

Chapter 4—Assessing Benefits, Problems, and Risks

Introduction

The road analysis guide (Roads Analysis: Informing Decisions About managing the National Forest Transportation System, Miscellaneous Report FS-643) provides direction and suggestions about how each question could be answered at various scale analyses. For questions related to Economic Issues, and Social Issues (including Cultural and Heritage Issues, and Civil Rights and Environmental Justice), the revised or alternative questions recommended through the National Forest Service Engineering website (through the San Dimas Technology & Development Center website) were used in place of the questions in FS 643.

The IDT used the overall guidance provided in those documents, but decided it would attempt to answer most of the questions at the Forest-scale to provide at least background information for each question for referencing and citing purposes during sub-forest scale roads analyses. The detailed answers addressing the questions related to the benefits, problems, and risks of the current road system are displayed in Appendix C.

Tools and Methods for Assessment

To assess the problems and risks posed by the current road system, the IDT evaluated the potential minimum primary system roads, using a combination of GIS assessments, local knowledge, and professional judgment. There were some inherent limitations in the data used. The available GIS data was not always complete or consistent across all of the lands managed by the Forest. The soil erosion hazard or sensitivity ratings used different rating methods, the one developed on the Malheur for Malheur National Forest Lands differs from the one developed by the Ochoco, for Ochoco National Forest Lands. The Geologic sensitivity ratings were developed using the GIS coverage based on the State **Geologic Map of Oregon** (Walker and MacLeod, 1991), which had known accuracy limitations. However, the IDT determined that, when used in combination with local knowledge and professional judgment, the GIS coverage was adequate to use for determining the watershed and aquatic risk ratings at the scale of this analysis.

Watershed and Aquatics Risks of the Minimum Primary Road System

The analysis team included personnel that have worked on the Forests for extended periods of time, in several cases over 20 years. They were familiar with most of the Forest and most of the primary road system. When the team did not have knowledge of specific roads, in most cases District personnel were recruited to provide assistance. The primary roads were first rated for soils and geology risks based on GIS layers, and then the watershed risk was determined based on combined soils and geology ratings, road-

stream proximity, known road conditions, and professional judgment. Aquatics risk was evaluated based on road-stream proximity, aquatics species present, known road conditions and professional judgment.

The road tables in Appendix A display the current operational maintenance level of all of the potential minimum primary system roads, the relative watershed and aquatics risk ratings, current estimated annual and deferred maintenance costs, and additional information. The road tables identify which of the minimum primary system roads currently have the greatest resource risks. Map B3 in Appendix B displays the overall watershed and aquatic risk ratings for the recommended minimum primary road system. The roads with highest risks indicate that relocation and or improvements should be evaluated during sub-forest scale projects. As more information becomes available, the road table information should be validated and updated.

Watershed and Aquatic Risks by 6th Level HUC

The effect of roads on the watershed and aquatic resources was analyzed using GIS computer technology combined with the Forest transportation inventory and cartographic feature files. This portion of the analysis included the potential minimum primary system roads alone as well as all other classified roads. The analysis considered road densities, road/stream proximity, road surface types, road stream crossing densities, and other elements, and used all of these factors combined with local knowledge and professional judgment to assess overall potential risks to the water and aquatics resources for Forest Lands in each 6th level HUC sub-watershed.

Appendix D describes in detail and displays in tables all of the risk rating elements that were used to determine overall watershed and aquatic risks for Forest Lands in each sub-watershed on the Forest. Appendix B also includes maps that graphically illustrate the ratings. The overall watershed risk ratings produced by this assessment provide a basis for prioritizing sub-forest scale roads analyses.

Table 13 below displays a summary of the risk rating results:

Table 13 – Sub-watershed Risk Rating Summary.

OVERALL WATERSHED RISK			OVERALL AQUATIC RISK		
Rating	Number of sub-watersheds	Percent of total sub-watersheds	Rating	Number of sub-watersheds	Percent of total sub-watersheds
Extreme	13	8%	N/A	N/A	N/A
High	79	49%	High	25	15%
Moderate	55	34%	Moderate	30	19%
Low	14	9%	Low	106	66%
Total	161	100%	Total	161	100%

Five of the seven rating elements (Chapter 2) for Watershed Risk were related to road densities, so the overall ratings are closely related to overall road densities for each sub-

watershed. Sub-watersheds with an extreme or high watershed risk and a high aquatic risk should be considered as the highest priority for future analyses. Those sub-watersheds as well as those with extreme or high watershed risk and moderate aquatic risk ratings are displayed below in table 14:

Table 14– High Priority Sub-watersheds on the Malheur

Extreme Watershed Risk and High Aquatic Risk (3%)	
Name	HUC Number
Fields Creek	170702011103
Granite Boulder Creek	170702030203
Middle Camp Creek	170702030206
Lick Creek	170702030207
Lower Camp Creek	170702030208
High Watershed Risk and High Aquatic Risk (4%)	
Bosenberg Creek	170501160103
Cliff Creek	170501160105
Crane Creek	170501161103
Upper Canyon Creek	170702010701
Mill Creek	170702030106
Vinegar Creek	170702030201
Little Boulder Creek	170702030202
Extreme Watershed Risk and Moderate Aquatic Risk (2%)	
Bear Creek	170702010803
Magone Creek	170702010901
Indian Creek	170702030303
High Watershed Risk and Moderate Aquatic Risk (10%)	
Vance Creek	170702010703
Dixie Meadows	170702010802
Cottonwood Creek	170702010902
Clear Creek	170702010903
Squaw Creek	170702030101
Idaho/Summit Creek	170702030102
Dry Fork	170702030103
Coyote Creek/Balance Creek	170702030205
Mosquito Creek/Bear Creek	170702030301
Upper Scotty Creek	171200020103
Upper Bear Creek	171200020201
Upper Camp Creek	171200020302
Trout Creek Forks	171200020307
Crowsfoot Creek	171200020601
High Watershed Risk and Moderate Aquatic Risk (10%)	
Bear Canyon Creek	171200030603
Little Emigrant Creek	171200020604