

Interim Protection for Late-Successional Forests, Fisheries, and Watersheds

National Forests East of the Cascade Crest,
Oregon and Washington

A Report to the United States Congress and the President

Executive Summary September 1993

Eastside Forests Scientific Society Panel

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Executive Summary

For the past decade, the national forests of western Washington and Oregon have received regional and national attention because of their central role in the economic and ecological health of the Pacific Northwest. The national forests east of the Cascade crest¹ are no less important and, like the western forests addressed by the President's April Forest Conference and resulting Forest Plan, are also receiving national attention. Yet despite the importance of these Eastside forests, we have no synthesis of scientific information about their status and that of the associated biological resources.

To fill this void, a bipartisan group of seven members of the US House of Representatives approached several scientific societies to form the Eastside Forests Scientific Society Panel to "initiate a review and report on the Eastside forests of Washington and Oregon." They hoped to make "every effort to include the Eastside forests in whatever ancient forest legislation is considered by the Congress." The panel's mandate was to broadly review the status of all Eastside forests and their associated resources. In contrast, the mandate of the Forest Health Assessment Team (the Everett Panel) was narrower. This team focused largely on forest health and only in six river basins; their report is described as "general in nature" (US Forest Service 1993).

The geographical extent of old-growth forest ecosystems in Eastside national forests has been dramatically reduced during the twentieth century; continued logging of old growth outside current reserves will jeopardize unknown numbers of native species. Forest harvest and other human actions have also changed the character of many other components of Eastside landscape including rivers with their populations of resident and migratory salmonids. Many ecologists believe that the combined effects of logging old growth and fire prevention have significantly increased the vulnerability of Eastside landscapes to catastrophic disturbances, further threatening what are already severely reduced habitats.

The Eastside Forests Scientific Society Panel pulled together existing information in a report that defines current conditions and offers interim recommendations for protecting the remaining resources until a long-term plan for protection and restoration can be formulated. This executive summary provides an overview of the report and the panel's interim recommendations; the complete printed report will be available in October 1993.

The Data Sets

Our analysis of late-successional/old-growth forest (LS/OG)² is based largely on (1) the National Audubon Society Adopt-a-Forest Project carried out in cooperation with the US Forest Service (USFS) and (2) in-house USFS old-growth inventories. Both projects involved interpretation of aerial photography and validation by ranger district staff and, sometimes, field

¹ Ten national forests (Fremont, Winema, Deschutes, Ochoco, Malheur, Umatilla, Wallowa-Whitman, Wenatchee, Colville, Okanogan) occupy lands between the Cascade Crest and the eastern boundaries of Washington and Oregon.

² In this report we follow the definition of late-successional/old-growth forest (LS/OG) as stated in Hopkins (1992), Hopkins et al. (1992a,b), and Williams et al. (1992a,b) with two important exceptions: (1) We adopt a minimum patch size for LS/OG of 0.5 acres, as opposed to the 10 to 80 acres in USFS interim guidelines, and (2) old-growth tree is defined by either size or age, not both (see full report for more detail).

reconnaissance. USFS also furnished many additional details about the national forests of the Eastside. Recent efforts by state and regional chapters of the American Fisheries Society defined aquatic diversity management areas (Oregon) or their equivalents (Washington). All available geographical data were assembled in a geographic information system (GIS) by the Sierra Biodiversity Institute.

Resource Conditions

The forest ecosystems east of the Cascade crest differ significantly from those west of the crest. Compared with Westside forests, forests east of the crest grow in a more extreme climate—hotter and drier in summer and colder in winter—and on soils that are often less productive. Their structure is more open, with a grassy understory maintained by frequent, light groundfires; the habitat requirements of fish and wildlife may also differ.

Late-successional/old-growth forest

Current levels of late-successional old growth on the Eastside fall far below historic levels, particularly in lower-elevation forests dominated by ponderosa pine, western larch, and Douglas fir. Only about 20 to 25% of remaining LS/OG is currently protected administratively or by statute (from 8% in Wallowa-Whitman National Forest to 32% in Deschutes National Forest). From 70 to 95% of the LS/OG patches that remain cover less than 100 acres each—too small to provide for the basic needs of many LS/OG-associated species. Three national forests (Colville, Wallowa-Whitman, and Winema) have no LS/OG patches larger than 5000 acres; of the seven LS/OG patches in three national forests (Malheur, Ochoco, and Umatilla) that are larger than 5000 acres, only one is protected.

Continued logging of currently unprotected LS/OG at 1980s rates would reduce the area occupied by these unique ecosystems to between 7 and 13% of forested lands in the national forests. Further reduction in LS/OG is likely to jeopardize many components of the biological diversity of Eastside forests and increase the numbers of threatened or endangered species, especially among sensitive wildlife such as the American marten, northern goshawk, pileated woodpecker, white-headed woodpecker, and flammulated owl.

Many areas set aside in current forest plans as “designated old growth” are not old growth. The overlap of actual and designated old growth varies significantly among national forests: in Winema National Forest, only 16% of designated old growth patches contain more than two-thirds actual old-growth forest, but in Wallowa-Whitman National Forest, 70% of designated old-growth patches contain more than two-thirds actual old growth.

Ponderosa pine forests have been especially hard hit by logging. Only 3–5% of the original ponderosa climax old growth remains in Deschutes, 5–8% in Winema, and 2–8% in Fremont national forests. But the impact of human actions in Eastside forests goes well beyond logging. Road construction, grazing, and fire control also may degrade forests and associated resources.

Aquatic systems

Since Europeans settled the region, the ability of aquatic systems to sustain populations of native vertebrates has been compromised: large numbers of fish and amphibian taxa now face extinction in watersheds throughout the Eastside. Salmon production in the Columbia River has declined to less than five percent of its historic levels. At least 106 major populations of migratory salmon and steelhead trout have been extirpated on the West Coast, many of these east of the Cascades. Resident species that complete their life cycles within freshwater habitats are also threatened

with extinction. In Oregon, 24 of 25 at-risk resident fish species or subspecies occur exclusively in Eastside waters; 14 are found in watersheds within the boundaries or immediately downstream of national forests.

Roadless regions

Because roads crisscross so many forested areas on the Eastside, existing roadless regions have enormous ecological value. Unfortunately, few of these remaining areas are protected; in the Blue Mountains of eastern Oregon and Washington, for example, less than 8% of 722,000 acres of forested, roadless area is administratively protected. Although roads were intended as innocuous corridors to ease the movement of humans and commodities across the landscape, they harm the water, soils, plants, and other animals in those landscapes.

Riparian corridors

Riparian (river, stream, and lake-edge) corridors—which link forest and stream environments, serve as buffer zones protecting water resources, and support a disproportionate share of regional biological diversity—have been damaged by logging, road construction, and grazing throughout the Eastside. This destruction also threatens the flow of high-quality water for use by humans.

Soils

Soils on steep slopes, especially pumice, are vulnerable to erosion when disturbed, leading to siltation and reducing soil fertility. It takes a minimum of 200 years to reestablish old-growth forests on the best, most stable sites after logging; it could take much longer on fragile sites. In particularly fragile areas, forest cover could be permanently lost.

Elements and processes

In short, the elements (genetic diversity and richness of species and habitats) and processes (hydrological, biological, and ecological) that characterize the ecosystems and landscapes of the Eastside have been heavily altered by recent human activities. What many people do not realize is that such alterations in turn jeopardize the very real services provided to human society by these elements and processes. Only by implementing an ecologically sound management program can future generations continue to harvest the benefits of these forests and their associated resources. The following recommendations are designed to protect the remaining resources until a long-term strategy of protection and restoration can be developed.

Interim Recommendations of the Eastside Forests Scientific Society Panel

- 1. Do not log late-successional/old-growth forests in eastern Oregon and Washington.**
The significantly reduced area and fragmentation of Eastside late-successional/old-growth forests from past logging and road construction threatens many forest and aquatic species. Furthermore, the ability of regional landscapes—critical aquatic and terrestrial habitats, especially—to absorb and buffer natural and human-induced disturbances is diminished. Deferring LS/OG logging on all remaining fragments will create a “time out,” allowing scientists to rigorously assess the status of LS/OG forests and develop a strategy to protect them.
- 2. Cut no trees of any species older than 150 years or with a diameter at breast height (DBH) of 20 inches or greater.**
It is essential to conserve as many of the mature trees of Eastside forests as possible in the short term to sustain these forests in the long term. Mature trees have lived for decades, even centuries; their very existence demonstrates that they have the genetic characteristics to survive the full range of environmental variation present in eastern Oregon and Washington. They are reservoirs of genetic diversity and serve as irreplaceable seed sources for forest regeneration; they replenish the depleted supply of large snags and fallen logs, providing nest and den sites for many animals; and they furnish unique historic records. As forester Boyd E. Wickman (1992) points out, they are “living examples of our long-term objectives.”
- 3. Do not log or build new roads in aquatic diversity management areas (ADMAs).**
ADMAs are defined as locations where native aquatic species are at risk of extinction and vulnerable to future disturbance, whole watersheds that represent the best remaining examples of native aquatic ecosystems, or connecting corridors that provide an essential link between habitats required to support fish populations at critical times in their life cycles. Such areas contain the last vestiges of quality habitat and genetic resources for native fish and other aquatic biota. They serve as cornerstones for any future efforts to protect dozens of at-risk stocks or to rebuild the lost production of native fishes. In addition, they provide the benchmarks for evaluating effects of land management and defining the ecological processes that restoration should emulate.
- 4. Do not construct new roads or log within current (1) roadless regions larger than 1000 acres or (2) roadless regions that are biologically significant but smaller than 1000 acres.**
Roadless regions exemplify the least human-disturbed forest and stream systems, the last reservoirs of ecological diversity, and the primary benchmarks for restoring ecological health and integrity. Roads fragment habitat; alter the hydrology of watersheds; supply excessive sediment to streams; increase human access and thus disturbances to forest animals; and influence the dispersal of plants and animals, especially exotic species, across the landscape.
- 5. Establish protected corridors along streams, rivers, lakes, and wetlands. Restrict timber harvest, road construction, grazing, and cutting of fuelwood within these corridors.**
Riparian corridors are particularly important in the semiarid environments dominating eastern Oregon and Washington. Seventy-five percent of terrestrial species known to occur in

the Blue Mountains, for example, either depend directly on riparian zones or use them more than other habitats. Riparian areas also function as buffers that can reduce the effects on waterways of human land use, such as fertilizer and pesticide runoff from agriculture. Perennial streams with and without fish should be protected by a buffer zone on each side that is at least 300 feet wide horizontally, regardless of slope, or as wide as the 100-year floodplain, whichever is greater. Lakes, ephemeral and intermittent streams, seeps, springs, and wetlands should be protected by a buffer at least 150 feet wide on all sides.

Furthermore, modifying stream configuration by means of instream structures such as deflectors and cabled logs should not be done as a surrogate for riparian-zone recovery. The greatest limitations to Eastside fish production, for example, are high water temperatures and sediment loads; structures do nothing to mitigate or reverse the effects of either of these factors. Instream structures should not be installed without thorough watershed-level analysis to determine the approach that best protects and restores ecological elements and processes.

6. **Prohibit logging of dominant or codominant ponderosa pine from Eastside forests.** Restoring ponderosa pine to its former position of dominance in Eastside forests must be done to protect and restore Eastside forest ecosystems. The mature ponderosa pines that remain constitute important points of origin for any recovery process, whether or not these trees are in LS/OG patches. Their protection must be a high priority independent of the patch size in which the trees are located.
7. **Prohibit timber harvest in areas prone to landslides or erosion unless it can be conclusively demonstrated by peer-reviewed scientific study that no associated soil degradation or sediment input to streams results from that harvest.** Protecting soil fertility and stream water quality must be a high priority of all land management. Therefore, no logging should be permitted on slopes with a gradient steeper than 30% on pumice soils and 60% on other soil types. Logging on slopes between 30 and 60% should retain 40% of maximum basal area,³ at least one-half of this basal area in trees larger than the quadratic mean diameter of unlogged trees.
8. **Prevent livestock grazing in riparian areas except under strictly defined conditions that protect those riparian areas from degradation.** Poorly managed grazing in riparian zones often contributes to degradation of the terrestrial and aquatic components of regional landscapes. Grazing may therefore be incompatible with protection of LS/OG and ADMAs, including assurance of their role as sources of colonists for restoring adjacent areas.

The first step is to evaluate the condition of riparian areas in Eastside forests, including the extent to which grazing is injuring those areas. The second step is to initiate long-term monitoring programs to track the condition of grazed and ungrazed areas. If these evaluations or monitoring programs demonstrate a threat to the health or integrity of LS/OG and ADMAs, grazing should be prohibited. Elsewhere, (a) if an area has not been degraded by previous grazing, grazing could be permitted, but only when management plans (e.g., allotment management plans) are revised to incorporate ecological standards consistent with

³ Basal area is the summation of the area in a stand occupied by tree boles; quadratic mean diameter is the mean of trees in a stand.

the long-term protection of streams, and the grazing does not degrade the riparian zone; (b) no grazing should be permitted in degraded riparian zones until conditions have been restored; (c) after restoration, livestock grazing should be permitted only to the extent that it does not damage restored areas, and management plans have been revised to meet appropriate ecological standards.

9. **Do not log on fragile soils until it is conclusively demonstrated by peer-reviewed scientific study that soil integrity is protected and that forest regeneration after logging is assured.**

Many Eastside forests grow on areas that are transitional to grassland or desert (at low elevation) and to alpine habitat (at high elevation). Mature trees probably became established in transition areas only during periods of unusually favorable weather. Their persistence helps maintain soil structure and populations of beneficial soil organisms, and mature trees can survive low-intensity groundfires. Forest regeneration on transition and high-elevation sites may be difficult. Moreover, soils such as ash soils may be relatively productive but vulnerable to compaction and loss of topsoil. Noxious weeds (usually introduced exotic species) contribute to site degradation if the cover of mature trees is removed from fragile sites. With proper silvicultural techniques, however, soils can probably be protected and forest regenerated on many transition sites. Before logging is permitted on a site, site-specific logging plans should be required to demonstrate that silvicultural techniques will not diminish the productive capacity of local soils.

10. **Establish a panel with the appropriate disciplinary breadth to develop long-term management guidelines that will protect Eastside forests from drought, fire, insects, and pathogens.**

Fire prevention and early logging practices have altered some LS/OG systems, making them vulnerable to drought, insects, and fire. Salvage (removing dead, fallen woody material) and thinning (cutting small live trees) are two legitimate techniques—but not the only ones—for lowering risk from such disturbances. But lack of consensus and past abuses, in which large healthy trees were cut in the guise of salvage, lead us to recommend a comprehensive study of this issue. Scientists disagree over how to define the goals of salvage and thinning and over the rules for selecting areas where salvage or thinning is required. No consensus exists on silvicultural practices for minimizing effects from drought, fire, insects, and pathogens; on the conditions under which LS/OG should be entered to reduce risk of catastrophic loss; or on the levels of treatment that reduce risk without compromising ecological values. Sustaining regional natural resources and their use depends on enlightened and comprehensive approaches to protecting forest health.

11. **Establish a second panel to produce a coordinated strategy for restoring the regional landscape and its component ecosystems. Emphasize protecting the health and integrity of regional biotic elements as well as the processes on which they depend.**

Existing forest plans are inadequate to address the complex ecological issues in Eastside forests, especially with regard to management of late-successional/old-growth systems. Forest plans must be revised to integrate new ecological understanding of the influences of Euroamerican settlement with the changing societal attitudes now defining desirable conditions of regional landscapes and their resources. Before those plans can be revised,

comprehensive inventories of the status of natural resources must be completed for each forest.

National policies need to be brought into line with national priorities for public lands. To meet current needs for protection and restoration, USFS personnel need to be supported with appropriate funding and incentives. Because federal lands are embedded in landscapes that often contain significant amounts of private, state, and tribal lands, regional programs must be grounded in cooperation among diverse ownership groups. Long-term management programs designed to protect the ecological integrity of regional landscapes must be given the highest priority on private as well as public lands. That integrity depends on protecting both the elements (genetic diversity, richness of species and habitats) and the processes (demography, hydrology, nutrient cycling, fire) within regional landscapes. We especially note that this goal cannot be accomplished by applying techniques intended to mimic an assumed historical distribution of major habitat types or forest age classes. Mimicking "old-growth structure," as advocated by some silviculturalists, is not enough to protect the elements and processes of living late-successional/old-growth forests and their associated resources.

The panels called for in recommendations 10 and 11 should include representatives from all relevant disciplines and members from federal and state agencies, academia, scientific societies, and other groups with appropriate expertise.

Summary

Our recommendations concentrate on the protection of remaining late-successional/old-growth forests, aquatic diversity management areas, roadless regions, and riparian corridors because they are the basic building blocks for reconstructing or restoring the Eastside landscape. Without them, opportunities will be limited for building a long-term strategy to ensure sustainable supplies of Eastside natural resources.

Acknowledgments

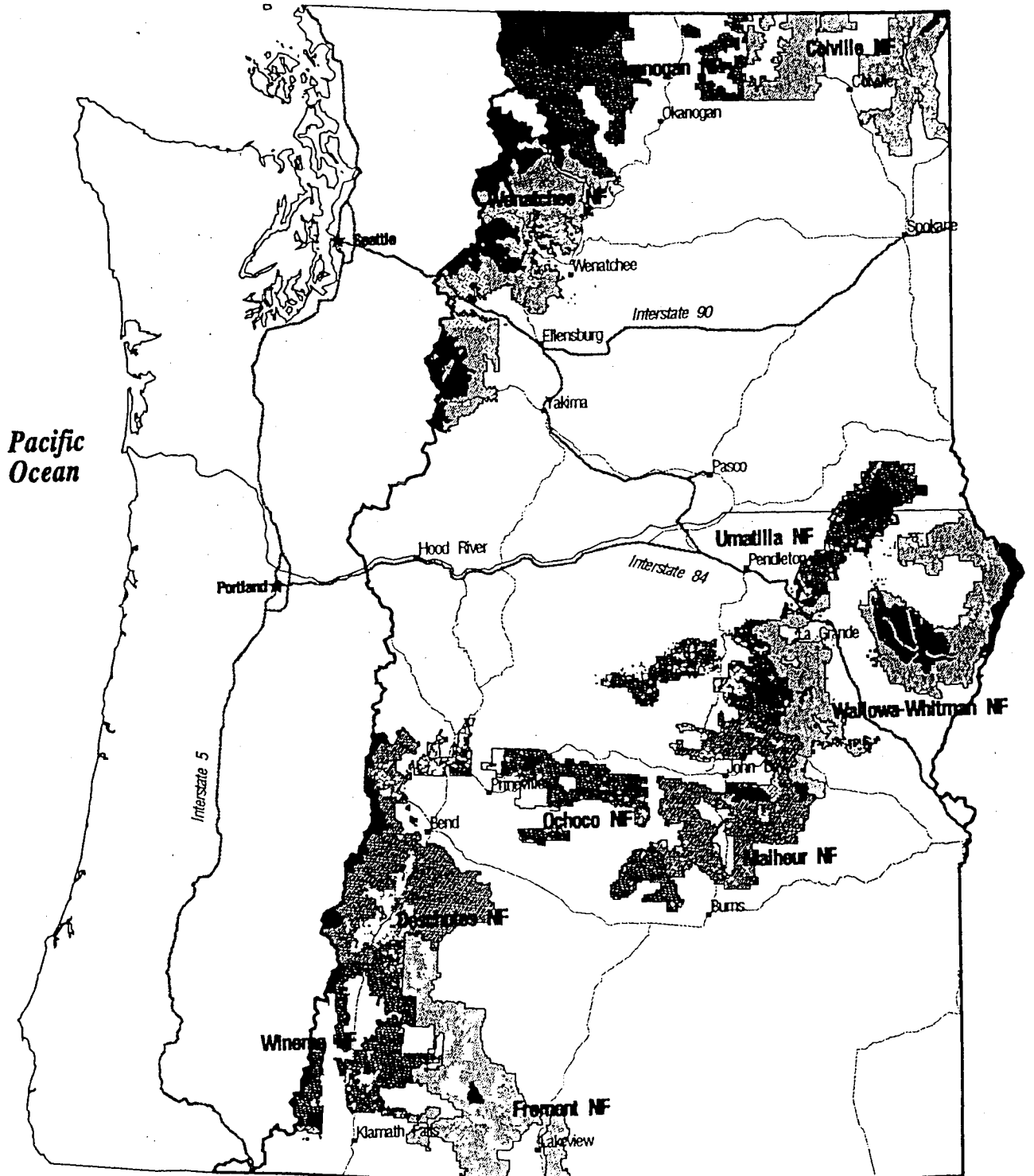
Funding for development and publication of this report was provided by the W. Alton Jones Foundation, Pew Memorial Trust, and Bullitt Foundation. The US Forest Service, especially Regional Forester John Lowe and his staff, provided digital data sets and answers to many of our queries; this report would not have been possible without USFS cooperation. The following organizations also provided valuable assistance: National Audubon Society, The Wilderness Society, Oregon State Service Center, Oregon Department of Fish and Wildlife, Washington Departments of Wildlife and Fisheries, Columbia River Inter-Tribal Fish Commission, Oregon Chapter of The Wildlife Society, and Oregon and North Pacific International Chapters of the American Fisheries Society. Many others aided us in preparing this document; they are acknowledged in the full report.

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Eastside Forests of Washington and Oregon



■ Wilderness Areas

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


Eastside Forests Scientific Society Panel

**Eastside Forests Scientific Society Panel
 Eastside Oregon National Forests
 AFS Aquatic Diversity Maintenance Areas**



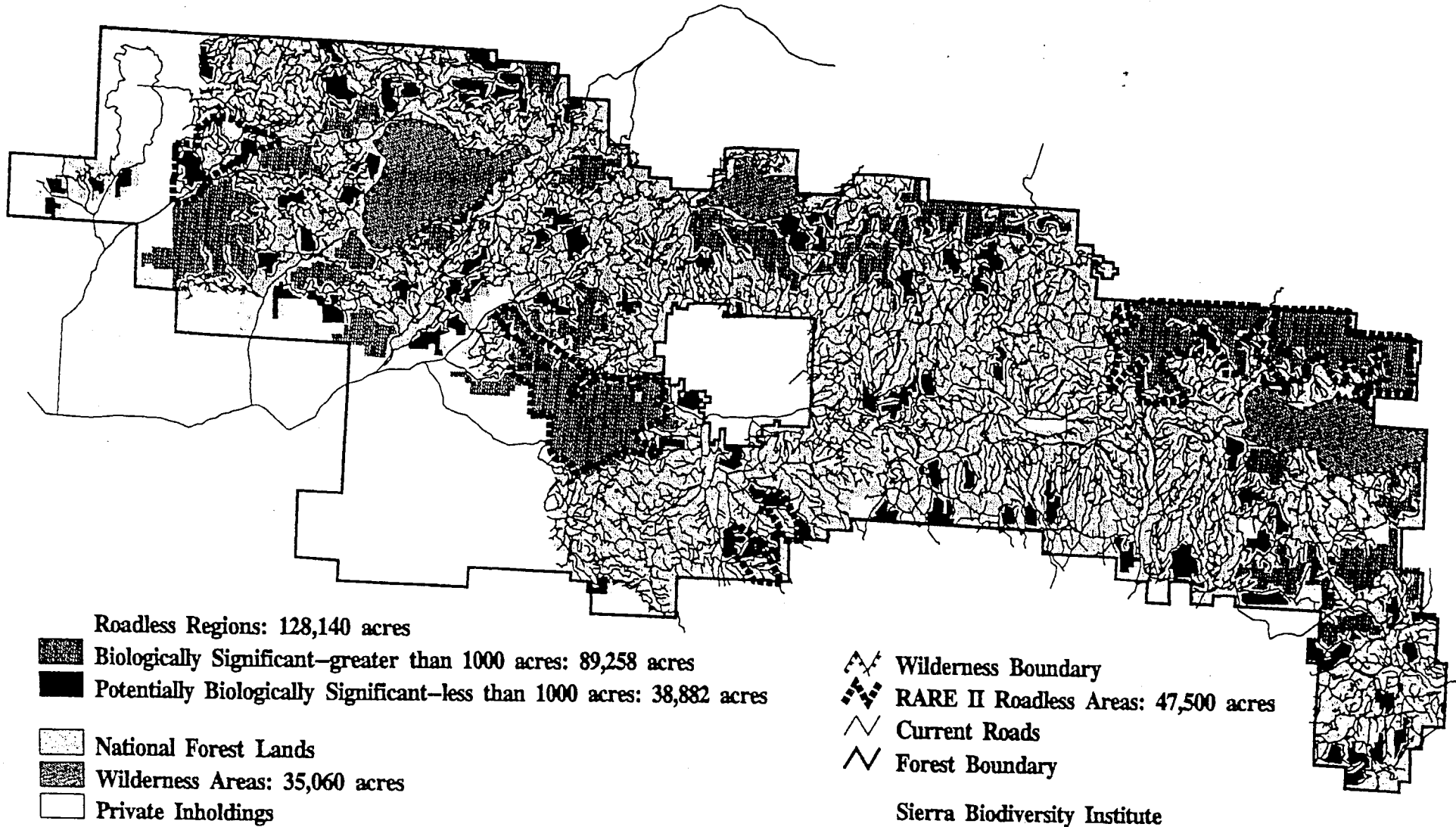
1 inch = 40 miles

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-  AFS Aquatic Diversity Maintenance Areas
-  Wilderness
-  Eastside Oregon National Forests
-  Private Lands

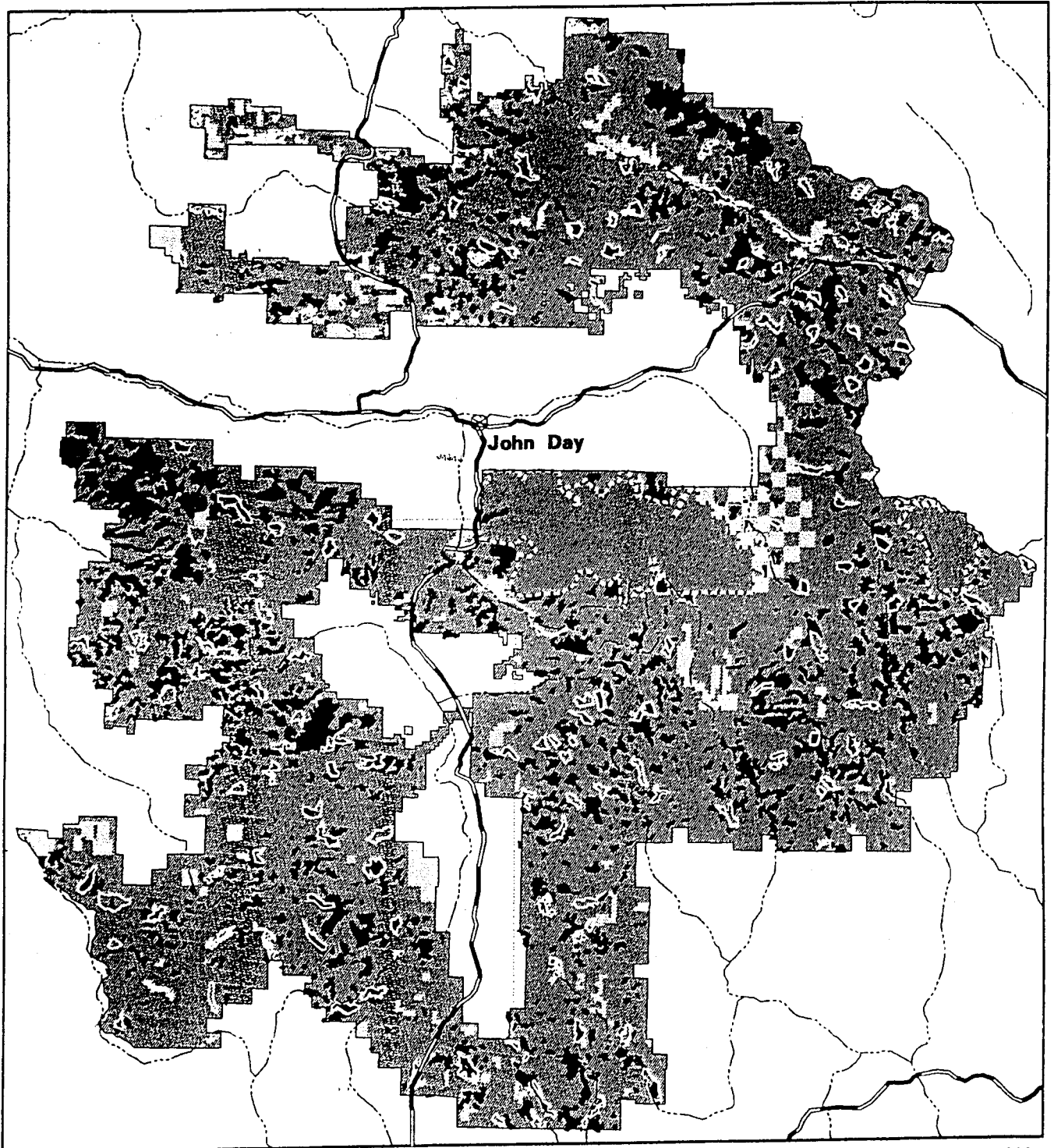
Northern Ochoco National Forest

Roadless Region Analysis - 1993



Eastside Forests Scientific Society Panel








Malheur National Forest



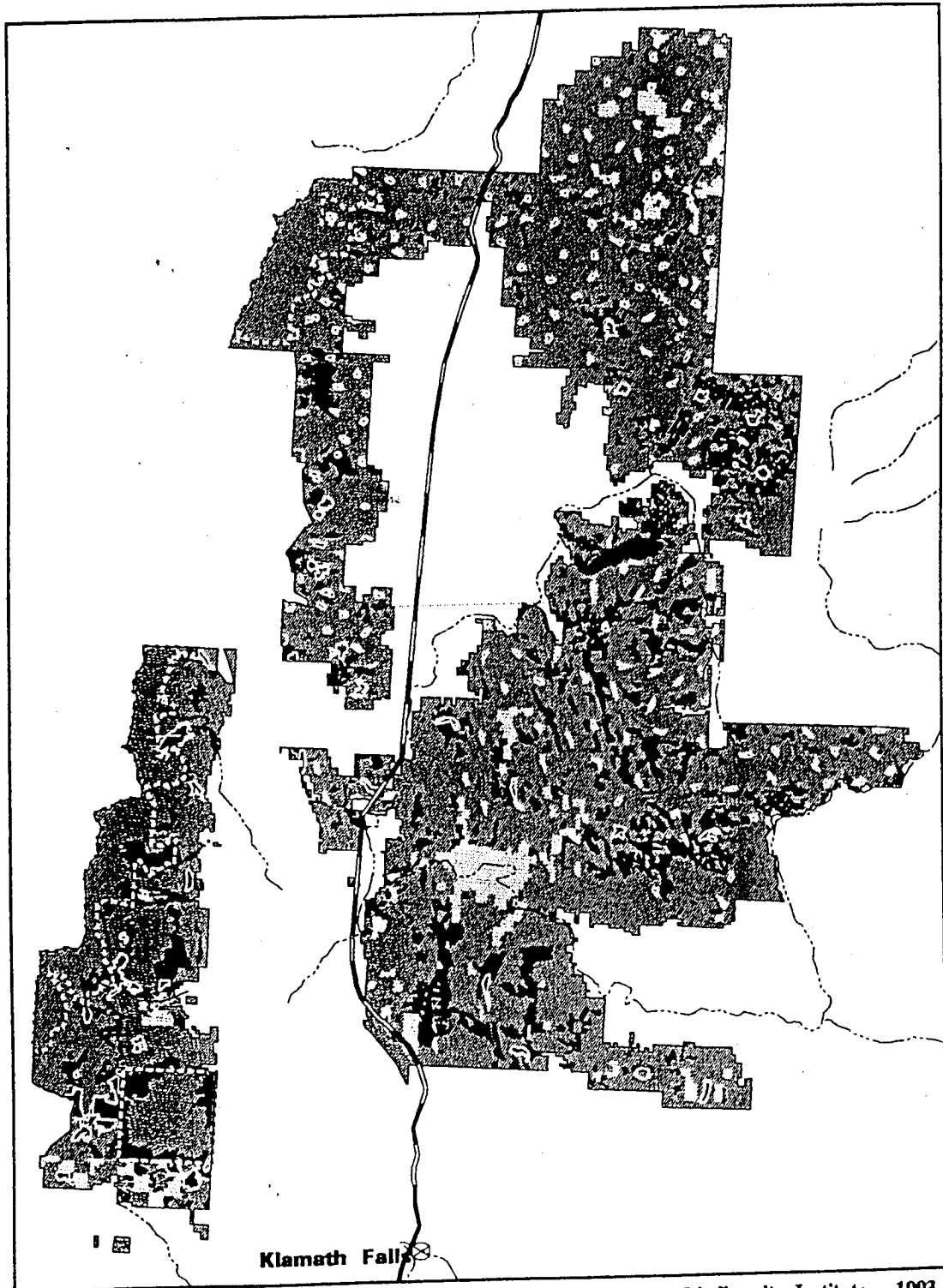
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
-  LS/OG: Forest Service/Audubon Coop Mapping (Wilderness unmapped)
-  Malheur National Forest Lands
-  Private Inholdings
-  Dedicated Old Growth Boundaries (white lines on black or gray)
-  Wilderness Boundaries (dotted white lines on black or gray)
-  Highways
-  Rivers and Streams

Eastside Forests Scientific Society Panel
 Winema National Forest



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1 inch = 11 miles

-  LS/OG: Forest Service/Audubon Coop Mapping (Wilderness partially mapped)
-  Winema National Forest Lands
-  Private Inholdings
-  Dedicated Old Growth Boundaries (white lines on black or gray)
-  Wilderness Boundaries (dotted white lines on black or gray)
-  Highways
-  Rivers and Streams