the site specific project level.

Please include an adequate index.

RESPONSE: The index has been expanded for this FEIS.

CULTURAL RESOURCES

Has there been any consideration given to actually routing part of the trail system to a heritage resource? This could be used for interpretation and education of something worth sharing with the users. Not all resources must be looked at in a manner that must have them locked away, protected from view and the public land and an attitude that consistently states that the agency must "limit damage" is biased and prevalent in this document.

OHV access to cultural areas, such as archaeological and plants, needs to be controlled. OHV travel off-designated roads and trails is disturbing, especially since they are impacting around 170 acres. The Tribe encourages the forest to protect archaeological and plant resources under their jurisdiction. In some cases, fencing of sites may be desirable, which would limit OHV access. Off-road and off-trail use should be prohibited. OHV travel off designated trails could lead to the destruction of cultural plants important to the Tribe.

RESPONSE: As trail locations are identified and surveys are conducted to locate archeological sites, opportunities for off-site interpretation could develop. Off-site interpretation would allow disseminations of information about an area or activity while protecting the site's location and limiting the opportunity to loot or damage the site. Site avoidance is prefrred to site fencing for protection. Fencing could require a large investment of people, materials, and money. Fencing could also draw attention to sites and this attention could lead to site looting or damage.

ECONOMICS

The FS preferred Alt D may involve significantly greater monitoring, management and enforcement costs than Alt E and F, which have more definitive designations and closures. What is the cost differential?

RESPONSE: Cost was not an issue at the programmatic level.

APPENDIX H