United States
Department of
Agriculture

Forest
Service

Pacific
Northwest
Region

2003

Record of Decision

Five Rivers Landscape Management Project

(Actions Connected to Commercial Thinning and Associated Actions)

South Zone Ranger District
Siuslaw National Forest

Record of Decision

Five Rivers Landscape Management Project

(Actions Connected to Commercial Thinning and Associated Actions)

Siuslaw National Forest
South Zone Ranger District

Lincoln and Lane Counties, Oregon

May 2003

Lead Agency: USDA Forest Service

Responsible Official:
Gloria D. Brown
Forest Supervisor
Siuslaw National Forest
4077 Research Way
(P.O. Box 1148, 97339)
Corvallis, OR 97333

For Further Information Contact:

Paul Thomas	Bruce Buckley
Planning Manager	Resource Planner
Waldport Ranger District	Waldport Ranger District
P.O. Box 400	P.O. Box 400
Waldport, OR 97394	Waldport, OR 97394
(541) 563-3211	(541) 563-3211
E-mail address: pgthomas@fs.fed.us	bbuckley@fs.fed.us

Contents

Project Background, Area, and Needs

The Five Rivers Landscape Management Project (the Project) is a package of associated terrestrial and watershed restoration projects. They include commercially thinning and enhancing species and structural diversity of plantations about 25 to 50 years old, precommercially thinning plantations about 5 to 15 years old, closing and decommissioning roads, placing large conifer trees—up to 36 inches in diameter at breast height—in streams, and planting conifers and hardwoods in riparian areas. A management study, designed to compare management strategies, is part of the proposal. Most actions would be completed in 10 to 15 years, with most commercial timber-sale contracts awarded in the first 5 years. The final environmental impact statement (FEIS) for the Project is on file at the Siuslaw National Forest Supervisor's Office, and at the Ranger District offices in Waldport and Florence, Oregon.

The area included in the Project lies within the Five Rivers-Lobster Creek 5th-field watershed of the Alsea River basin. The planning area is about 34 air miles southwest of Corvallis and 40 air miles northwest of Eugene, Oregon (map R-1). It includes eight subwatersheds and covers about 37,000 acres; about 13% is privately owned, and the rest is managed by the USDA Forest Service. The legal location is T.14S., R.9W., Sections 6, 7, 17-20, 30-32; T.14S., R.10W., Sections 15, 20-29, 32-36; T.15S., R.9W., Sections 4-10, 14-23, 26-34; T.15S., R.10W., Sections 1-5, 8-16, 20-29, 34-36; and T.16S., R.9W., Sections 3-6, 8, 9.

Four needs (issues) requiring action in the Project area were identified in chapter 1 of the FEIS:

- To learn from a variety of strategies for achieving late-successional forest conditions and aquatic conservation because no single strategy is known to work best;
- To speed the development of late-successional habitat in late-successional and riparian reserves;
- To improve the health of watersheds and associated aquatic ecosystems; and
- To maintain the function and diversity in matrix lands while providing timber and other products and amenities.

The decision to be made is whether to implement actions designed to meet the Project needs by selecting Alternatives 1 or 2, or to postpone these actions by selecting Alternative 3 (no action).

My Decision

I have decided to implement all the terrestrial and aquatic restoration actions described under Alternative 1 of the Project FEIS that **are connected to commercial thinning and associated actions**. My decision includes commercial thinning in the study pathways identified in the Plan for the Five Rivers Landscape Management Study (2000) and road decommissioning associated with existing and potential commercial thinning units.

The actions affected by this decision are summarized by subwatershed in Table R-1; maps R-2, R-3, and R-4 further illustrate the alternative. Appendix C identifies plantations for commercial thinning. Two appendices contain a list of roads to be decommissioned (D) and a list of

plantations to be noncommercially thinned (E). Most actions are expected to be completed within 5 years.

Table R-1. Description of Alternative 1 by subwatershed

Actions	Cascade	Crab	Green River	Lower Buck	Lower Five	Middle Five	Upper Buck	Upper Five	Total
Commercial thinning (acres)									
Total commercial thin	211	747	469	472	211	233	367	520	3,230
Commercial thin, skyline	163	702	406	459	211	233	334	438	2,946
Commercial thin, helicopter	48	45	63	13	0	0	33	82	284
Comm. thin inside study	125	369	257	150	126	71	104	0	1,202
Comm. thin outside study	86	378	212	322	85	162	263	520	2,028
System (classified) roads (miles)									
Reopen roads	0	2.01	0.89	0.95	2.12	0	0.76	0	6.73
Decommission roads	11.1	4.30	6.0	1.00	1.6	0.10	0.50	0.40	25
Temporary (unclassified) roads (miles)									
New roads	0.08	0.20	0.07	0.17	0.15	0.07	0	0.28	1.02
Reopen roads	0.25	1.06	1.11	2.09	0.40	1.56	1.50	1.62	9.59
Snag and coarse wood creation (trees)									
Mature tree topping	148	225	329	141	63	69	112	156	1,243
Trees inoculated in commercial thinning, including 20% mitigation	359	1,569	798	991	443	489	773	1,092	6,514
Trees inoculated in unthinned portion of plantations (enhancement)	192	739	958	804	260	275	316	706	4,250
Trees felled for coarse wood	4,260	4,255	4,530	3,620	1,055	1,745	3,000	2,600	25,065
Other actions									
KV noncommercial thinning (acres)	97	356	101	277	310	133	162	411	1,847
Area maintained in early-seral condition (acres)	5.7	20.7	5.2	4.0	0	29.9	0	0	65.5
Stand underplanting (acres)	135	435	359	160	63	96	194	146	1,588

Map R-2

Map R-2

Map R-3

Map R-3

Map R-4

Map R-4

The environmental consequences associated with these actions are described in the FEIS (pages 47 to 85) and reflect their connection to commercial thinning.

My decision is based on several factors. Terrestrial restoration under Alternative 1 best meets the Project's needs described in chapter 1 of the FEIS. In addition, Alternative 1 has been further developed to address issues raised from comments on the draft EIS. These issues include road access, survey-and-manage species, water quality, and validity of the study plan. The FEIS and its appendices A and B provide details on how these concerns will be addressed. Lastly, I believe that Alternative 1 does the most towards improving the long-term health of the watershed by restoring it to a more natural condition.

All the actions proposed in Alternative 1 meet or exceed late-successional reserve and Aquatic Conservation Strategy objectives as outlined in the Northwest Forest Plan.

Alternative 1 best meets the project needs:

- To learn from a variety of strategies for achieving late-successional forest conditions and aquatic conservation.

  I have decided to incorporate a study plan as part of this project to help ensure that we benefit from what is learned from our actions, allowing us to make better decisions in the future. Much of the current dialogue about forest management actions (such as thinning) centers around the timing and frequency of those actions, almost more than about the actions themselves. Is continually managing an area—perhaps incurring only short-term effects—better than entering an area, working aggressively, and then pulling out for an extended period to let the area "rest"? Some people suggest that a compromise between the two is best, and others advocate no management at all. A study design has been applied to the Five Rivers project that establishes "pathways" to monitor these various management regimes. The peer-reviewed, science-based study plan (FEIS, appendix A), will strengthen and validate what we learn about the long-term effects of our management actions over the long term and which of these methods (or combination of methods) achieves the desired outcomes most quickly or effectively.

- To speed the development of late-successional habitat in late-successional and riparian reserves.

  The Forest's legacy lies in its abundance of land in late-successional and riparian reserves. Forests on the coast also have very rapid growth rates. The Siuslaw offers a rich potential for successfully creating late-successional habitat with old-growth characteristics at a landscape scale. Most of the Siuslaw has been heavily harvested in the past, and plantations are densely stocked with Douglas-fir. Research has clearly shown that the current landscape of densely packed, uniform stands of Douglas-fir are a long way from the complex and diverse old growth forests we hope to develop. Thinning these stands is expected to speed the growth of the remaining trees and allow them to grow in both diameter and height. Variable thinning (thinning at different intensities in different

areas) and underplanting with other tree species will also increase stand diversity and complexity. Leaving some trees on the ground adds to the richness on the forest floor, creating habitat as well as supplying critical nutrients. Creating snags provides nesting and roosting opportunities for cavity dwellers. We believe the proposed actions as described in Alternative 1 are necessary to accelerate the development of healthy late-successional habitat.

- To improve the health of watersheds and associated aquatic ecosystems.

  The Five Rivers watershed has about 456 miles of perennial and intermittent streams, some of which provide important fish habitat. Water quality and quantity are directly tied to watershed health. All of the actions in Alternative 1 are designed to restore or improve the watershed by increasing the diversity and complexity of aquatic habitat, by reconnecting or removing barriers to natural processes, by maintaining or improving stream shade, and by ameliorating unnatural conditions.

  Many of the streams, or portions of streams, are not healthy. The Five Rivers mainstem is too warm to provide quality habitat for fish. Often, unhealthy streams lack debris that allows gravel to build up and provide fish spawning habitat, connectivity to slow-moving water for smolts during floods, or both. Mid-slope roads keep some streams from flowing naturally. In other areas, roads block fish passage between tributaries and mainstems, interfering with natural landslides that move upslope trees and debris into the stream. Alternative 1 will improve fish habitat and water quality by decommissioning about 25 miles of roads. The decommissioning of roads associated with commercial thinning, particularly mid-slope roads, will restore natural hydrologic processes and reduce the risk of human-caused landslides.

- To maintain the function and diversity in matrix lands while providing timber and other products and amenities.

  Alternative 1 maintains the function and diversity in matrix lands while providing timber from plantations.

Decision summary

Although Alternatives 1 and 2 provide many of the same benefits to watershed health and accelerate the development of late-successional old-growth characteristics, Alternative 1 provides additional benefits by repairing existing road-failure sites and stabilizing the road sections behind them.

Alternative 3, the no-action alternative, does not create obvious negative effects, but it also does not meet any of the Project needs. And, without some restorative actions, some watershed conditions—including water quality and fish habitat—would continue to degrade.

Alternative 1 also best meets my expectations for holistic and integrated watershed restoration. No unacceptable cumulative effects to any resource are expected. Many beneficial effects will

accrue from implementing the Project, and the risk associated with any potential negative effects, discussed in chapter 4 of the FEIS, is acceptably low.

In my review of the Project FEIS and associated appendices, I believe the information provided to me is adequate for a reasoned choice of action. I am fully aware that the selected alternative will have some unavoidable adverse environmental effects such as disturbance to wildlife (FEIS, page 83), irreversible resource commitments such as continued use of existing roads (FEIS, page 83), and irretrievable commitment of resources such as loss of vehicular access through the Forest as roads are closed or decommissioned (FEIS, page 84). I have determined, however, that these risks will be outweighed by the likely benefits. Additionally, in their letter dated June 10, 2002, the Environmental Protection Agency has reviewed the Project FEIS and has found that it adequately discloses the likely effects.

In addition to reviewing the Project FEIS in making this selection, I have reviewed information in the administrative record, including but not limited to the Siuslaw Forest Plan (1990), as amended by the Northwest Forest Plan (1994); the Lobster-Five Rivers Watershed Analysis (1997); the Late Successional Reserve Assessment, Oregon Coast Province Southern Portion (1997); the Five Rivers EIS Roads Analysis Support Model (2001); consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service; public and other agency comments; and applicable laws and regulations.

My decision to implement actions **not** connected to commercial thinning was made on April 10, 2002, through a Record of Decision (ROD) for the Five Rivers Landscape Management Project. In her letter dated May 24, 2002, Acting Deputy Forest Supervisor Doris Tai decided to postpone the decision on the future of Forest Service Road 3200 (Road 32) until such time as the Forest Service, the concerned residents, and Lane County Road Department can reach agreement on a variety of issues. These issues include short- and long-term maintenance of Road 3200, emergency access, and the viability of the proposed alternative route (Forest Service Roads 3505, 3509, 3510, and 3259). The letter also verified that both the proposed alternate route to Road 3200 and the Buck Creek route between Yachats and Five Rivers will be maintained as ATM low-clearance roads.

Mitigation

The Five Rivers Landscape Management Project FEIS contains design criteria (appendix B) associated with terrestrial watershed restoration actions--including mitigation and monitoring--as well as for other Project actions not related to this decision. All design criteria pertaining to this decision apply, except section IV on pages B-16 and B-17, the Green River bridge (B-19), and the private-road permit (B-20). The criteria are designed to mitigate project actions or enhance existing environmental conditions in the watershed. The natural resource elements requiring mitigation are identified; they include protecting threatened and endangered species, protecting soils and aquatic resources, and preventing the spread of noxious weeds.

Alternative 1 will have some short-term adverse effects from the actions proposed. I believe these effects will be greatly outweighed by the long-term benefits to watershed health and late-

successional habitat. In addition, design criteria (appendix B) such as seasonal restrictions and measures to reduce sediment will minimize on-site effects.

Monitoring

Tables A-3, A-4, and A-5 for the Five Rivers Landscape Management Project (appendix A) identify the monitoring plan associated with the management study. In general, funding for monitoring is limited. To address this concern, we identified key monitoring components of the study so they will likely be included in the Forest's normal program of work. Additional monitoring for the study would likely require additional funding or support. We expect to accomplish the monitoring objectives identified in appendix B.

Key elements of the study's plan include monitoring roads and forest effects on roadsheds under the three different management pathways; stream, riparian, and water-quality effects; disturbance effects; and institutional learning.

Key elements of the other portion of the Project include implementation monitoring--meeting Forest Plan standards and guidelines, meeting the U.S. Fish and Wildlife Service's terms and conditions (pages 50 and 51 of their biological opinion, March 27, 2002; FWS reference 1-7-00-F-074), and reviewing contracts to ensure the activities are implemented as designed; and effectiveness monitoring—managing vegetation, treating roads, and treating fish habitat.

Forest Plan Consistency

I find this decision to be consistent with the Siuslaw Forest Plan (1990), as amended by the Northwest Forest Plan (1994), and it is designed to meet or exceed the objectives of the Aquatic Conservation Strategy. This decision is also consistent with the requirements of the National Forest Management Act (1976) implementing regulations, including the seven management requirements listed in 36 CFR 219.27, a through g:

a. The Five Rivers Landscape Management Project FEIS includes criteria designed to protect resources, and it will apply practices as described in general water-quality best management practices, Pacific Northwest Region, November 1988 (FEIS, appendix B).
b. Vegetation manipulation has been proposed to speed late-successional development of plantations by maintaining health and growth of trees and enhancing species and structural diversity (FEIS, pages 55 through 63).
c. Silvicultural practices include thinning plantations to maintain stand health and growth and enhance stand diversity. These practices are expected to benefit wildlife species (FEIS, pages 55 through 63).
d. No even-aged management is proposed. Stand treatments are limited to thinning with an objective to provide an understory comprising a variety of tree species different from those currently dominating the stands (FEIS, pages 55 to 63; appendix B).
e. Special attention has been given to riparian areas by promoting the development of large trees, maintaining existing shade and enhancing long-term shade, increasing future large woody debris for streams, and decommissioning roads. These actions are expected to

enhance water quality and improve fish habitat in the long term. (FEIS, chapter 4; appendix B).

f. The Project is consistent with the Aquatic Conservation Strategy objectives and includes measures such as best-management practices to protect, enhance, or minimize effects to soil and water resources (FEIS, pages 80 through 82; appendix B).
g. Management prescriptions for plantations have been designed to increase species and structural diversity of plant communities. These changes in plant communities are expected to increase the diversity of animal communities (FEIS, pages 55 through 68).

Help from Other Agencies and the Public

The formal process required by the National Environmental Policy Act (NEPA) for the Project began February 25, 1999, when the notice of intent was published in the Federal Register. Letters describing the actions considered in the Project were mailed on March 1, 1999, to more than 90 interested citizens, agencies, and organizations. News releases describing the proposed Project were published in local newspapers in the week of March 1. Comments on the proposal were due on March 19, though comments received later were also considered. Originally known as the Cascade-Green Project, the Project was included in all issues of the Siuslaw National Forest's quarterly news release called "Project Update" since the summer of 1998.

Substantive comments received from the public about the proposed Project and additional information obtained by the interdisciplinary team during scoping helped to determine the alternatives described in the draft environmental impact statement (DEIS). A notice of availability for the DEIS was published in the Federal Register on October 15, 1999. The public comment period for the DEIS officially began October 16 and ended December 30, 1999.

During the week of October 18-22, 1999, copies of the DEIS were distributed, and news releases in local papers announced its availability. Information included a website address where people could review the electronic version, which included maps. An additional news release was published in local papers during the week of December 6-10 to remind people that the comment period closed December 30, 1999.

The Forest received and analyzed about 260 substantive comments from 20 commenters. We met with some commenters to clarify and address their concerns and to help us develop our responses. I considered all the comments, and Forest Environmental Coordinator Craig Snider and District Ranger Doris Tai helped me determine which comments were substantive. These comments—and the information received after the DEIS was circulated—required some changes now incorporated into the FEIS.

Summary of responses to key comments that pertain to **actions connected to commercial thinning**:

Road decommissioning—Concerns about access were raised because of the proposal to decommission specific roads in the Five Rivers area, most notably Forest Service Road 32. The Forest can no longer maintain the large network of roads on the Forest, but the Forest's Access and Travel Management Guide is designed to ensure that critical links and access routes are

maintained. The Five Rivers Landscape Management Project's Record of Decision for actions not connected to commercial thinning (April 10, 2002) was appealed on June 4, 2002, partly because the appellant objected to road decommissioning. The appeal reviewing officer found that the Project FEIS fully displays the need for road decommissioning, fully discloses the resource and public effects of road decommissioning, and considered the comments on the Draft EIS; the Forest also completed the required Roads Analysis during the National Environmental Policy Act process. On June 24, 2002, the Deputy Regional Forester supported the Forest Supervisor's decision and denied the appellant's requested relief based on the decision documentation and the appeal reviewing officer's recommendation.

Landscape–scale design and site-specific analysis—The Five Rivers planning area is large--about 37,000 acres. Concern was raised about the Forest's ability to provide adequate, site-specific analysis for such a large area. Although the Five Rivers planning area is large, site-specific surveys were conducted. For example, stand-exam and survey-and-manage species surveys were completed for each stand, road and culvert inventories were conducted for each road, and stream surveys were implemented for affected streams. This level of analysis is the same as we use for planning smaller projects. For Five Rivers, I am convinced that the interdisciplinary team did a thorough site-specific analysis of the plantations, the roads, and the streams, as well as the functions and processes that tie them together.

Thinning vs. no thinning—The comment was raised that thinning is not necessary to achieve late-successional growth objectives; that is, that plantations will achieve old-growth characteristics naturally. Although this comment may be fundamentally true, some research shows that much that can be done to accelerate the natural processes. Old-growth conditions may be reached through multiple pathways. The Five Rivers study plan is designed to compare these different pathways.

Survey-and-manage species--Survey-and-manage and protection-buffer species were surveyed for the Project according to the protocols and management recommendations in effect at the time. One terrestrial mollusk species (*Prophysaon dubium*) and one fungus (*Otidea onotica*) were found in the Project area and their locations recorded. Recent revisions to survey-and-manage policy in the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA, USDI 2001) removed the mollusk from survey-and-manage and protection-buffer status in the project area and placed the fungus into survey-and-manage category F. Based on the annual species review in the Implementation of 2001 Survey-and-Manage Annual Species Review (USDA, USDI 2002), the fungus was removed from survey-and-manage status in June 2002. Thus, no protection of these recorded known sites is required in implementing the Project.

Alternative 1 is expected to maintain or increase the amount of suitable habitat for red tree voles.

Study plan—Another issue raised was that the study design may not be appropriate outside of an adaptive management area or across such a large landscape, and that the design structure may preclude actions recommended in the watershed analysis. Adaptive management--that is, learning and adapting from what we learn--is appropriate on all land allocations (Northwest

Forest Plan, standards and guidelines for implementation, page E-13). The study design merely structures our actions in such a way that we can learn from them (FEIS, appendix A).

Additional comments on the draft EIS and Forest Service responses can be found in the FEIS, appendix D.

Alternatives Considered

The interdisciplinary team developed and analyzed three alternatives. The action alternatives—Alternative 1 (environmentally preferable), with repaired roads; and Alternative 2, with no repaired roads—differ primarily in how many miles of unclassified roads are reopened or built and how many miles of system (classified) roads are repaired and stabilized. Alternative 3 is the no-action alternative.

Actions under Alternatives 1 and 2 incorporate the standards and guides established by the Siuslaw Forest Plan (1990), as amended by the Northwest Forest Plan (1994), and the design criteria—including mitigation measures and monitoring protocols—outlined in appendix B. A detailed management study plan is included in appendix A of the FEIS. Table R-2 includes a summary of proposed actions connected to commercial thinning and associated actions. The FEIS, pages 7 through 31, includes descriptions and comparisons of the three alternatives.

Table R-2. Summary of proposed actions under Alternatives 1 and 2

Management actions	Alternative 1	Alternative 2
Implement management study from appendix A	Yes	Yes
Designate 12 study areas	Yes	Yes
Commercially thin (acres), from appendix C		
Reserves	2,670	2,591
Matrix	560	530
Reopen roads (miles)		
System roads	6.7	0
Operator spurs	9.6	0
Build new temporary roads (miles)	1	0
Create snags in natural stands (number)	1,240	1,190
Create snags in plantations by inoculation (number)	10,700	10,400
Increase coarse wood in plantations (number)	25,000	24,700
Noncommercial thinning (acres)		
Reserves	1,588	1,588
Matrix	259	259
Plant conifers and hardwoods in plantations (acres)	1,600	1,550
Decommission roads (miles)	25	25
Maintain early-seral conditions (acres)	65	65

Environmentally Preferable Alternative

By law, the environmentally preferable alternative is to be identified in a record of decision. This alternative is not necessarily the one to be implemented, nor does it have to meet the underlying need for the project but only to cause the least damage to the biological and physical

environment and best protect, preserve, and enhance historical, cultural, and natural resources [Section 101 NEPA; 40 CFR 1505.2 (b)].

Alternatives 1 and 2 speed the development of late-successional-forest conditions in plantations by thinning, understory planting, and creating snags and coarse wood; enhance hydrologic function and water quality of streams by decommissioning roads; and include the management study to increase knowledge about how to speed developing late-successional conditions and to improve streams.

The primary environmental difference between Alternatives 1 and 2 is how they maintain and restore watershed function as described for the nine aquatic conservation strategy objectives of the Northwest Forest Plan:

- Based on the project design criteria (appendix B), project activities under Alternative 1 will not retard or prevent attainment of any of the strategy's objectives in the short term. Alternative 1 would repair current and future road-failure sites and stabilize the areas behind them. These actions will maintain and restore watershed function in the long term by eliminating the potential for streams to be diverted from their channels or for catastrophic road-fill failure and by providing avenues for large-wood delivery to streams from debris flows originating above roads.

- In the short term, Alternative 2 would avoid potentially causing fine sediment to enter streams by not repairing, reopening, or building roads. However, by not repairing current and future road-failure sites, Alternative 2 would increase the risk for sediment entering streams. Thus, in areas affected by these sites, Alternative 2 will likely retard or prevent the attainment of the strategy's objectives in the long term.

Because the aquatic conservation strategy objectives have a long-term focus, Alternative 1 is more environmentally preferable than Alternative 2. All practicable means to avoid or minimize environmental harm from the selected alternative will be used (appendix B).

Alternative 3 is not environmentally preferable because it proposes no actions to speed developing late-successional-forest conditions or enhance hydrologic function and water quality of streams, and it does not include the study. Alternative 3 would not maintain and restore watershed function as described under the aquatic conservation strategy objectives

Requirements of Laws and Past Decisions

Forest Plan

The Siuslaw National Forest Land and Resource Management Plan, as amended by the Northwest Forest Plan (1994); the Lobster-Five Rivers Watershed Analysis (1997); and the Late-Successional Reserve Assessment, Oregon Coast Province-Southern Portion (1997) provided the context for developing the alternatives. The selected alternative complies with all aspects of the Forest Plan, including being consistent with the Aquatic Conservation Strategy objectives (FEIS, pages 80, 81, and 82).

Federal laws

The Antiquities Act of 1906, the National Historic Preservation Act of 1966 (as amended 1999), the Archaeological and Historical Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979: The Project team identified no heritage resources (historical and archaeological sites) likely to be affected (FEIS, pages 54, 72, 79, and 85). Areas most likely to have such resources are on gentle slopes adjacent to streams. The Project is not expected to affect these resources. Actions related to plantation and road management are generally on lands previously disturbed by logging and road building and will not require surveys based on our Regional Programmatic Agreement (1995) with Oregon's State Historic Preservation Office. Should any heritage resources be discovered, sites will be avoided or treated in accordance with federal laws. Heritage survey reporting will follow established guidelines set forth in our agreement with the State Office.

National Environmental Policy Act (NEPA), 1969: The Act establishes the process, format, and content requirements for conducting and documenting environmental analyses. Efforts leading to and including the preparation of the Project's FEIS comply with these requirements.

Endangered Species Act, 1973: A biological assessment (Biological Assessment for the Five Rivers Landscape Management Project Which Would Modify the Habitats or Which May Disturb During Nesting Periods, Bald Eagles, Northern Spotted Owls, or Marbled Murrelets, August 31, 2000) has been prepared to document possible effects of proposed actions on endangered and threatened species in the Five Rivers Project area.

In their biological opinion of March 27, 2002, the U.S. Fish and Wildlife Service states that Project actions "are not likely to jeopardize the continued existence of the bald eagle, spotted owl, or the marbled murrelet because the potential habitat impacts are relatively minor and disturbance impacts will be sufficiently dispersed over time and space. In addition, these proposed actions are not likely to destroy or adversely modify spotted owl or murrelet critical habitat". All reasonable and prudent measures, and all mandatory terms and conditions described in the biological opinion, are incorporated in the Project design criteria (appendix B).

In their biological opinion dated July 23, 1999 (OSB1999-0088) and their essential fish habitat consultation letter dated February 9, 2001 (OSB1999-0088-EFH), the National Marine Fisheries Service has determined that incidental take of Oregon Coast coho salmon from commercial thinning and connected actions has been adequately minimized by project design. Thus, the National Marine Fisheries Service determined that no reasonable and prudent measures, in addition to project requirements, are necessary for these actions. The National Marine Fisheries Service concludes that the Project is not likely to jeopardize the continued existence of Oregon Coast coho salmon.

In response to a court-ordered injunction issued December 7, 2000 in Pacific Coast Federation of Fishermen's Assn. v. NMFS, CV00-175R (W.D. Wash.), the National Marine Fisheries Service, on January 9, 2001, suspended certain biological opinions at issue in that case as they pertained to timber sales, including OSB1999-0088 that covered the Five Rivers Landscape Management Project. NMFS subsequently entered into a stipulation in that case that allowed certain timber

sales, including the sales associated with the Five Rivers Landscape Management Project, to proceed; thus, on April 1, 2003, the same court ordered, in part, that the Five Rivers Landscape Management Project sales could proceed, based on its existing biological opinion OSB1999-0088.

National Forest Management Act (NFMA), 1976: The selected alternative was developed to comply with NFMA implementing regulations.

Clean Air Act Amendments, 1977: The selected alternative is designed to meet the national ambient air quality standards by avoiding practices that degrade air quality below health and visibility standards. The Oregon Smoke Management Plan and Oregon State Implementation Plan will be followed to meet the Clean Air Act requirements.

Clean Water Act, 1982: The selected alternative will meet and conform to the Clean Water Act, which establishes a nondegradation policy for all federally proposed projects (appendix B, page B-2). The selected alternative meets antidegradation standards agreed to by the state of Oregon and the Forest Service, Region 6, in a memorandum of understanding (Forest Service Manual 1561.5). These standards will be met through planning, applying, and monitoring best-management practices. Site-specific best-management practices designed to protect beneficial uses are included in appendix B.

Other federal laws: The Project is not expected to have significant adverse effects on heritage (cultural) resources, consumers, civil rights, minority groups, or women. American Indian rights, including those conferred by the American Indian Religious Freedom Act, will not be affected. All Tribes that could be affected by the Project were consulted. Alternative 1 has no unusual energy requirements. The FEIS adequately documents how compliance with these requirements is achieved.

Health and safety

Oregon State Forest Worker Safety Codes: The Oregon Occupational Safety and Health Code for Forest Activities will be met in implementing the selected alternative.

Past decisions

The Five Rivers Landscape Management Project FEIS is tiered to the Siuslaw Forest Plan (1990), as amended by the Northwest Forest Plan (1994).

The Project will incorporate all measures contained in the FEIS for managing competing and unwanted vegetation, November 1988; the record of decision signed December 8, 1988; and the requirements of the mediated agreement that was signed May 24, 1989, by the USFS, NCAP, OFS, et al. Prevention will be the main strategy for managing unwanted and competing vegetation. Specifics for managing unwanted and competing vegetation are documented in appendix B, the silvicultural prescription (a project-file document), and the vegetation management analysis (a project-file document) for this Project.

The Forest completed a biological evaluation of potential effects to sensitive species identified by the Regional Forester. It determined that, though some individual sensitive species may be affected, the effects are not likely to contribute to a trend towards federal listing or loss of viability of the population or species (FEIS, pages 67, 68, and 80).

Implementation

Implementation of this project may not proceed until five (5) working days after the close of the 45-day appeal filing period. Activities, including service contract preparation and solicitation of bids, may proceed immediately. Most actions would be completed in 10 to 15 years, with most commercial timber-sale contracts awarded in the first 5 years.

Administrative Review and Appeal

My decision is subject to appeal pursuant to 36 CFR 215. Any written notice of appeal of this decision must be fully consistent with 36 CFR 215.14 (Content of a Notice of Appeal) and must include the reasons for appeal.

The notice of appeal must be filed within 45 days of the date legal notice of this decision appears in the Corvallis Gazette-Times, Corvallis, Oregon. The notice of appeal must include sufficient narrative evidence and argument to show why this decision should be changed or reversed. A written notice of appeal must be filed in duplicate with:

> Linda Goodman, Regional Forester, Pacific Northwest Region, USDA Forest Service, ATTN: 1570 Appeals, P.O. Box 3623, Portland, OR 97208-3623

I encourage anyone concerned with my decision on the Project to contact the Waldport Ranger District before submitting an appeal. Together, we might resolve the concern or misunderstanding less formally than through formal appeal.

Contacts

For additional information about the specific activities authorized by my decision, contact Paul Thomas, Planning Manager, or Bruce Buckley, Resource Planner at (541) 563-3211; or through the internet at pgthomas@fs.fed.us; or bbuckley@fs.fed.us; or by mail at P.O. Box 400, Waldport, OR 97394.

_____ _____

GLORIA D. BROWN
Forest Supervisor
Siuslaw National Forest
USDA Forest Service

Date

Appendix A

Five Rivers Landscape ~Record of Decision

Excerpted from Appendix A of the Five Rivers Landscape Final Environmental Impact Statement

Table A-3. Road monitoring: Initial conditions and relative effects on roadsheds with different management pathways

Initial conditions and effects	Primary monitoring (units), assured as part of the management study	Secondary monitoring (units), not part of the management study[a]
Pre-installation road conditions		
Road location and type	Measure the location, number, type, and condition of all roadshed roads.	
Road density	Calculate using the GIS data base (miles/roadshed per acre)	
Culverts	Measure the location, number, and condition of each stream-crossing culvert in the roadsheds (culverts/roadshed).	Calculate stream densities, using Jones et al. 1999 (miles/roadshed per acre by stream type).
Pathway-related road effects		
Vehicle access and road traffic	Sample representative project-maintained roads to estimate resident, recreational, and project use to compare pathways and evaluate if road objectives were met (vehicle entries/roadshed per year).	Study road use by monitoring all vehicle traffic and handing out questionnaires (entries/roadshed per year).
Road maintenance costs	Monitor and record all road-maintenance actions and costs into the GIS-based database ($/mile per roadshed by action type) associated with pathway, resident, recreational, and project use.	Study the costs and benefits of integrated stand and road management.
Blockages of debris above culverts, road-related erosion, slope failures, waterbars, and hydrological effects	Survey roads after large storms (using the Forest's flood emergency maintenance plan) on ATM and pathway roads or, at a minimum, every 2 years. Monitor high-risk failure sites, waterbars, and rate of vegetation development. (volume of debris/roadshed and volume/mile of road; slides/roadshed; see Jones et al. 1999).	Study stream temperature effects above and below blockages (temperature).
Access issues	Monitor how road closures limit research and monitoring and responses to insect outbreaks and windthrows.	Study positive and negative effects of access on late-successional and aquatic conservation objectives.
Disturbance to wildlife		Study links between management and wildlife behavior (for example, changes in monitored activity of radio-collared owls).
Vectors for invasive weeds		Study weed ecology as affected by road and plantation management (species, individuals per mile of road)
Community approval	Monitor; record comments into the data base.	Survey local, regional, and possibly national opinions on road and plantation management strategies.
Recreation		Study hiking, hunting, and other uses.
Road succession	Monitor plant succession on closed roads.	Study microclimate changes on closed roads.

[a] To be conducted by managers, researchers, or volunteers if funding is available.

Table A-4. Forest monitoring: Initial conditions and relative effects on roadsheds with different management pathways

Initial conditions and effects	Primary monitoring (units), assured as part of the management study	Secondary monitoring (units), not part of the management study[a]
Pre-installation conditions		
Tree and stand characteristics in plantations	Start by establishing permanent stand-exam plots on 10 to 15% of the plantation units, randomly selected from the roadsheds (about 125 of the 1,500 completed stand exams). Compare stand averages (previous and permanent exams), and add more permanent plots as needed. Measure by species and canopy strata: trees/acre, DBH, dominants' height, basal area, live-crown ratio, and woody debris (various units).	Predict how stands will change though time with ORGANON, CLAMS, and other available models.
Natural stands (mature forest)	Establish permanent plots on 5 stands or more or use the continuous vegetation survey plots in mature stands to monitor the same variables as in plantations (various units).	
Owl-dispersal habitat	Evaluate "dispersal habitat" (especially acres/roadshed with canopy cover <40%).	
Pathway-related stand-development effects		
Growth of prospective old-growth trees in plantations	Monitor trajectory of dominant trees in plantations (slope of the line of average DBH of the 10 largest trees/acre per year) and predict the date when old-growth habitat will be reached (year/roadshed). Monitor permanent plots in plantations 5 years after thinning and every 10 years thereafter.	Study the relative effects of different understory species, established in openings, on growth of residual Douglas-fir trees.
Coarse woody debris	Monitor permanent plots for decomposition-class changes every 10 years.	Study effects of grouped versus dispersed small logs, decomposition and succession on woody debris, and bark-beetle responses to woody debris.
Species	Monitor permanent plots for changes in plant species (planted and naturally regenerated) every 10 years; track owls and murrelets.	Study old-growth-associated species (such as, *Lobaria*, amphibians, small mammals) and early-succession-related species (elk, deer, bears).
Owl-dispersal habitat	Monitor permanent plots for how fast crown cover is restored after thinning (% crown cover/year).	Study actual owl and owl-predator behavior in thinned and unthinned stands.
Forest management costs	Total all costs associated with management ($/roadshed).	Study the costs and benefits of integrated stand and road management.
Mature forest	Monitor permanent plots for changes in mature stands and evaluate their development toward late-successional and aquatic conservation goals.	Study possible management of mature stands to speed development of old-growth or aquatic habitat.
Social perceptions		Conduct surveys of people walking interpretive trails built into each of the three pathways.

[a] To be conducted by managers, researchers, or volunteers if funding is available.

Table A-5. Monitoring stream and riparian management, disturbance, and learning

Initial conditions and effects	Primary monitoring (units), assured as part of the management study	Secondary monitoring (units), not part of the management study[ϕ]
Pathway-related stream, riparian, and water-quality effects		
Stream shade	Monitor effects and duration on stream shade before and after thinning.	
Sediment budgets		Study sediment stores as a way to understand changes in sediment and logs over time.
Fish habitat	Monitor changes in pools, riffles, large woody debris, using the method of Hankin and Reeves (1988).	
Fish populations	Monitor population size and species composition, using a level II survey by OR Department of Fish and Wildlife.	
Disturbance effects and interactions		
Landslides	Analyze available aerial photos (every 5 years or less) for large landslides, document them on the ground, and compare them to predicted danger class and proximity to stand and road management.	Study and model the interactions of topography, road management, and thinning intensity.
Windthrow	Analyze available aerial photos (every 5 years or less) for large windthrows, document on the ground, and compare to predicted exposure (Kramer, in press) and proximity to stand and road management.	Study and model the interactions of exposure to storms, stand density, time since thinning, thinning intensity, and soil conditions.
Insects and diseases	Analyze available aerial photos (every 5 years or less) for Swiss needlecast, root rot, bark beetles, and other possible agents and document on the ground.	Study insect and disease agents and their interactions with windthrow, thinning, snags, and coarse woody debris
Fire	Monitor fuel conditions.	Model fire potential and road-closure effects.
Large-scale habitat		Study effects of edge density (based on size, location, and seral-stage classes from the wildlife guide) on actual habitat use.
Institutional learning		
Integrated landscape planning with learning objectives and a more concise format	Monitor how well the landscape planning, learning objectives, and format are accepted, if lawsuits are filed, and cases where the plan concepts were used in other projects.	Evaluate the effectiveness of including learning objectives in the NEPA process, compare environmental assessments required for all actions proposed under the EIS, and document new resource interactions otherwise ignored.
More effective researcher-manager collaboration	Monitor the number of research studies applied in Five Rivers.	Evaluate how science knowledge was applied and whether both management and science missions were simultaneously met with this new approach.

[a] To be conducted by managers, researchers, or volunteers if funding is available

Appendix B

Project Design Criteria

These design criteria for the Five Rivers Landscape Management Project were developed to ensure that standards and guides of the 1990 Siuslaw Forest Plan (SFP) as amended by the 1994 Northwest Forest Plan (NFP) are met. Where applicable, pertinent standards and guides from these Plans are cited. The design criteria apply to Alternatives 1 and 2, unless otherwise specified. Appropriate specialists will be consulted before any design criteria for proposed activities are changed.

I. Design Criteria Common to All Activities

1. Coho salmon

a. Reduce the density or adverse effects of existing system or nonsystem roads in the Lobster-Five Rivers Watershed by at least an equivalent mileage or adverse effect of proposed new permanent roads. Roads to be decommissioned or effects to be reduced will be identified before or at the same time new permanent roads are built.

b. Reduce the density or adverse effects of existing system or nonsystem roads in the Lobster-Five Rivers Watershed by at least an equivalent mileage or adverse effect of temporary roads not decommissioned in the same dry season they are built. Roads to be decommissioned or effects to be reduced will be identified before or at the same time new temporary roads to remain for more than one dry season are built. Roads to be decommissioned that serve a sale unit may be decommissioned up to five years after the sale closes. The National Marine Fisheries Service has identified any temporary road not built, used, and decommissioned in the same dry season (July 1- September 15) as a semipermanent road.

2. Northern spotted owl and marbled murrelet habitat

a. Comply with the standards of the 13 May 1997 biological opinion addressing the effects of implementing the Northwest Plan standards and guides on designated murrelet critical habitat (USDI 1996) for all thinning and individual hazard-tree removals that may affect critical habitat or suitable habitat of the marbled murrelet.

b. Except for hazard trees, do not remove individual known nest trees or trees with nesting structure from areas where, in the opinion of the unit biologist, the loss of such a tree would limit nesting. A known nest tree may be removed only when it is a hazard tree **and** when the tree is unoccupied by nesting birds or young.

c. For all projects affecting listed species, include a wildlife biologist in their planning and design.

3. Bald eagle, northern spotted owl, and marbled murrelet disturbance

Pending final terms and conditions issued by the U.S. Fish and Wildlife Service, implement the following criteria:

a. Do not implement any project within 0.25 miles or a 0.5-mile sight-distance of a known bald eagle nest site between January 1 and August 31.

b. Do not treat any area within 0.25 miles of a spotted owl nest site or activity center of any known pair, or within 0.25 miles of an occupied murrelet site, during the critical nesting period. The distance and timing may be modified by the unit wildlife biologist, based on site-specific information, but all changes must be appropriately documented and the Fish and Wildlife Service notified before they are implemented.

c. Do not begin activities associated with projects within 0.25 miles of occupied or unsurveyed suitable marbled murrelet habitat between April 1 and September 15 until two hours after sunrise; end activities two hours before sunset.

d. Do not use blasting for part of any proposed action from March 1 through September 30.

e. Restrict helicopter operations to August 6 through February 28 to reduce potential disturbance to listed species such as the northern spotted owl and the marbled murrelet.

4. Other requirements

a. Follow Siuslaw Plan standards and guides (FW-114 through FW-118) to meet water-quality standards outlined in the Clean Water Act for protecting Oregon waters, and apply practices as described in General Water Quality Best Management Practices, Pacific Northwest Region, November 1988. Design criteria, including these practices, are incorporated throughout the project, such as in project location, design, contract language, implementation, and monitoring. The State has agreed that compliance with these practices will ensure compliance with State Water Quality Standards (Forest Service Manual 1561.5, R-6 Supplement 1500-90-12).

b. For projects requiring heavy equipment, develop a spill plan and assure materials will be available to prevent and control the entry of fuel, hydraulic oil, or other chemicals into streams. Have a "spill response kit" on the project whenever equipment is operating; it must be sufficient to absorb 34 gallons of oil, designed to float on the surface, while absorbing oil and repelling water. The kit will meet or exceed the physical properties of a "New Pig Products Spill Kit #408" (SFP: FW-119, 120, 122).

c. The literature was searched for the project planning area for possible heritage resources (historical or archaeological sites). No known sites were identified that could be affected by this project. In accordance with the Siuslaw National Forest's 1995 Programmatic Agreement with the State Historic Preservation Office (SHPO), conduct field inventories by certified heritage technicians and receive concurrence from the State Office after project

design, but before the two actions are implemented on previously undisturbed ground. These actions include building new road to access private land in the Green River subwatershed and placing large wood in streams. Riparian planting will not be allowed in areas identified as homestead building sites. Other actions will all be on previously disturbed ground and will not require field inventories. Should any heritage resources be discovered as a result of any project activities, the site will be preserved or treated in accordance with the National Historic Preservation Act.

d. Follow the Vegetation Management Analysis to guide the managing of competing and unwanted vegetation. The plan was developed in compliance with the Record of Decision for the "Managing Competing and Unwanted Vegetation" FEIS (November 1988) and the subsequent Mediated Agreement.

II. Commercial Thinning and Postharvest Activities

1. Thin and harvest operations

Proposed, Endangered, Threatened, and Sensitive (PETS) Species:

a. Base thinning prescriptions in the late-successional reserves on the management triggers, criteria, and appropriate activities outlined in table 7 of the Late-Successional Reserve Assessment, Oregon Coast Province-Southern Portion (USDA 1997).

b. Do not fall individual trees exceeding 20 inches dbh except to create openings, provide other habitat structure such as downed logs, reduce spread of laminated root rot, eliminate safety hazard from a standing tree, or in cutting minimal yarding corridors. Where trees larger than 20 inches dbh are felled, they will be left in place to contribute toward meeting the coarse woody debris objective.

c. Units proposed for heavy thinning (30 to 40% minimum average canopy cover) are estimated to comprise 12% of all commercial thinning. In this thinning regime, base time frames and corresponding thinning areas (in percent acres) accordingly: October 1 - February 28, 8%; March 1- June 30, 0%; July 1 - August 5, 12%; August 6 - September 30, 80%.

d. Units proposed for light-to-moderate thinning (40% or greater minimum average canopy cover) are estimated to comprise 88% of all commercial thinning. In this thinning regime, base time frames and corresponding thinning areas (in percent acres) accordingly: October 1 - February 28, 22%; March 1- June 30, 5%; July 1 - August 5, 38%; August 6 - September 30, 35%.

e. Add provisions (such as CT6.25 and CT9.52) to contracts to protect any of these species that may be discovered when the project is implemented. The Forest wildlife biologist will determine the need for reinitiating consultation with the U.S. Fish and Wildlife Service, and the Forest fish biologist will determine the need for reinitiating consultation with the National Marine Fisheries Service (SFP: FW-035, 037).

f. Include applicable hourly and seasonal operating restrictions in the contract.

g. Provide a minimal 100-foot buffer to protect the loose-flowered bluegrass *Poa laxiflora* conservation-strategy population (#44) adjacent to the bottom of unit 305 from harvest operations. Consult with the Forest botanist before sale layout for assistance in locating the unit boundary.

Survey and Manage Species:

a. Conduct surveys before contracts are awarded or work begins. Because the survey-and-manage species list and survey protocols change over time (for example, new information is being developed by species specialists), review the species list and survey protocols before conducting surveys.

b. Follow current management recommendations for known sites of survey and manage species.

c. As a minimum starting point in developing protection buffers for terrestrial mollusks, use the following: buffer radius, rounded up to the nearest five feet = 2(average stand height) X (pretreatment % canopy - posttreatment % canopy)/pretreatment % canopy. Considering microsite conditions (slope, aspect, microclimate), adjust buffer up to 30% to protect key habitat features, such as deciduous trees, accumulations of coarse wood, and shade.

Stand and Species Diversity (NFP: p. C-12):

a. Emphasize variable spacing in distributing leave trees to mimic natural stands.

b. Retain western hemlock, western redcedar, Pacific yew, and native hardwoods in stands, to maintain existing species diversity. Buffer wet areas, hardwood clumps, and other unique features to maintain existing stand diversity.

c. Retain trees with unique phenotypical differences (such as large limbs) compared to the rest of the stand for future wildlife habitat. Up to 5% of the trees are expected to be in this category.

d. After retaining trees identified in “b” and “c” above, favor the largest, healthiest trees in selecting leave trees.

e. In the thinning stands in pathway B, retain 30 to 40% canopy cover (40 trees/acre) except within ¼ mile of known northern spotted owl or marbled murrelet sites, where the canopy cover will be kept above 40%. All heavily thinned stands must retain a canopy cover greater than 30%.

Snags (NFP: 2; p. C-14):

a. Where safe and feasible, retain existing snags that provide suitable wildlife habitat.

Soils and Aquatic Resources (NFP: p. B-11, 8, 9; p. C-15; TM-1, p. C-31, 32; RA-1 & 2; FW-1, p. C-37):

Streams and Riparian Vegetation

a. Implement protective vegetation leave areas or buffers around all streams, potentially unstable areas, and wet sites to maintain stream temperature, maintain stream-adjacent slope stability (including headwalls), and protect riparian vegetation. These areas will not be harvested.

b. Determine width of buffers based on site-specific factors such as stream order, presence or absence of conifers, and slope-stability conditions. Buffers will generally include the inner gorge adjacent to streams, the active flood plain, and one or two conifer rows above the slope break (SFP: FW-087, -088, -089, -112).

c. Limit skyline corridors to between 10 and 15 feet wide. Where skyline corridors pass through riparian buffers, remove no more than 20% of the canopy in a given 1,000-foot reach of stream (SFP: FW-091).

d. Directionally fell trees away from buffers to protect riparian vegetation from damage. Trees accidentally felled into buffers may be removed if stream sedimentation or damage to riparian vegetation can be avoided (SFP: FW-091).

e. Locate post-harvest canopy openings farther than 200 feet from flood plains and stream valley floors to maintain conifer in the stream-influence zone.

f. To reduce sedimentation from aggregate-surfaced roads during wet weather, apply mitigating actions such as requiring “constant reduced tire pressure” (tires are inflated to the tire manufacturer’s recommended minimum pressure), avoiding blading of ditches, monitoring roads during periods of heavy rain, and using straw bales to trap sediment where needed to log haul routes.

g. To minimize soil disturbance, use standing skyline cable or aerial logging systems for all thinning sales. Ground-based logging systems such as harvesters may be used if they operate from roads.

h. Where cable yarding is planned, design logging systems to yard away from stream channels to minimize soil disturbance on stream-adjacent slopes. If this strategy is not feasible, maintain full suspension of logs over streams (SFP: FW-091, -092).

Soils and Woody Debris

a. Do not use whole-tree yarding unless it's agreed to by an interdisciplinary team. Decisions on whether to implement whole-tree yarding will be made case by case.

b. Retain existing logs in stands to benefit soil nutrient cycling; moss, fungi, and lichen habitat; travel corridors for small mammals; and foraging sites for various animal species.

c. Retain limbs and tops in stands on sites where little or no ground vegetation exists to reduce potential for soil erosion and enhance soil nutrient cycling.

d. Where applicable to reduce potential for theft of dead and down structural material, close roads as soon as possible after harvest.

e. Outside of areas designated for full log suspension and lateral yarding, use one-end log suspension on all areas designated for cable yarding systems to reduce soil displacement and compaction (SFP: FW-107).

f. Where slopes are greater than 60% immediately below side-cast roads or roads to be decommissioned, retain two rows of conifers (where feasible) to maintain slope stability (SFP: FW-112).

Temporary (Nonsystem) Roads and Landings (NFP: RF-2 & 5, p. C-32, C-33):

a. A team comprising planners and engineers will review road project sites before preparing road design plans for timber sale contracts. Planners and engineers will review any changes in design plans before incorporating them into contracts.

b. Do not reuse existing temporary roads where road stability is a major concern.

c. Limit new temporary spur roads to stable ridges to minimize soil disturbance. No new permanent system roads will be built. Where operationally and economically feasible, design logging systems to minimize the need for new temporary roads (SFP: FW-162, 163).

d. Do not designate temporary roads (new or reopen) or system roads as specified construction or reconstruction unless recommended by an interdisciplinary team and approved by the line officer.

e. If the horizontal alignment of temporarily reopened roads needs adjustment, favor the cut bank side of the road prism to minimize disturbance to side-cast areas and established vegetation.

f. Scatter slash created through road building in the stands.

g. Surface temporary roads used during the wet season with rock aggregate where needed. Surfacing depth should allow for log trucks using constant reduced tire pressures. Consider the length of temporary roads when determining the season of use.

h. Build skyline cable and helicopter service landings in stable areas with stable cut bank slopes. Use existing landings where feasible (SFP: FW-115, 117).

i. Water bar and close temporary roads between operating seasons or as soon as the need for the road ceases, to minimize sedimentation from roads. Spread landing slash by machine over landing sites (unless tree planting is planned) and spur roads. Seed remaining exposed soils with native species (if available). This practice will be more cost effective than machine piling and burning of landing piles and will help to stabilize disturbed soils (SFP: FW-162).

j. Evaluate temporary roads used for timber removal (especially those used during the wet season) to determine whether roads need to be decompacted. Evaluations will be made by a watershed specialist (such as a hydrologist, soil scientist, or geologist) to determine need for and type of (ripping or subsoiling) treatment. Through agreement, ripping can be done by the timber-sale operator. Avoid subsoiling in areas where residual tree roots may be adversely affected.

k. Do not locate helicopter service landings near streams to minimize potential for petroleum spills affecting water quality.

l. Because the number of large helicopter log-landing sites is insufficient, use existing roads as log drop zones for helicopter logging by small ships such as the K-Max and the Bell 204. Design log drop zones to allow workers to be at least 1.5 times the length of the longest log from drop zones. Place landings to within 0.5 miles from units. Design landings to allow the loader to swing logs, and be level enough to allow for accurate monitoring of loaded truck weight.

Existing System Roads (NFP: RF-2 & 5, p. C-32, C-33):

a. Where water bars are temporarily removed from project-maintained roads to facilitate harvest operations, add rock if needed at these sites to maintain a hardened road surface and reduce the potential for erosion.

b. Replace water bars and close project-maintained roads when they are no longer needed. Appropriate closure devices generally include earthen mounds or large boulders. Purchasers will be responsible for replacing closure devices that were removed for harvest operations.

Insects, Disease, and Wind (NFP: p. C-12, C-13)

a. For stands considered vulnerable to storm winds, implement untreated “wind buffer” areas.

b. Follow the silviculture prescription guidelines when marking around laminated-root-rot areas.

c. To help document possible pockets of laminated root rot, include "Treatment of Stumps" (CT6.412) in the timber sale contract.

2. Post-harvest "Essential" KV activities

These treatments focus on incorporating management elements for understory planting in commercially thinned units. Refer to the Silviculture Prescription in the project file for unit-specific information.

Stand and Species Diversity (NFP: p. C-12):

a. Underplant pathway B acres where residual trees approximate 40 tpa. These acres are the highest priority for underplanting.

b. Plant about 3 to 5% of thinned and harvested acres in natural or created openings of from one-half to one acre.

c. Underplant shade-tolerant conifers (western hemlock and western redcedar) and hardwoods (red alder, Oregon big-leaf maple, cascara, and other native hardwoods). If necessary, fell conifer trees required for coarse woody debris to provide more light.

d. Implement animal control measures such as tubing or capping to benefit tree survival and growth.

e. Release planted trees from red alder or brush as needed for up to 10 years after the sale is closed to benefit tree survival and growth.

3. Post-harvest mitigation activities

These treatments focus on incorporating management elements for fire and fuels, coarse woody debris, snags and wildlife trees, stand and species diversity, and noxious weeds. Each commercially thinned unit, regardless of the sale contract used, must meet the payment to counties, roads and trails, and collect KV funds for its allotment of snag and coarse woody debris mitigation before any collections for the salvage sale fund.

Fire and Fuel Management :

a. Follow Fire Management Plan for LSR RO268 for all wildfire suppression or presuppression prevention programs. Treat all fuels (logging residue) according to the guidelines of the Oregon Smoke Management Plan.

b. Design fuel treatment activities to meet Aquatic Conservation Strategy objectives and to minimize disturbance to riparian vegetation. Refer to the Northwest Forest Plan (FM-1, 3, 4, 5; pp. C-35, 36) for additional information.

c. Where fuel borders county roads and system roads maintained open for general use, provide fuel breaks to reduce the risk of human-caused fire. Measure fuel breaks from the edge of the road into the thinned units. System roads such as 32, 3210, 3225, 3250, 3259, 3505, 3510, 37, 3705, and 58 will require a minimum 25-foot fuel break for each side of the road bordered by fuel (about 40 acres total).

d. Create fuel breaks by (in the order of least to most expensive cost) leaving untreated buffers adjacent to roads, directional felling of trees away from roads, underburning adjacent to roads, and hand piling and burning slash adjacent to roads. High cut banks (with no slash) can be considered adequate fuel breaks.

e. If scattering of landing piles will not adequately address the fire hazard, burn landing slash within 25 feet of open system roads.

f. Where practical, close project-maintained system roads (roads kept open only for the duration of the commercial thinning project) to vehicle traffic during the dry season where landing piles and other logging slash borders these roads. Determine case-by-case if road closure alone will adequately address the fire hazard. If these roads are to be kept open during the dry season, consider reducing the fuel loading through prescribed burning to address the fire hazard.

g. After harvest operations are completed on any given unit, conduct fuel treatments where necessary and as soon as practical to minimize exposure to fire hazard.

h. To reduce the potential for fire spread and the difficulty in controlling it, place coarse woody debris in small pockets of heavier concentration rather than scattering it more evenly across units. Where large amounts of coarse wood will be created or where thinned units are close to each other, place heavier concentrations of coarse wood on north slopes and lower 1/3 slopes.

i. To reduce the potential for wildfire, do not fell trees for coarse woody debris in designated fuel breaks unless the tops are kept outside of the breaks.

Coarse Woody Debris Mitigation (NFP: 8, 9; p. C-15; C-12 & 13):

a. Provide coarse woody debris by using the following prescriptions based on the Late-Successional Reserve Assessment, Oregon Coast Province, Southern Portion (R0268), version 1.3, p. 66-69: pathway A plantations--Alternative 4; pathway B plantations--Alternatives 2 and 3; pathway C plantations--Alternative 3; plantations outside pathways and in late-successional reserve--Alternative 3.

b. Maintain these trees-per-acre (tpa) prescriptions for coarse woody debris: pathway 3B, 30 tpa; pathways 5B, 7B, and 8B, 15 tpa; pathway C, 5 tpa; plantations outside pathways and in LSR, 5 tpa; and 0 tpa in plantations outside of pathways and LSR.

c. Defer creating coarse wood in pathway B units until five years after the sale contract is closed to allow for canopy recovery. At that time, monitor the canopy cover before the trees are felled to ensure canopy cover remains at or above the 30 to 40% range.

c. Use trees that blow down within 5 years after harvest towards meeting the woody debris allotment.

d. Fell trees for woody debris in areas that would enhance density variability within stands.

e. To reduce the potential for Douglas-fir bark beetle infestations, fell trees to provide woody debris outside of the adult beetle flight season (May through June 15).

Creating Snag and Wildlife Trees (NFP: 2; p. C-14):

a. To mitigate for past losses of mature snags, top mature trees or inoculate them with native fungi (*Phellinus pini* and *Fomitopsis canjanderi*) in natural stands adjacent to commercially thinned managed stands. Top or inoculate about 1,240 trees to ensure subwatersheds contain at least 1.4 snags/acre or 10% above their existing number.

b. In thinned portions of plantations, inoculate about 6,500 (including 20% mitigation for past harvest practices) trees with native fungi (*Phellinus pini* and *Fomitopsis cajanderi*) to ensure subwatersheds average 2.4 snags/acre. Inoculation will allow for continued tree growth and increase snag diameter while providing cavity habitat. Inoculation numbers are based on the net acres of managed stands commercially thinned.

c. Do not create snags and wildlife trees through tree topping between March 1 and September 30, to avoid potential disturbance to spotted owls and murrelets.

d. Do not cut trees that appear to contain red tree vole or raptor nests.

e. Do not create snags where they appear likely to fall over or slide into public-traveled roads, to avoid increasing hazardous conditions in the range of the roadway and theft of snag material for firewood.

Noxious Weed Prevention and Mitigation:

a. To prevent the spread of noxious and undesirable weeds, maintain canopy cover to the extent possible when reopening and building roads or stabilizing and closing them. Seed disturbed sites lacking canopy cover (landings and roads) with available native grass and forb species.

b. To prevent spread of noxious weeds, include provision "Cleaning of Equipment", C6.343 (Option 2) in the timber sale contract for all ground-based equipment associated with logging operations.

c. Develop noxious weed treatment prescriptions for harvested units and their adjacent areas from information obtained from previous monitoring. Limit treatments to manual, mechanical, and biological methods (including additional seeding). The funding source for treatments will be KV mitigation collections.

Original Logging-Spur-Road Stabilization (Original Logging Roads Not Used for Commercial Thinning Operations):

a. Where warranted, place existing logging spurs not used for thin and harvest operations but within ¼-mile of commercial thinning units in the KV plan to become eligible for KV funds. Use these funds (if available) to hydrologically stabilize the roads, where warranted. If KV funds are not available, another funding source will need to be identified.

b. Generally apply road-decommissioning design criteria to these roads.

c. Where log culverts were used, retain logs in streams.

d. Remove failing sidecast material where the potential for material entering streams is moderate to high.

4. Post-harvest enhancement activities

Stand and Species Diversity (NFP: p. C-12):

a. Plant shade-tolerant conifers (western hemlock and western redcedar) and hardwoods (red alder, Oregon big-leaf maple, cascara, and other native hardwoods) in suitable areas outside of those required for essential KV. If necessary, fell additional trees to provide more light. Felled trees will contribute toward the downed wood requirement.

b. Plant hardwoods (and possibly western redcedar) in root-rot-infested patches to reduce effects of the disease.

c. Use animal control measures such as tubing or capping to benefit survival and growth rates of planted trees.

d. Release planted trees from alder and brush as needed for up to 5 years after the sale is closed to benefit survival and growth.

Creating Snag and Wildlife Trees (NFP: 2; p. C-14):

a. In unthinned portions of plantations, inoculate about 4,200 trees with native fungi (*Phellinus pini* and *Fomitopsis cajanderi*) to ensure subwatersheds average 2.4 snags/acre. Inoculation will allow for continued tree growth and increase snag diameter while providing cavity habitat.

b. Do not create snags and wildlife trees through tree topping between March 1 and September 30, to avoid potential disturbance to spotted owls and murrelets.

c. Do not cut trees that appear to contain red tree vole or raptor nests.

d. Do not create snags where they appear likely to fall over or slide into public-traveled roads, to avoid increasing hazardous conditions in the range of the roadway and theft of snag material for firewood.

Tables 1 and 2 identify KV projects for Alternatives 1 and 2. The tables list the projects in order of priority and identify some as essential or for mitigation. Those not identified as essential or for mitigation are non-essential or enhancement projects. Estimated costs are included.

Table 1. Alternative 1 KV projects

Prioritized action	Essential	Mitigation	Unit of measure	Unit number	Cost/unit	Total cost
Heavy thin, plant	Yes		Acres	312	645	201,240
Heavy thin, release	Yes		Acres	312	300	93,600
Plant openings	Yes		Acres	92	645	59,340
Release openings	Yes		Acres	92	300	27,600
Stream shade monitoring		Yes	Miles	6	2,000	12,000
Snag creation by mature-tree topping		Yes	Trees	1,241	100	124,100
Snag creation by plantation-tree inoculation[a]		Yes	Trees	1,302	35	45,570
Downed wood creation		Yes	Trees	25,065	5	125,325
Nonsystem road decommissioning[b]		Yes	Feet	8,500	3	25,500
Noxious weed control		Yes	Acres	58	135	7,830
Understory planting			Acres	1,185	645	764,325
Understory release			Acres	296	300	88,800
Snag creation by plantation-tree inoculation 1[c]			Trees	5,209	35	182,315
Noncommercial thinning			Acres	1,847	275	507,925
Snag creation by plantation-tree inoculation 2[d]			Trees	4,250	35	148,750
Riparian natural conifer release			Acres	100	400	40,000
Riparian planting			Acres	50	800	40,000
Riparian release			Acres	50x2	400	40,000
Riparian plant, walk-in			Acres	50	900	45,000
Riparian release, walk-in			Acres	50x2	500	50,000
Large wood for streams			Project	2	150,000	300,000
Meadow maintenance			Acres	51	400	20,400
Meadow creation			Acres	14	1,125	15,750
System road decommission			Miles	53	1,992	107,200
Green River bridge maintenance			Project	1	2,000	2,000
Total						**3,074,570**

[a]Snag creation-plantation tree inoculation mitigation = 20% of total inoculation inside commercially thinned portions of plantations.
[b]Nonsystem road decommissioning includes original logging spurs not used for commercial thinning but needing some stabilization work to eliminate chronic stream sedimentation or the potential for stream sedimentation.
[c]Tree inoculation 1 = total tree inoculation inside commercially thinned portions of plantations minus 20% mitigation.
[d]Tree inoculation 2 = total tree inoculation inside plantations, but outside commercially thinned portions of plantations.

Table 2. Alternative 2 KV projects

Prioritized action	Essential	Mitigation	Unit of measure	Unit number	Cost/unit	Total cost
Heavy thin, plant	Yes		Acres	82	645	52,890
Heavy thin, release	Yes		Acres	82	300	24,600
Heavy thin, plant, walk-in	Yes		Acres	206	734	151,204
Heavy thin release, walk-in	Yes		Acres	206	380	78,280
Plant openings	Yes		Acres	92	645	27,600
Release openings	Yes		Acres	92	300	50,400
Stream shade monitoring		Yes	Miles	6	2,000	12,000
Snag creation by mature-tree topping		Yes	Trees	1,241	100	124,100
Snag creation by plantation-tree inoculation[a]		Yes	Trees	1,256	35	43,960
Downed wood creation		Yes	Trees	24,655	5	123,275
Noxious weed control		Yes	Acres	26	135	3,510
Understory planting			Acres	1,150	645	741,750
Understory release			Acres	287	300	86,100
Understory plant, walk-in			Acres	35	734	25,690
Understory release, walk-in			Acres	9	380	3,420
Snag creation by plantation-tree inoculation 1[b]			Trees	5,026	35	175,910
Noncommercial thinning			Acres	1,634	275	449,350
Noncommercial thinning, walk-in			Acres	209	330	68,970
Snag creation by plantation-tree inoculation 2[c]			Trees	4,104	35	143,640
Riparian natural conifer release			Acres	100	400	40,000
Riparian plant			Acres	50	800	40,000
Riparian release			Acres	50x2	400	40,000
Riparian plant, walk-in			Acres	50	900	45,000
Riparian release, walk-in			Acres	50x2	500	50,000
Large wood for streams			Project	2	150,000	300,000
Meadow maintenance			Acres	51	400	20,400
Meadow creation			Acres	14	1,125	15,750
System-road decommission			Miles	53	1,992	107,200
Green River bridge maintenance			Project	1	2,000	2,000
Total						**3,046,999**

[a]Snag creation-plantation tree inoculation mitigation = 20% of total inoculation inside commercially thinned portions of plantations.

[b]Tree inoculation 1 = total tree inoculation inside commercially thinned portions of plantations minus 20% mitigation.

[c]Tree inoculation 2 = total tree inoculation inside plantations, but outside commercially thinned portions of plantations.

III. Road Decommissioning and Closure

1. Road Decommissioning (NFP: RF-3c, 5, & 6; p. C-32, 33):

a. Review, using a team of planners and engineers, the road project sites before preparing design plans for road-decommissioning contracts. Any changes in design plans will be reviewed by planners and engineers before being incorporated into contracts.

b. Design fill-removal activities to minimize sediment entering stream channels. The objective is to restore stream processes and floodplain access by removing all fill material on the valley floor. Excavate slopes to approximate 1.5:1, where practical; do not encroach on natural slopes. Allow disturbed slopes to revegetate naturally or use erosion control measures (such as tree limbs and tops, native seed mixtures or plants), where a moderate to high potential for surface erosion exists. Where feasible, restore the natural flood plain. Consult with watershed and/or fisheries staff where technical feasibility or economics limit meeting fill removal objectives (SFP: FW-123).

c. Place material excavated from stream crossings and unstable side-cast road fills, and asphalt surfacing material on stable areas at least 60 feet away from stream channels or active flood plains. Suitable areas include roadbeds adjacent to cutbanks, or on previously designated waste areas (if locally available). Remove any alder or conifer from the cut bank before placing excavated material, to enhance soil-to-soil contact and long-term soil stability. Contour waste piles to approximate 1.5:1 to 2:1 slopes and allow to revegetate naturally. Seed piles with a mixture of native species where a moderate to high potential exists for surface erosion, or where noxious weed infestation is likely. Avoid using straw except in extreme circumstances (SFP: FW-117, 171).

d. Place woody debris, if locally available, in stream channels where sediment is expected to erode from channels at amounts that equal or exceed three (3) cubic yards. This strategy will help reduce sediment rates as streams adjust to gradients during the next year's high flows.

e. Install water bars on both sides of excavated stream banks to route surface water away from newly excavated slopes (SFP: FW-123).

f. Stabilize unstable areas (such as road side-cast material) before a road is decommissioned, to prevent fine sediment from entering stream channels. Excavate side-cast fill material adjacent to stream crossings, where fill material could fail, enter streams, or both. Focus on areas where downhill slopes adjacent to roads are greater than 60%, and road fills are within 200 feet slope-distance of streams (SFP: FW-108, 117).

g. Design water bars to facilitate proper drainage of surface water and to prevent ponding. Place water bars in areas where drainage will not destabilize road fills. To keep streams within their channels when culverts are obstructed, build water bars immediately above existing culverts to become the overflow point. Use the Siuslaw National Forest Water Bar Construction Guide to determine water-bar spacing and design (SFP: FW-123).

h. Decompact surfaces of decommissioned roads where necessary, to allow water to percolate through the soil and accelerate the recovery of woody vegetation. Although subsoiling is the preferred method, use ripping if subsoiling is not feasible or economical. Consult a geotechnical specialist to determine feasibility of subsoiling (SFP: FW-162).

i. Transport off-site culverts removed from stream crossings and ditches to be recycled, reused, or disposed of at a landfill.

j. Do not apply specified reconstruction to roads that will be decommissioned.

2. Road Closure (ML1):

a. Close roads placed in ML1 status by one of three methods: growing roadside vegetation, placing an earthen mound or other natural material at or near the road entrance, or installing a guard rail. Closure type will be determined case by case.

b. Stabilize closed roads by reopening culvert inlets where necessary, repairing water bars, or building additional water bars. Build drain dips immediately above stream crossings, to ensure water is kept within stream channels when culvert inlets are obstructed. Harden drain dips with rock to minimize sedimentation of streams when culverts fail.

c. Design and place water bars based on specifications for decommissioned roads.

d. Excavate failing side-cast fill material at stream crossings and at other areas where material could enter streams. Focus on areas where downhill slopes adjacent to roads are greater than 60% and road fills are within 200 feet slope-distance of streams.

IV. Hydrologic Function and Water-Quality Restoration (NFP: RA-1 & FW-1; WR-1, 3; p. C-37)

Wildlife biologists, with technical assistance from U.S. Fish and Wildlife Service biologists, will select trees to be placed in streams for enhancing hydrologic function and water quality. First priority for tree selection will be to use suitable hazard trees or trees blown down across ATM roads. To protect interior forest habitat, existing or potential nesting structure, and neighboring trees with nesting structure from incidental damage, use the following criteria to select additional trees for placement in streams:

1. Select trees that will be dispersed within the first two lines of trees along the periphery of permanent openings such as road rights-of-ways and power line corridors, or along the periphery of nonpermanent openings such as plantation edges;
2. Select trees that will be less than or equal to 36 inches in diameter at breast height and lack existing or potential nesting structure (that is, for murrelets, limbs or other platforms greater than or equal to four inches in diameter);
3. In general, select individual trees; however, on rare occasions, select small groups of no more than three trees where appropriate;

4. Select trees (or small groups of trees defined above) that will be spaced about 100 feet apart; and
5. To the greatest extent possible, select trees to avoid any damage to existing or potential nesting structure in the stand during felling and removal operations.

The following trees will **not** be selected for removal:

a. Trees with potential nesting platforms;
b. Known nest trees;
c. The largest trees in areas where the number of large trees is limited;
d. Trees with the best opportunity to develop future nesting structure.

To evaluate the effectiveness and feasibility of tree selection criteria associated with large wood for stream enhancement, the Forest Service will request technical assistance from the U.S. Fish and Wildlife Service before felling or removing any standing trees not posing an immediate hazard. This technical assistance may include meetings and field reviews as needed and would be both before and during the tree selection process. Additional assistance may also be needed during felling and helicopter operations.

a. To avoid artificially anchoring large wood in streams, large wood length should be at least 1.5 times bank-full width, and large wood diameters (measured at breast height on a tree) should approximate 2 times bank-full depth.

b. Place logs in streams by helicopter only from August 6 through February 28 to reduce potential disturbance to listed species, such as the northern spotted owl and the marbled murrelet.

c. If ground-based equipment is used, place large woody debris (partial- and whole-tree length) in streams during the summer-to-fall low-flow period to minimize disturbance to fish and to lessen safety risks (SFP: FW-117).

d. Plant western redcedar or other shade-tolerant conifer and willow or other native hardwoods in designated riparian areas. Plant trees within 200 feet of stream channels. Include, at least, a fish biologist and a silviculturist in selecting planting sites. Implement animal control measures such as tubing or capping to benefit tree survival and growth. Maintain planted trees as needed for up to 5 years after the sale is closed to facilitate tree survival and growth.

e. Where buffers contain a dense conifer component, thin (but do not harvest) these areas within 5 years after harvest operations are completed, to accelerate developing large wood for streams. Develop thinning prescriptions governed by stream shading requirements and slope stability concerns. Use a silviculturist and a hydrologist or fish biologist in preparing prescriptions. Fell some trees across stream channels to provide additional stream structure; other trees may become snags.

V. Other Activities

1. Treatment of Managed Stands 5 to 15 Years Old (NFP: p. C-12):

The project area contains an estimated 4,082 acres of stands currently ranging from 5 to 15 years old. Of these stands, 1,300 acres have been thinned, about 2,366 acres will be thinned, and about 416 acres will be left to develop on their own.

About 1,847 acres are within 0.25 miles of proposed thinning and harvest units and will be eligible for KV fund collections (revenue collected from the sale of timber). If KV funds are insufficient, other appropriated funds will be needed to fully fund these treatments. Other appropriated funds will need to be available to treat the remaining 519 acres.

a. Leave felled trees on the ground and use a variable tree-density pattern. Omit understory planting at this time. Thinning prescriptions will retain 100 to 200 trees per acre.

b. Leave about 3% of the area in each stand as untreated 3/4-acre clumps. Clumps are expected to total about 70 acres for all stands. A wildlife biologist and silviculturist will determine clump locations.

c. Protect all western hemlock, western redcedar, Pacific yew, cascara, willow, big-leaf maple, chinquapin, and wild cherry.

d. Protect any red alder clumps needed to help stabilize stream channels or other disturbance sites. Consider selective felling of alder near streams if it would benefit the growth and development of nearby conifer.

e. Maintain about 20 red alder per acre where available.

2. Stocking Control:

a. Conduct manual release of conifer during June and July when treatments are most effective.

b. Follow the terms and conditions associated with the appropriate disturbance biological opinion.

3. Creating Early-Seral Habitat, Maintaining Existing Meadows, and Managing Noxious Weeds:

a. Create early-seral habitat in existing plantations in matrix. Where available, use existing laminated root-rot pockets as a core area for early-seral habitat. Follow guidelines in the silviculture prescription to determine appropriate boundaries of early-seral habitat when using root-rot pockets.

b. Remove encroaching conifers, woody vegetation, and other unwanted vegetation such as noxious weeds and non-native plants from existing meadows to maintain meadow habitats. This activity will be coordinated by a wildlife biologist, a botanist, and a fish biologist.

c. Control non-native or unwanted vegetation in meadows during periods identified to be most effective for the target species. Use biological methods over manual methods, if they are available and more effective in controlling unwanted vegetation.

4. Roadside Hazard Trees:

a. Identify hazardous trees by the principles outlined in "Long Range Planning for Developed Sites in the Pacific Northwest" (USDA 1992), "Oregon guidelines for selecting reserve trees" (USDA, USDI, et al. 1995), and Oregon Administrative Rules 437-006-0001.

b. Evaluate hazard trees by including a road manager, a wildlife biologist, and a silviculturist (or another person trained in hazard-tree identification) along ATM roads and timber-sale haul routes to determine which trees, snags, or both need to be felled or topped to remove roadside hazards. Give priority to using felled or topped materials in place for coarse woody debris or for stream restoration before selecting them as saw logs, wood fiber, or firewood.

5. ATM Road Maintenance: Remove conifers and hardwoods on ATM road cut banks or road fills through sales or service contracts. Where possible, use planned commercial thinning sales as a means for removal before using a "road corridor" sale.

6. Green River Bridge: Maintain the Green River bridge investment.

7. Waste Areas:

a. Use an interdisciplinary process to determine sites for waste areas.

b. Place material removed from road failure sites in stable areas at least 60 feet away from stream channels. When necessary, use previously designated waste areas. Contour waste piles should approximate 1.5:1 to 2:1 slopes. Allow piles to revegetate naturally or use erosion control measures where a moderate to high potential exists for surface erosion, or where noxious weed infestation is likely. Avoid using straw except in extreme circumstances (SFP: FW-117, 171).

c. Level and seed long-term (multiyear use) waste areas after each season of use. Short-term (one-time use) waste areas should be shaped or graded to contour, seeded, and--where other resource objectives are not compromised--planted with appropriate tree species.

VI. Special-Use Road Permits

1. Private Road Permit: Roseburg Forest Products will be granted a private road special-use permit (FS-2700-4c) to construct, maintain, and use a road across National Forest land in section 26, T15S, R10W. This permit will serve to mitigate the loss of access to their property located in sections 25 and 26 because of decommissioning road 3231. The new road will be about 1/2-mile long and on or near a ridge system.

Limits for the road design include maximum 12-foot-wide aggregate running surface, average 20-foot clearing limit, and leaving cut trees on site as coarse woody debris.

2. Hauling Permits: The existing Forest System roads that access private land may be used for private hauling of timber. Road-use permits (FS-7700-41) may be issued to allow hauling after any required consultation with the US Fish and Wildlife Service and the National Marine Fisheries Service for actions proposed by private land owners is completed.

VII. Monitoring Objectives

Typically, about 5% of Forest funds is used for monitoring Forest projects. The Team regards the management study as an opportunity to use the funds intended for monitoring on the Forest more effectively. Because of its identified monitoring strategies and priorities, the management study is expected to be a high priority for Forest funding relative to other Forest projects.

Monitoring items include those required for implementation and effectiveness monitoring. Implementation monitoring determines if the project design criteria and both the Northwest and Siuslaw Plans standards and guides were followed. Effectiveness monitoring evaluates whether applying the management activities achieved the desired goals, and if the objectives of the standards and guides were met. Findings resulting from project observations and monitoring are expected to help influence designing future projects and developing future monitoring plans.

1. Implementation Monitoring

Forest Plan Standards and Guides

Before the contract is advertised, review project contracts for consistency with the standards and guides of both the Northwest and Siuslaw Plans and project design criteria.

USFWS Biological Opinion Terms and Conditions

The standards common to all actions described on pages 3 to 5 of the habitat modification biological opinion are incorporated as terms and conditions (p. 32). The Fish and Wildlife Service believes that incidental take for listed species has been minimized if these standards are adhered to, to the extent that additional terms and conditions are not required.

Contract and Operations

Involve appropriate specialists when developing contracts (for example, with plan-in-hand reviews) or conducting District operations work to ensure activities are implemented as designed. The appropriate specialists will also participate periodically during contract work, especially when unusual circumstances arise that may require a contract modification.

2. Effectiveness Monitoring

Management Study

Refer to Appendix A of the final EIS, tables A-3 through A-5 for monitoring information.

Vegetation Management

a. Monitor treated stands as part of the Forest Monitoring Plan, Vegetation Condition section. Focus observations on tree survival and growth and on planted trees.

b. Monitor trees planted in the understory for survival and growth, as part of the Forest Monitoring Plan, Vegetation Condition section.

c. Monitor created snags and wildlife trees as part of the Forest Monitoring Plan, Wildlife Habitat section. This site offers opportunities to observe effects of fungal injection. Observations will focus on the location and rate of decay, and use by cavity nesters.

d. Observe all thinned stands to determine if residual trees are being damaged by Douglas-fir bark beetles. This activity will be tiered to the Forest insect and disease monitoring program.

e. Evaluate riparian leave areas as to their effectiveness in maintaining stream shading.

f. Observe areas treated for controlling noxious weeds the first year after treatment and as needed thereafter to determine if additional treatments are necessary.

g. For a period of three years after harvest, annually monitor high and moderate risk (to weed infestation) thinned and harvested units to determine effectiveness of preventive strategies. Monitoring information will be used to develop prescriptions for future noxious-weed treatments in and adjacent to units.

h. Conduct a field review of the buffered loose-flowered bluegrass population adjacent to the bottom of unit 305 one year after the unit is harvested to evaluate post-harvest population status and response.

Road Treatments

a. Field-review excavated slopes from road stabilization activities and note areas where eroded materials enter stream channels. Make observations after the first major rainfall and seasonally thereafter until vegetation reoccupies disturbed sites (about 2 to 5 years). If the surface is eroding and could adversely affect fish habitat, take steps to eliminate or reduce erosion.

b. Observe road surface treatments such as water bars to determine effectiveness and effects on the stability of the outer portion of the road prism.

c. Review the effectiveness of road closures to determine whether another form or location of closure will be required at or near road entrances.

d. Tier monitoring to the Forest Monitoring Plan, Aquatic Resources section.

Fish Habitat Treatments

a. Use Oregon Department of Fish and Wildlife and U.S. Forest Service stream surveys to assess changes from measured baseline data in fish habitat characteristics of streams where large wood was added.

b. Tier monitoring to the Forest Monitoring Plan, Aquatic Resources section.

Appendix C

List of Roads To Be Decommissioned

These roads will be decommissioned under Alternative 1 of the Five Rivers Landscape Management Project Record of Decision for terrestrial and watershed restoration actions that are connected to commercial thinning and associated actions.

Subwatershed	Road Number	Road Miles
Cascade	3210-114	0.4
Cascade	3210-119	0.1
Cascade	3210-120	0.5
Cascade	3215	3.6
Cascade	3215-113	0.1
Cascade	3215-114	1.6
Cascade	3215-116	0.1
Cascade	3215-117	0.2
Cascade	Lower 3220	2.4
Cascade	5818	1.3
Cascade	5818-110	0.2
Cascade	5818-111	0.2
Cascade	5818-113	0.2
Cascade	Unumbered 5818 spur	0.2
Crab	3230-113	0.8
Crab	3230-115	0.6
Crab	3232-220	0.4
Crab	3232-225	0.2
Crab	3700-112	0.5
Crab	3700-118	0.2
Crab	3700-138	0.2
Crab	3700-142	0.7
Crab	3700-200	0.6
Crab	3700-201	0.1
Green River	3228-111	0.5
Green River	3228-112	0.1
Green River	3228-113	0.3
Green River	3228-116	0.4
Green River	3235	1.4
Green River	3236	1.4
Green River	3250-113	0.9
Green River	3250-115	0.6
Green River	3250-116	0.2
Green River	3250-121	0.1
Green River	3250-122	0.1

Subwatershed	Road Number	Road Miles
Lower Buck	3705-112	0.8
Lower Buck	3705-117	0.1
Lower Buck	3706-112	0.1
Lower Five	3222	1.1
Middle Five	3225-117	0.1
Upper Buck	3700-147[a]	0.2
Upper Buck	3700-148[a]	0.1
Upper Buck	3706-115	0.2
Upper Five	3235-111	0.4
Total		**24.5**

[a] From road 37 to north boundary of stand 475.

Appendix D

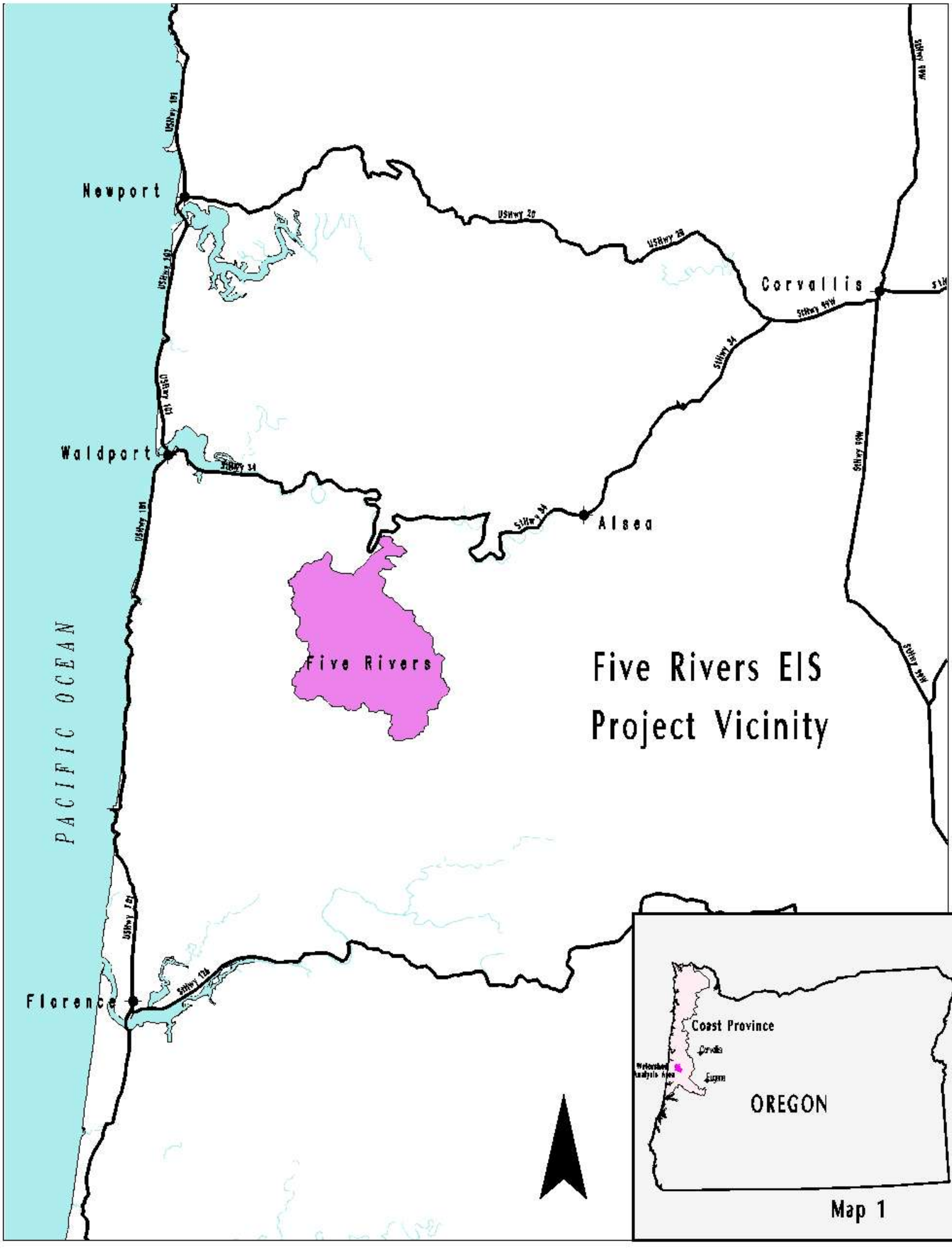
List of Plantations To Be Noncommercially Thinned

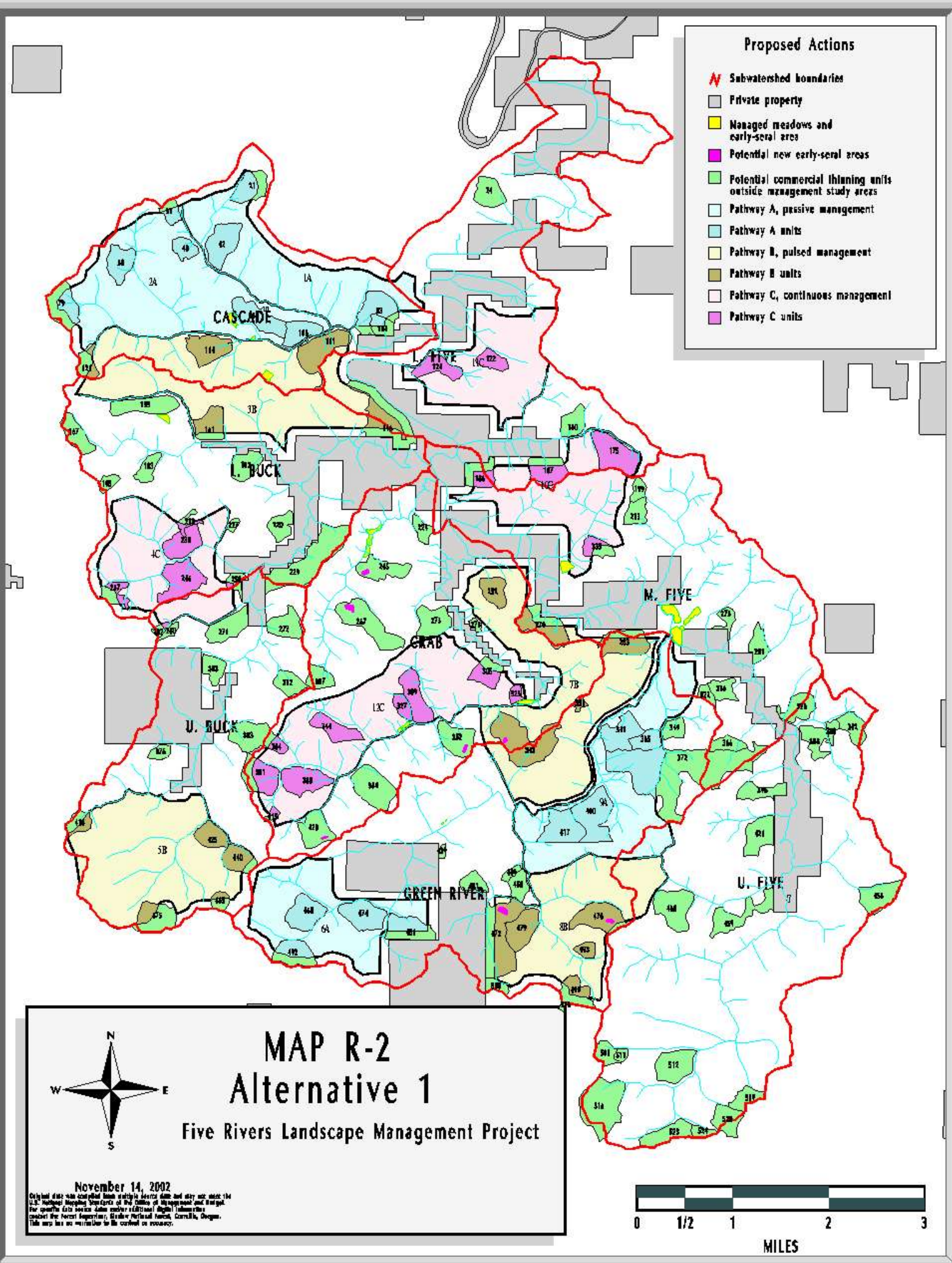
These plantations will be noncommercially thinned under Alternative 1 of the Five Rivers Landscape Management Project Record of Decision for terrestrial and watershed restoration actions that are connected to commercial thinning and associated actions.

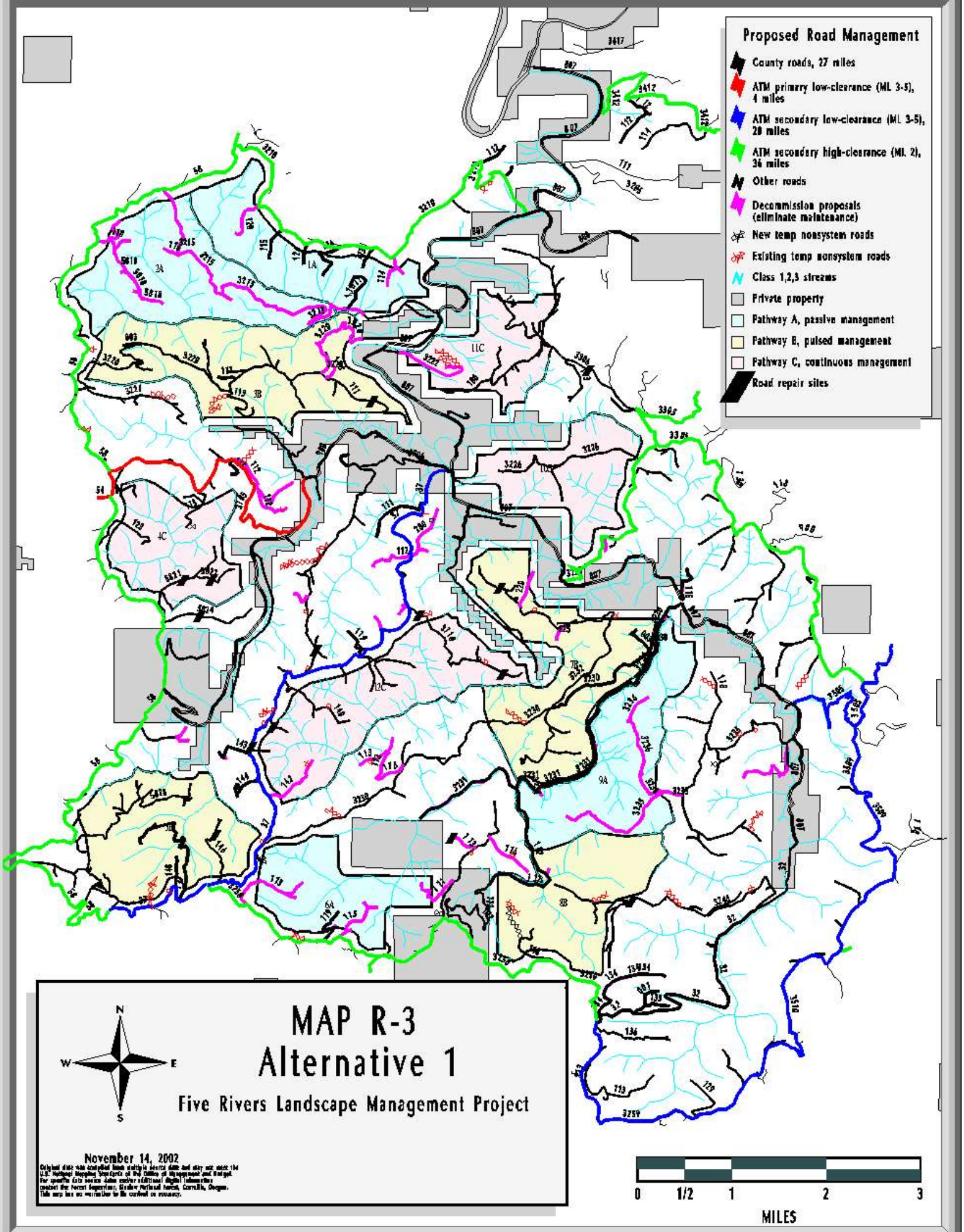
Subwatershed	Stand Number[a]	Acres
Cascade	113	27
Cascade	118	14
Cascade	126	12
Cascade	130	10
Cascade	131	12
Cascade	133	34
Crab	219	23
Crab	248	34
Crab	256	25
Crab	259	28
Crab	266	23
Crab	285	51
Crab	288	55
Crab	291	6
Crab	294	7
Crab	295	32
Crab	319	53
Crab	329	20
Crab	371	23
Green River	442	17
Green River	453	16
Green River	458	2
Green River	462	10
Green River	464	11
Green River	469	2
Green River	473	11
Green River	487	10
Green River	491	3
Lower Buck	142	24
Lower Buck	149	4
Lower Buck	156	24
Lower Buck	157	43

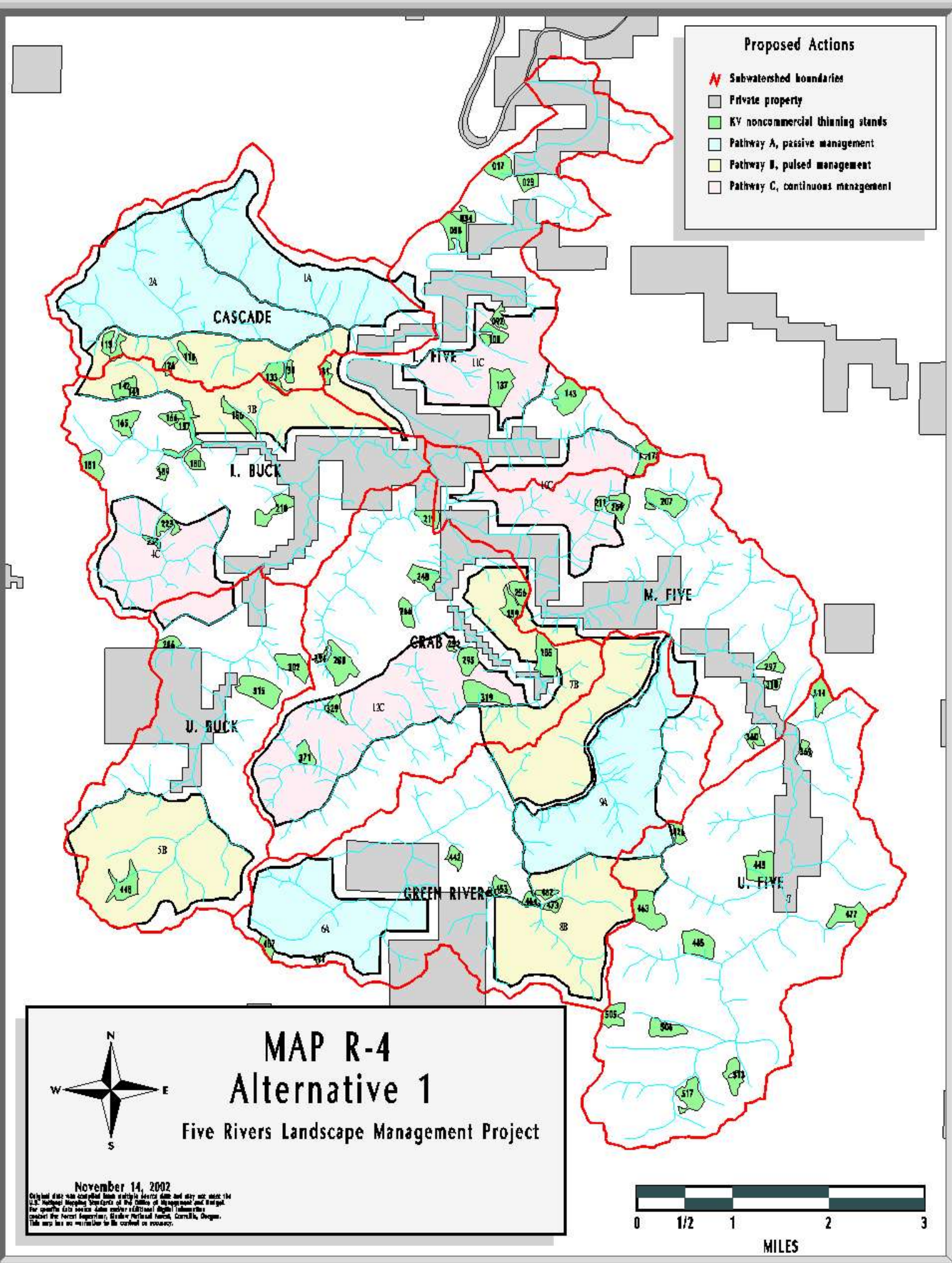
Subwatershed	Stand Number	Acres
Lower Buck	165	33
Lower Buck	166	16
Lower Buck	180	20
Lower Buck	181	35
Lower Buck	189	9
Lower Buck	210	36
Lower Buck	223	21
Lower Buck	234	8
Lower Five	017	35
Lower Five	023	20
Lower Five	034	18
Lower Five	038	44
Lower Five	092	15
Lower Five	108	27
Lower Five	137	50
Lower Five	143	55
Lower Five	178	34
Middle Five	207	50
Middle Five	209	29
Middle Five	211	9
Middle Five	297	22
Middle Five	318	10
Middle Five	360	17
Upper Buck	286	16
Upper Buck	302	41
Upper Buck	315	62
Upper Buck	448	43
Upper Five	314	38
Upper Five	369	9
Upper Five	426	15
Upper Five	443	54
Upper Five	463	63
Upper Five	477	46
Upper Five	485	50
Upper Five	505	29
Upper Five	506	34
Upper Five	513	29
Upper Five	517	41
Total		**1,847**

[a] All stands have a "502" prefix


Newport
Waldport
Corvallis
Albany
Florence
PACIFIC OCEAN
Five Rivers
Five Rivers EIS
Project Vicinity
USHwy 101
USHwy 20
USHwy 26
USHwy 34
USHwy 126
USHwy 99W
Coast Province
OREGON
Map 1


Proposed Actions
Subwatershed boundaries
Private property
Managed meadows and early-seral area
Potential new early-seral areas
Potential commercial thinning units outside management study areas
Pathway A, passive management
Pathway A units
Pathway B, pulsed management
Pathway B units
Pathway C, continuous management
Pathway C units
CASCADE
L. FIVE
L. BUCK
M. FIVE
GRAB
U. BUCK
GREEN RIVER
U. FIVE
MAP R-2
Alternative 1
Five Rivers Landscape Management Project
November 14, 2002
0 1/2 1 2 3
MILES


Proposed Road Management
County roads, 27 miles
ATM primary low-clearance (ML 3-5), 4 miles
ATM secondary low-clearance (ML 3-5), 28 miles
ATM secondary high-clearance (ML 2), 36 miles
Other roads
Decommission proposals (eliminate maintenance)
New temp nonsystem roads
Existing temp nonsystem roads
Class 1,2,3 streams
Private property
Pathway A, passive management
Pathway B, pulsed management
Pathway C, continuous management
Road repair sites
N
W
E
S
MAP R-3
Alternative 1
Five Rivers Landscape Management Project
November 14, 2002
0
1/2
1
2
3
MILES


Proposed Actions
Subwatershed boundaries
Private property
KV noncommercial thinning stands
Pathway A, passive management
Pathway B, pulsed management
Pathway C, continuous management
CASCADE
L. FIVE
L. BUCK
M. FIVE
GRAB
U. BUCK
GREEN RIVER
U. FIVE
MAP R-4
Alternative 1
Five Rivers Landscape Management Project
November 14, 2002
0 1/2 1 2 3
MILES