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Report of the Forest Practice Advisory Committee

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Introduction/Overview

The Oregon Plan for Salmon and Watersheds

The Oregon Plan for Salmon and Watersheds is conceived as a means to restore our native fish populations and their aquatic systems to productive and sustainable levels that will provide substantial environmental, cultural, and economic benefits.

The success of the Oregon Plan rests on the efforts and contributions of all Oregonians. Given the breadth of the undertaking, accomplishing its goals requires cooperation across the entire economic and geographic spectrum of the state. The Oregon Plan needs an engaged public concerned about the fate of the salmon and our watersheds. A cooperative undertaking, it melds the efforts of state, local, federal, tribal and private organizations, landowners and individuals.

Although it rests on a strong foundation of protective regulations, the Oregon Plan transcends regulation and encourages non-regulatory efforts to improve conditions for salmon and water quality. Some of the most important contributions to the Oregon Plan have been accomplished by private and quasi-governmental actions through watershed councils and voluntary restoration and enhancement activities.

The Oregon Plan spans the range of land uses and activities impacting salmon and water quality, including forest management, agriculture, fisheries, water management, hatchery management, industry and urban development. Governor Kitzhaber recognizes each of these interests and the roles of state agencies to achieve the goal of the Oregon Plan in his Executive Order No. EO 99-01 on the Oregon Plan for Salmon and Watersheds (Appendix 1). Many efforts have been launched to contribute to the Oregon Plan including watershed council plans and projects, Oregon's S.B. 1010 process dealing with the effects of agricultural practices on water quality, and forestland owner voluntary contributions. This report focuses entirely on commercial forest operations and forest practices.

The Ad Hoc Forest Practices Advisory Committee on Salmon and Watersheds

In the spirit of the Oregon Plan and in accordance with Governor Kitzhaber's Executive Order No. EO 99-01, the Board of Forestry created a diverse committee of Oregonians. The committee was charged with: (1) determining what, if any, changes to forest practices, both regulatory and voluntary, are necessary to meet water quality standards and to protect and restore salmonids; and (2) making specific recommendations to the Board of Forestry. The committee's Charter (see Appendix 1) sets forth its background and purpose, parameters and assumptions, charge from the board, membership, and roles and responsibilities.

The Ad Hoc Forest Practices Advisory Committee has thirteen members representing a diverse group of Oregonians who care deeply about our salmon and watersheds; small and large forest landowners, environmental and sports-fishing organizations, logging and commercial fishing interests, local government, and labor unions. The Committee met for a year and a half beginning in January 1999. The members include:

Ron Cease, Chair, Hatfield School of Government, Portland State University
Geoff Pampush, Oregon Trout
Dan Newton, Oregon Forest Industries Council

Paul Ketcham, Portland Audubon
Gary Springer, Oregon Small Woodlands Association
Bill Arsenault, Oregon Small Woodlands Association
Paul Heikkila, Commercial Fishing/OSU Sea Grant Extension
Bill Street, Labor/Machinist Union
Liz Hamilton, Northwest Sportsfishing Industry Association
Blake Rowe, Oregon Forest Industries Council
Sue Cameron, Oregon Counties
Tom Hirons, Associated Oregon Loggers
Mary Scurlock, Pacific Rivers Council

Committee members examined the scientific literature and monitoring results and heard from scientists and policymakers. They received and reviewed a report on forest practices from the Independent Multidisciplinary Science Team (IMST), a distinguished team of scientists that was established by the legislature to analyze and recommend the scientific basis for the Oregon Plan. The committee deliberated on a series of issue papers, sought scientific review of the issue papers, and debated options to achieve objectives relating to fish passage, landslides, roads, landscapes, and riparian functions. The issue papers were organized in a manner to help the Board of Forestry consider scientific, operational, economic and policy issues. The papers set forth a large number of options that were developed and considered by the committee.

Committee members traveled to both the eastern and western sides of the state where they examined forest sites, streams, riparian areas and watersheds, considered fish, water quality and forest management needs, gained a deeper understanding of the scientific issues, operational constraints, tradeoffs and discussed their points of view.

They met a total of 29 days with the first public meeting on January 14, 1999 and their last meeting on June 9, 2000. The meetings were long, often difficult, and thought provoking. Members devoted a significant amount of time learning about the complex interactions between terrestrial and aquatic habitat and the effects on water quality. The full range of options considered is shown in the issue papers. Following lengthy deliberations, the committee achieved consensus or strong agreement on 24 recommendations that included not only regulatory changes but also incentives and voluntary activities. On some recommendations, the views of individual committee members differed, and these differences are noted in the report.

The members of the committee believe their work is complete. The recommendations were supported by members of the committee in the spirit of making significant and positive contributions for salmon and watersheds. The committee members embarked on their task with the understanding that they were working to advance the Oregon Plan. The effort did not attempt to specifically address sufficiency for particular federal laws or regulations, such as the federal Endangered Species Act or Clean Water Act.

There are some follow-up actions that will need to be addressed by the Board of Forestry. These tasks are:

- Further exploration of incentives through the Board charging the Family Forestland Committee to explore and build on the incentive options developed by the FPAC.

- Directing the Department to work with interests in Eastern Oregon to develop riparian measures for eastern Oregon forests.
- Ensuring the rule proposals are supported by the findings required under ORS 527.714.

While there are often 13 different opinions among the committee members, it is fair to say that there are two dominant mindsets. These two mindsets reflect viewpoints regarding a range of issues and how facts are received and interpreted by the committee members. These two mindsets had differences in viewpoints about the desired future conditions, the acceptable levels of risk and the probability of adverse effects. There were also different views on the relative importance of unintended consequences - land use change, disincentives for doing management, and maintaining a viable forest-based economy. The facilitators, committee members, and staff worked diligently to create solutions that considered and balanced the range of viewpoints and that reflected a spirit of compromise.

Summary of Major Issues

In carrying out their charge, the committee chose first to review four major technical issues related to the protection and restoration of salmonids: fish passage, forest roads, landslides, and riparian function. With the September 1999 delivery of the IMST Report to the committee, a fifth issue, "Landscapes" was added for committee discussion.

Fish Passage

Movement of fish throughout a watershed is necessary for a number of life history needs. Upstream and downstream migration of juveniles during low summer flow is often needed so they can find suitable habitat (e.g. avoid warm water temperatures, find food, escape predators, avoid competition, etc.). During winter, juveniles may move upstream or into side tributaries and off-channel habitats to escape flood flows.

Upstream migration of juveniles has been observed related to the presence and availability of beaver ponds and other fish-rearing habitat. Upstream migration of adults is important for access to spawning grounds. Loss of fish passage at road crossings and other human-caused barriers has many potential effects, including loss of habitat access and changes in fish genetics or community assemblages. "Impediment construction" has been identified as a major factor leading to the decline of salmonids in western Oregon. Fish passage blockages are a problem for virtually every type of land use with many of the most important barriers for salmonids being found on public roads and highways.

Forest Roads

All streams under natural conditions have sediment inputs at varying levels from terrestrial sources (background levels) depending upon soil, topography, vegetation and rainfall. Sediment enters water through various processes that include soil surface erosion, channel erosion and mass movements (landslides, debris flows), and these inputs can be either chronic or episodic.

Studies have indicated that high sediment levels can affect fish by increasing mortality, altering habitat, reducing growth rates, causing physiological stress, impairing homing instincts, and reducing feeding rates. Historically, forest roads (as opposed to timber harvesting) have been the primary source of sediment from forest management activities in the western United States.

High risk factors for forest roads include road surface erosion, road fill failure, and the proximity and hydrologic connection of road segments to streams. Roads can also directly alter stream channels and fish habitat, especially when roads are constructed parallel to streams and within the floodplain.

Landslides

Landslides are the dominant processes for erosion on steep forested slopes in western Oregon and throughout the Pacific Northwest (Swanson et al., 1987). A landslide is the movement of a mass of soil, rock or debris down slope. The typical landslide on steep forestlands begins as a relatively small and shallow feature (typical dimensions of 3 feet in depth, 30 feet in width, and 40 feet in length), and can initiate debris flows (a semi-fluid mass scouring or partially scouring soils on the slope along its path). Upon entering stream channels, debris flows often carry large amounts of wood and are referred to as debris torrents. Landslides can be both beneficial and detrimental to aquatic habitat. For example, they can deliver needed large wood and gravel that will benefit aquatic habitat, but they can also deposit sediment that will clog spawning beds.

Forest practices may alter both physical and biological (vegetative) slope properties that influence slope stability and the occurrence of shallow rapid landslides. Physical alterations can include slope steepening, slope-water effects, and changes in soil strength. Most physical alterations are the result of roads and skid roads.

Riparian Function

Large wood, shade (stream temperature), bank stability, litterfall, sediment filtration, and floodplain processes are all riparian functions in forests. While some or all of these functions may be provided for either directly or indirectly by the current forest practice rules and Oregon Plan voluntary measures, large wood, bank stability and stream temperature are the primary functions that the rules and measures are designed to address.

Large wood (also referred to as large woody debris; coarse woody debris; large organic debris) is an important component of salmonid habitat. Large wood is a key factor in the development of channel form, including off-channel rearing backwaters, side channels, and pools and riffles, that are important for salmon. Large wood loading of streams has been correlated to winter survival of juvenile salmonids and can increase fish numbers within a given watershed. Reductions in large wood will often result in habitat simplification, which has been shown to reduce the diversity of fish species.

Stream temperature is an important component of fish habitat and has a direct effect on the growth and survival of salmonids. The effect on fish of changes in stream temperature varies between species and within the life cycle of a given species (DEQ 1995). Critical life stages that occur during the warmest months in the summer are of particular concern. The various physiological and ecological processes of salmonids that are affected by temperature are well documented. Exposure to temperatures above optimum levels has the potential to adversely affect salmonid survival and recovery. The presence of cool-water refugia can help salmonids avoid areas with adverse stream temperatures and help sustain a population of sensitive species. When ambient stream temperatures are too warm, sensitive aquatic species can inhabit these patches of cool water habitat. Deep pools, cool springs, subsurface flow, and the junction of cooler tributary streams are all examples of cool-water refugia.

Landscapes

The IMST Report includes recommendations of which most could be considered within Oregon's current policy and socio-economic frameworks. One of their two longer-term policy recommendations is that Oregon should develop a new policy framework to encompass landscape (large watershed) level within the range of wild salmonids in Oregon.

The IMST report recommends a number of landscape elements that the Committee considered (see Appendix 2- IMST Report). The committee devoted one full meeting to hearing scientific and policy information on this topic and discussing the issue of "landscapes." During this meeting the committee sought further advice from the IMST Chair about the landscapes' recommendation. Based substantially on input from the IMST Chair and the other participants at the meeting, the committee concluded that this was a longer-term issue outside the sphere of influence of the committee. Therefore, an issue paper was not developed on this particular issue and the committee chose to recommend that the issue be moved forward to other policy-making bodies, including the Board of Forestry, for future action. The recommendations include a number of specific actions to help facilitate the development of landscape approaches.

Incentives

The committee discussed many methods to implement its recommendations. Among these methods were a number of incentive-based efforts. However, the committee recognized that many of the incentive-based methods need further development and that additional ideas are needed to help balance the regulatory recommendations that it has proposed. Therefore, the committee recommends that incentives be further explored through the Family Forestland Committee being charged by the Board to explore and build on the incentive options developed by the committee.

Development of the Issue Papers

The committee developed an issue paper for each of the four major technical issues, outlining the current scientific findings, watershed-scale effects, a description and evaluation of current applicable voluntary and regulatory measures, and suggestions for possible additional voluntary and/or regulatory measures. Each paper was peer reviewed by a number of scientists from across the Pacific Northwest with expertise specific to the issues, and their comments were reviewed and utilized by the committee. The papers also included the analyses and recommendations of the Independent Multi-disciplinary Science Team related to the four issues. The papers served as the basis for evaluating the sufficiency of current voluntary and regulatory measures in maintaining water quality and protecting and restoring salmonids.

Out of these papers came a list of possible options designed to address those issues identified within the papers as opportunities to improve on existing measures. The committee spent many meetings discussing the four major issues and then developing and evaluating the various options under each issue. These papers serve as a permanent record of the breadth of technical information used by the committee in determining what specific recommendations were to go forward to the Board of Forestry.

Executive Summary
Forest Practices Advisory Committee on Salmon and Watersheds
Consensus and Strong Agreement Recommendations

The following is a summary of the recommendations that have received either "consensus" or "strong agreement" among committee members. "Consensus" support means all committee members present or represented by proxy at the meeting where the recommendation was discussed expressed support. "Strong Agreement" means no more than three of the thirteen-committee members expressed non-support. "Majority " support referenced in the body of the report means at least seven committee expressed support, but four to six committee members expressed non-support.

Fish Passage

Recommendation A: The forest practice rules should be revised to ensure that if an upstream reach has the natural capacity to be a fish-bearing stream but is currently a nonfish-bearing stream because of a stream crossing structure that cannot pass fish, the reach will be classified as a fish-bearing stream. The extent of potential fish use upstream of the blockage will be determined using guidance to be developed based on field fish presence surveys and interim criteria. *(See Option #1 under Fish Passage for more information)*

Recommendation B: Forest landowners should accelerate the identification, prioritization, and restoration of existing stream crossing structures (typically culverts) that currently do not pass fish on streams inhabited at any time of the year by anadromous or game fish species or fish that are listed as threatened or endangered species under the federal or state endangered species acts.

A new source of funding is necessary to encourage stream crossing repair work. The new funds could be generated based on forestland ownwership, on timber harvested, on acres harvested, on road miles, or through some other mechanism (a preference for a per acre assessment based on forestland ownership was expressed by the committee). Landowners could then apply for a credit against expenses incurred in voluntarily remediating legacy road and culvert problems. *(See Option #2 under Fish Passage for more information)* The funding mechanism would be phased out as landowners completed repair work.

Recommendation C: The forest practice rules should be revised to incorporate a physical habitat approach to designating fish use and non-fish use streams. ODF has developed interim classification guidelines to designate fish use based upon the physical characteristics of a stream. These guidelines were based upon fish presence survey data and could be used to classify streams that are fish use. The guidelines use either mapped or on-the-ground physical characteristics. The current stream classification rules would be amended to establish that fish use streams are any streams that meet the habitat criteria. The habitat criteria may need to be modified and improved based upon more recent and complete survey data. Key issues that will need to be addressed include the acceptable margin of error in applying a habitat model and opportunities for landowners to request field verification of habitat criteria. Fish presence survey

data, when available, will supercede the guidelines in designating fish or non-fish use. *(See Option #3 under Fish Passage for more information)*

Recommendation D: A funding source should be created for family forest landowners or the state should otherwise assist family forest landowners in obtaining funds from existing sources to expand the current voluntary road assessment effort to non-industrial private forestlands. This financial assistance would also be used to help family forest landowners replace stream crossings that are not adequately passing fish. *(See Option #4 under Fish Passage for more information)*

Forest Roads

Recommendation E: To address existing roads constructed using past practices or methods, such roads should be systematically evaluated and mitigated where appropriate for negative impacts or risks to:

1. Waters of the state;
2. Passage of juvenile/adult anadromous fish; and
3. Downstream passage of habitat elements.

"Other land-use" roads should use at least the same best management practices (BMPs) as required for forestlands.

The department should create specific road maintenance guidelines for high hazard locations, by developing and making available to operators and regulators improved guidance. The department should be given general authority to require additional cross drainage installation as a maintenance requirement prior to an operation when current road condition and a proposed use will impair water quality. *(See Option #6 under Forest Roads for more information)*

Recommendation F: Cross drainage structures on new roads should be installed so that the risk of sediment delivery to waters of the state from new roads is minimized.

While this is the current standard, department should provide better guidance and training for achievement of the rules. Current rules provide authority for installation and maintenance of road cross-drains. Training and improved guidance would be developed and implemented for operators/landowners and regulators that would emphasize the need for adequate spacing and the proper installation of road cross drains.

The forest practice rules should be revised to better clarify the objectives for cross-drainage. For example, the rules might state that the objectives are to ensure that cross drains are installed in adequate numbers and in proper locations so that:

1. Road surfaces are protected from erosion and water retention;
2. Erosion of the roadside ditch is minimized;
3. Ditch water is not discharged onto unstable slopes; and
4. The amount of ditch water (and associated sediment) discharging directly into a stream is minimized. *(See Option #7 under Forest Roads for more information)*

Recommendation G: The forest practice rules should be modified to more specifically address wet-weather hauling. This should include development of two criteria, probably in rule form, to:

1. Address road use in wet weather to ensure that durable surfacing or other effective methods are used on road segments that can deliver sediment to streams; and
2. Require operators to cease heavy truck traffic on roads when the road surface is breaking down (only for segments that are delivering sediment to streams). "Breaking down" would be defined by both depth of ruts and by depth of muddy fine sediment on the road. *(See Option #8 under Forest Roads for more information)*

Recommendation H: The department should develop clear decision-making criteria for evaluating proposed road locations in areas where there is a high risk of landslides, surface erosion, or of direct physical alteration to streams, riparian areas, lakes or wetlands. The criteria should identify preferred locations and construction practices that will result in roads being constructed in a manner that results in the lowest overall impact to water quality and fish habitat while allowing the landowners to achieve their management objectives (Method 5). The criteria should also direct the Department of Forestry to not approve road construction or reconstruction in the sensitive areas described above, if viable alternatives exist. *(See Option #10 under Forest Roads for more information)*

Recommendation I: Means should be developed or provided for the movement of large wood and sediment downstream at those crossings which may otherwise restrict movement. The transport mechanisms for large wood and sediments may be either stream storm flows or channelized debris flows. *(See Forest Roads Option #12 for more information)*

Recommendation J: Improved cooperative road system planning, maintenance and use is needed between federal and private forest landowners. *(See Option #16 under Forest Roads for more information)*

Recommendation K: Future forest road best management practice compliance and effectiveness monitoring should be implemented within the context of the Forest Practices Program's strategic monitoring plan and prioritized in context with available monitoring resources and other monitoring needs *(See Option #18 under Forest Roads for more information)*

Recommendation L: Additional training on forest road construction and maintenance should be provided for landowners and operators. *(See Option #19 under Forest Roads for more information)*

Recommendation M: The forest practice rules should be changed to require prior approval for ground based harvesting on steep slopes where there is a significant risk of sediment delivery to streams. *(See Option #57 under Forest Roads for more information)*

Recommendation N: A road closure program should be developed that forest landowners, the Department of Forestry, and local law enforcement can use to limit public access onto sensitive road systems that have a high risk of delivering sediment to streams, or that directly impact aquatic habitat. (*See Option #59 under Forest Roads for more information*.)

Landslides

Recommendation O: All landslide prone locations (now called "high risk sites") should be identified prior to timber harvest operations. During the notification process, the department should inform the operator of the likely presence of high risk sites in the operation area, based on coarse screen maps. The operator would then be expected to more specifically locate sites within the operation area by field reconnaissance. There is also the expectation that "significant" areas of high risk sites which are not mapped will also be identified by the operator. *(See Option #45 under Landslides for more information)*

Recommendation P: The department should identify stream channels which are prone to debris flows and torrents. Identifying those channels which are capable of transporting large wood to Type F streams could make it possible to focus riparian prescriptions on those streams where greater benefit to aquatic habitats are likely.

The department should inform the operator during the notification process of the likely presence of debris flow prone channels, based on coarse screen maps. The operator would then be expected to more specifically locate debris flow prone channels by field reconnaissance. ODF would provide specific criteria to be used in field identification. *(See Option #46 under Landslides for more information)*

Recommendation Q: The locations most prone to landslides (now called "high risk sites") should be managed with techniques that minimize impacts to soil and water resources.

To achieve this objective, the best management practices used to protect high risk sites that are currently in guidance should be incorporated into the forest practice rules (Method 1) and a better case history basis for evaluating the effectiveness of those practices should be developed (Method 6). These standard practices are designed to minimize ground alteration/disturbance on high risk sites from logging practices. *(See Option #47 under Landslides for more information.)*

Recommendation R: It is important to leave trees or downed wood in locations where they provide wood to be moved by debris flows into fish-bearing streams.

To achieve this objective, it is realistic or appropriate to use a menu of potential methods to leave trees or downed wood, depending upon likelihood of wood delivery and operational efficiency. It is not appropriate to rely on a single strategy to provide this potential source of large wood. The operator should be required to select an appropriate option in cooperation with ODF. *(See Option #61 under Landslides for more information.)*

Riparian Functions

Recommendation S: The active placement of large wood or other structure in streams deficient in wood or other structure is necessary for short-term aquatic habitat improvement, but it should be done in a manner that still assures the timely achievement and maintenance of characteristics of mature forest conditions in the riparian management area in the longer term. A menu of methods should be developed to prioritize and guide placement of large wood. This

menu should include as one method placing wood along streams during an adjacent entry for harvesting. *(See Option #20 under Riparian Functions for more information)*

Recommendation T: Additional department resources should be allocated to monitoring the effectiveness of the water protection rules. At a minimum, current levels of monitoring must be maintained. Adequate resources should also be provided to enable the department to conduct effectiveness monitoring related to the large wood objectives of the Oregon Plan for Salmon and Watersheds and water quality standards, as well as continued best management practices compliance monitoring. Coordination with other agencies on monitoring projects is essential. *(See Option #30 under Riparian Functions for more information)*

Recommendation U: The State of Oregon should develop a clearer and more comprehensive policy on riparian management that addresses all land uses. The committee did not discuss whether such a policy should require uniform protection on all land uses. However, the policy should, at a minimum, establish a baseline standard for resource protection and both clarify and explicitly describe Oregon's expectations for different land uses if some land uses will be required to meet a higher protection standard than others. *(See Option #41 under Riparian Functions for more information)*

Recommendation V: The following list of changes are recommended to increase the protection and restoration of riparian functions. Further clarification and/or guidance on a number of these points will be needed to further develop these concepts.

1. Harvesting Cap 40%
   In western Oregon, manage any harvesting within the RMA so that the retained conifer basal area exceeds the basal area standard target, or 60 percent of the pre-harvest basal area, whichever is greater.

2. No Touch area½ of RMA
   The no-touch width will be equal to one-half the width of the entire RMA.

3. Largest Trees 10 out of 20 largest
   Retain 10 of the 20 largest trees per 1,000' outside of the no-touch width that will best achieve aquatic riparian functions. Subject to FPF approval, the landowner would identify tree locations in a written plan demonstrating how this objective will be met. There would be discretion to also consider operational issues and the value of the trees, as long as best achieving aquatic riparian functions remains the primary objective.

4. Type N Streams FPF discretion
   a. Small Type NT streams are: 1. Perennial Small Type N (temperature) streams that are tributary and contribute at least 30% of the flow to small and medium Type F streams and that have a drainage area larger than X acres (basin size to be set be georegion, 40 acres for the coast range). Initial classification will be based on basin size, but landowners may delist streams or stream segments verified as non-perennial. 2. Small Type N (torrent) streams with drainage basins greater than 30 acres, in which more than 75% of the basin has been mapped as "high" or

50% “extreme” debris flow hazard (by the State Forester) and which have a high probability of wood delivery to Type F streams.

b. Small NT stream protection: 1. Up to the first 500 feet of Type NT (temperature) stream above the confluence with a Type F will have a 50 foot search zone, each side. Within the search zone, retain 4 square feet of trees per each 100 feet of perennial flow (up to 500’) and all non-merchantable conifer on each side of the stream. Trees left along these streams to satisfy the basal area requirement can be counted as in-unit leave trees. 2. “Torrent” type NT streams will be protected as follows - FPF, working with the landowner, has discretion to direct retention of in-unit trees to 50 x 500’ search zone (each side).

5. In-growth 25% adjustment for small streams
The standard target will be recalculated for small Type F streams using the same per-acre basal area as large streams, minus 25 percent for in-growth. The standard target will also be recalculated for medium Type F streams, using the same per-acre basal area as large streams.

6. Riparian Specialist
The Oregon Department of Forestry will designate a riparian specialist in each administrative area who will be available to inventory and prepare riparian prescriptions for landowners, at their request. These specialists will be new positions funded by funds other than the harvest tax.

7. Similar Prescriptions for All Large and Medium Streams
Large and medium Type N stream prescriptions will be the same as the equivalent size Type F.

8. Monitoring
The effectiveness of the small Type N stream prescription will be a monitoring priority.

9. Alternative Vegetation Retention Prescriptions
The existing alternative vegetation retention prescriptions (e.g., hardwood conversions) may be applied to all riparian management areas (RMA’s).

10. Preventing Sediment Delivery
The purpose statement for harvesting rules will be modified to better describe the objective of preventing sediment delivery to channels. The current requirement not to locate skid trails within 35 feet of Type F or D streams will be extended to all streams. Skid trails will be defined as an excavated trail used to yard logs with more than one turn.

11. Measurement of Riparian Management Area/Channel Migration Zone
The riparian management area (RMA) will be measured from the current points of measurement except for areas designated by the State Forester as a channel migration zone (CMZ). A CMZ is an unconstrained reach of stream that in the judgment of the forester is likely to have channel movement that can go outside the RMA widths within the period of a rotation (50-100 years). Within the CMZ, the no touch area will be

measured from the high water mark of the channel (same as current rules). The outer edge of the CMZ will be based upon guidance to be developed by a technical committee. Retained trees in the CMZ shall be no less than the basal area standard target.

12. Type N and Small Type F Streams: Landowners would get credit for in-unit leave trees.

13. Conceptual agreement about the use of "stratification."
In recognizing that riparian stands are not homogenous and that applying a single target for the RMA can prevent appropriate management in patches with conifer "over" stocking, agreement was reached on the concept of stratification. The details of how to do it in the field are to be developed. Stratification could allow an RMA to be divided into segments with a different management approach applied to each segment; based on the specific conditions in the segment.

14. "Provide for placement of large wood" is supported as a concept.
(See "Subcommittee" Riparian Option under Riparian Functions for more information)

Landscapes

Recommendation W: The Board of Forestry should ask the Governor to:

- Convene a collaborative process for landscape scale approaches to protect and recover salmonids and provide and protect clean water across land uses and ownerships:

    1. Identifying and evaluating current policy frameworks and scientific findings related to landscape management;
    2. Developing common protocols for watershed assessment and monitoring;
    3. Review existing and proposed watershed assessment protocols and recommend a means to achieve an effective assessment;
    4. Identifying research needs, regulatory and non-regulatory policies, and technical methods to support landscape scale approaches; and
    5. Improving cooperative approaches and partnerships among local, state, and federal governments and private landowners.

- Strengthen "Oregon Plan for Salmon and Watersheds" support for basin and watershed scale assessment, collaboration, and restoration by:

    1. Linking funding support for OWEB projects to basin and watershed priorities and those projects that are supportive of the goals of the Oregon Plan;
    2. Increasing long term financial support for watershed councils and coordinators;
    3. Boosting funding to state agencies to enhance technical support to watershed councils and restoration activities of watersheds;
    4. Setting priorities, where possible, according to the identification of limiting factors on fish runs;

5. Assembling a local/state/federal team to solve watershed and landscape level problems that involve multiple governmental agencies. The team would recommend positive changes to reduce/eliminate duplication, do away with actions that are counter to the Oregon Plan, and improve communications. Where appropriate, non-governmental representatives should be included; and
6. Ensuring the long term viability of the Oregon Plan by implementing Executive Order EO99-01.

- Support increased funding for scientific research and the establishment of a natural resource research institute to address landscape/watershed scientific questions and Oregon Plan policy issues using a multi-disciplinary approach; and

- Strengthen policies to encourage maintenance of the forestland base and increase it through afforestation of suitable lands since forests provide the best and most essential habitat components for salmonids.

Recommendation X: The Board of Forestry should:

- Include the policy objectives of the Oregon Plan for Salmon and Watersheds as part of its next revision of the Board's strategic plan, *The Forestry Program for Oregon*;

- Investigate, develop, and promote incentives--such as expanding the federal Conservation Reserve Enhancement Program, providing financial assistance, using forest stewardship plans, and easing anti-trust restrictions—so as to encourage forest landowners to encompass broader landscape goals in their management plans; and

- Continue to investigate and analyze forest conditions across the landscape through:

  1. The Department of Forestry's Forest Assessment Project which has forged partnerships with Oregon State University and the Pacific Northwest Research Station; and
  2. Data and models developed in other projects such as the Umpqua Land Exchange and the Sierra Nevada Project.

Discussion of Consensus and Strong Agreement Recommendations

The committee identified and discussed over 60 recommendations. All of these recommendations are identified and discussed in each of the four issue papers (see Sections A – D). For the recommendations with consensus or strong agreement, this section provides detailed information about the recommendation, including its objective, methods for implementation, its benefits and costs, and resources needed for implementation.

Fish Passage Option #1: Riparian Functions Above Fish Impassible Stream-Crossing Structures

Objective:

To provide for riparian functions along stream reaches above fish impassable stream-crossing structures that have a high probability of recolonization by salmonids once the structure is replaced/improved.

Recommendation:

The Committee reached a consensus that the forest practice rules should be revised to ensure that if an upstream reach has the natural capacity to be a fish-bearing stream but is currently a nonfish-bearing stream because of a stream crossing structure that cannot pass fish, the reach will be classified as a fish-bearing stream. The extent of potential fish use upstream of the blockage will be determined using guidance to be developed based on field fish presence surveys and interim criteria.

Additional information on this option:

- In the future, when the barrier is removed, a process that field-verifies reoccupation and establishes the actual end point of fish is desirable and should be planned for. Such a survey could be conducted a set number of years after the barrier removal occurs.
- The Oregon Fish and Wildlife Commission and the Oregon Board of Forestry have entered into a Memorandum of Understanding which affirms the Board's role and the ODF's role in ensuring fish passage is provided when roads are constructed, reconstructed, or maintained in conjunction with commercial forest operations; and specifies under what conditions the statutory requirement to maintain fish passage may be waived by Oregon Department of Fish and Wildlife staff for activities associated with commercial forest operations regulated under the Oregon Forest Practices Act.
- **IMST recommendation #15** calls for culverts and other structures to be modified to permit the passage of juvenile and adult salmonids upstream and downstream at forest road-stream crossings.

Benefits:

The most important benefit of this recommendation is that reaches of a stream that may be reoccupied by fish once a barrier is removed will have retained vegetation to facilitate reoccupation and help maintain and restore good fish habitat over time. Increased riparian vegetation retention could, over time, help to maintain or improve water quality. This option could also remove a disincentive to replace a barrier in a timely manner. It may also remove an incentive to harvest a reach above the barrier before replacement. The option also eliminates an unfair dichotomy about how streams are classified. Currently, if fish presence surveys have not been conducted above a culvert, then the interim guidelines are applied and the appropriate reach above the culvert is treated as a Type F stream. If fish presence surveys have confirmed the absence of fish above a barrier, than the entire stream above the barrier is treated as a Type N stream.

Costs:

Landowners/Operators:	Significant, potentially high for some landowners.
State Government:	Potential reduction in harvest and income tax revenues.
Local Governments/Communities:	Potential reduction in tax and income tax revenues.

Additional harvest restrictions will be imposed for those stream reaches with a classification change from non-fish to a fish-bearing stream. Given the relatively large number of stream crossing structures that determine the end of fish use, the length of streams affected could be relatively significant. Based on current RMA widths, one additional acre of forestland would incur total or partial timber harvest restrictions for each 436 feet segment of small stream length reclassified as fish-bearing. Landowner costs, primarily in terms of reduced timber revenues, will be increased. Costs will vary significantly among landowners, and for some the cost could be significant. The actual costs will depend upon the stream length and the level of protection required. This option might also create a potential conflict between upstream and downstream neighbors (for example: where a downstream landowner is reluctant to replace the culvert, while the upstream owner is required to provide Type F stream protection).

Resources needed:

Rulemaking required

Administrative actions required.

A quantitative cost assessment to identify acreage and timber values impacted by this option is needed.

Some form of tracking system will be needed to maintain the identity and location of stream crossing structures that are the end of fish use. In general, these data are available for completed surveys, but not for channels that have not yet been surveyed. Current stream classification maps could be used for this purpose. The interim classification guidelines should be reassessed as part of this process, and may need to be modified. This assessment would be based upon the additional survey information that has been collected since the original guidelines were developed.

Fish Passage Option #2: Restoring Fish Passage at Existing Forest Road Stream Crossings

Objective:

To facilitate the identification, prioritization, and restoration of existing stream crossing structures that currently do not pass fish.

Recommendation:

The committee reached a consensus that forest landowners should accelerate the identification, prioritization, and restoration of existing stream crossing structures (typically culverts) that currently do not pass fish on streams inhabited at any time of the year by anadromous or game fish species or fish that are listed as threatened or endangered species under the federal or state endangered species acts.

Twelve committee members (WS, DN, RC, BA, GS, SC, GP, BR, LH, PK, PH, MS) support the creation of a new revenue source to encourage stream crossing repair work. The revenue source could be generated on forestland ownership, on timber harvested, on acres harvested, on road miles, or through some other mechanism (a preference for a per acre assessment based on forestland ownership was expressed by the committee). Landowners could then apply for a credit against expenses incurred in voluntarily remediating legacy road and culvert problems. (Method 4). This method was initially developed by the committee members representing OFIC and their support of the method was subject to the following five conditions:

1. It being part of a final package of consensus proposals recommended by the Forest Practices Advisory Committee to the Board of Forestry.

2. Agreement among industrial and non-industrial forest landowners on an acceptable taxing mechanism to present to the Legislature as soon as possible.

3. Agreement on a non-bureaucratic, easy-to-administer, landowner-friendly reporting process to certify tax credit-eligible remediation projects. For example, the tax credit form could be the Oregon Watershed Enhancement Board Reporting Form (appropriately modified if needed), with project acceptance by the Department of Forestry and financial audit by the Department of Revenue.

4. When/if the Department of Forestry certifies that remediation of legacy road and culvert problems on a given ownership or ownership block is not needed, or has been completed and no further work is needed, additional taxes for this purpose associated with such ownership would not be assessed.

5. This method replacing and not be in addition to other methods considered under this option (Methods 1, 2, and 3).

Seven committee members (RC, GP, BA, SL, MS, LH, PK) support requiring landowners to inventory fish passage barriers and that such barriers be repaired within a specified time period. The survey could be required over a four-year period and the remediation of fish passage problems completed over a ten-year period (Method 2). Other committee members believe Method 4 is a preferable mechanism to achieve the option objective. It was also pointed out that many landowners are already doing this work voluntarily under the Oregon Plan on very similar timelines. Other landowners may need financial assistance to implement this method.

Six committee members (GP, RC, SC, JS, PK, LH) support requiring that fish passage be restored for any culvert on a road that is within an active harvest operation within one-year after completion of the harvest (Method 1). Other committee members opposed this method as an arbitrary constraint on a landowner's ability to prioritize work, i.e. the highest priority culverts are not necessarily associated with active harvesting. Focusing limited funds on harvest units means higher priority work will not be done. One member stated that the application of this method should be limited to "core areas" or other critical areas.

Four committee members (RC, SC, LH, PK) support the creation of a support service within the ODF for road assessment information. This non-regulatory service would catalog potential fish passage culverts and aid in design standards and in obtaining stewardship grant money, if needed (Method 3). One committee member suggested that the method collect data on a watershed basis. Another member said this method could not stand alone and would have to be combined with other methods. A third member suggested that cataloging may be less important than other tasks, such as aiding in design standards, and implementation and compliance with written plans. Other committee members opposed establishing major new data collection and management function for the department. They also stated such a process should be driven solely by landowner demand for the service. It was also not clear how this method would support the highest priority repair work getting done.

Additional information on this option:

- A large number of stream crossings in Oregon currently do not pass juvenile and adult fish up and downstream.
- Protocols for road assessments have been developed, as have criteria for fish passage. Recent training efforts have been implemented to improve the technical understanding of the design criteria.
- When culverts are replaced on Type F streams under existing rules, written plans are required and some level of design review service is provided for forestlands.
- New or replaced culverts on Type F streams are required to pass both adult and juvenile fish.
- Many landowners are participating with watershed councils to help establish restoration priorities and facilitate grant writing.
- Through the Oregon Plan, OFIC landowners statewide have already implemented a voluntary program to identify risks from roads and to address those risks. The objectives of this program are to:
    1. Implement a systematic process to identify road related risks to salmon and steelhead recovery;

2. Establish priorities for problem solution; and
3. Design and implement actions to reduce road related risks.

- This option is aimed at accelerating culvert replacement above what is currently being done, especially for family forest landowners who often do not have adequate resources to address this issue.
- There are a number of different ways to implement this option. Either a rule-based or voluntary approach could be used.
- For Method 3, there are a number of possible ways of providing a "service" to support road assessment and mitigation. Information could be forwarded to Watershed Councils to be incorporated into watershed assessments and action plans.
- The Method 4 tax program would remain in effect for no more than ten years -- the original time line anticipated for the voluntary legacy roads and culverts commitment made by OFIC landowners. Owners of private forestland who are not OFIC members could choose to either pay the tax or receive a tax credit by addressing legacy problems on their land. Tax revenues collected that are not "refunded" through the tax credit program would be deposited in a special account within the state's watershed enhancement fund. Revenues in the special account would be used exclusively to address legacy road problems on forestland.
- If Method 4 was based on a harvest tax, a sufficient carry-forward and carry-back provision would be included to ensure that infrequent harvesters could take advantage of the tax credit.
- Method 4 could be further developed to address sedimentation issues in eastern Oregon, while focusing on fish passage issues in western Oregon.
- Related issues to this option include the occurrence of forest roads where the maintenance responsibility involves more than one party and poorly maintained public roads that cross private property.
- **IMST recommendation # 15** calls for culverts and other structures to be modified to permit the passage of juvenile and adult salmonids upstream and downstream at forest road-stream crossings.

Benefits:

Method 1: Linking fish passage restoration activities to an active harvest operation would accelerate culvert replacement and tie restoration timing and location to activities that produce revenue.

Method 2: Requiring inventories and remediation activities within a specified time period provides for some flexibility for the landowner.

Method 3: Creating a support service will aid in the tracking of culvert work progress and provided assistance to landowners that lack adequate resources, specifically family forest landowners. This will also potentially aid in the prioritization of culvert work for watershed councils and allow for the more efficient use of limited resources.

Method 4: This tax brings fish passage to every landowner's attention. It rewards actual work and allows exemption when work is complete. This program could be expanded to other land uses.

Costs:

Landowners/Operators:	Significant, potentially high for some landowners. Short- and long-term costs will be increased for landowners with some of these approaches. A key factor in determining costs to a individual landowner will be the number and type of stream crossing structures on their ownership currently not adequately passing fish. Method 1: Linking fish passage restoration activities to an active harvest operation may draw resources away from other higher culvert and road priorities. This would require shifting landowner resources from other actions that may have greater benefits to fish. Method 3: ODF will need additional resources to build and maintain a support service for road assessment information and the personnel necessary to manage such a service. It isn't clear how the data might be used to improve outcomes over current systems. Method 4: A well designed tax program would result in low or no increase in taxes for landowners who aggressively address fish passage barriers on their ownership.
State Government:	Potentially significant administrative costs to implement Methods 3 and 4. Methods 1 and 2 may also increase costs for monitoring and evaluating stream crossing improvements.
Local Governments/Communities:	Insignificant, except as a forest landowner.

Resources needed:

New or amended rules and/or legislation will be needed, as well as resources to monitor the completion of stream crossing inventories and the effectiveness of the repairs to fish passage barriers. Multi-land use inventories of problem culverts and relative length of habitat above the problem barrier could be needed for some methods. Resources to coordinate restoration efforts through ODF, ODFW or a watershed council are needed. For some methods, funding may be needed to assist family forest landowners.

Fish Passage Option #3: Classifying Fish Use Streams Based on Physical Habitat Criteria

Objective:

To provide a more effective and efficient means of classifying streams for "fish use."

Recommendation:

Twelve of the 13 committee members (RC, BA, DN, BR, GS, WS, SC, MS, PH, GP, PK, LH) recommend that the forest practice rules be revised to incorporate a physical habitat approach to designating fish use and non-fish use streams. ODF has developed interim classification guidelines to designate fish use based upon the physical characteristics of a stream. These guidelines were based upon fish presence survey data and could be used to classify streams that are fish use. The guidelines use either mapped or on-the-ground physical characteristics. The current stream classification rules would be amended to establish that fish use streams are any streams that meet the habitat criteria. The habitat criteria may need to be modified and improved based upon more recent and complete survey data. Key issues that will need to be addressed include the acceptable margin of error in applying a habitat model and opportunities for landowners to request field verification of actual fish presence. Fish presence survey data, when available, will supercede the guidelines in designating fish use.

This recommendation does not address the level of protection that should be provided to different types of streams. Some members supporting this option do not endorse using fish use as the main determinant of riparian protection levels.

Additional information on this option:

- The current water classification scheme is based on the presence or absence of fish. The survey process to determine presence/absence is time-consuming, limited to a short season, and requires significant funding ($500,000 per biennium, although costs are relatively low compared to the resources that may or may not be retained based upon the results).
- ODF funded 22 survey crews in 1998 and 14 in 1999; however budget shortfalls prevented the fielding of any crews in 2000.
- Fish presence surveys are becoming more restricted due to the listing of fish under the federal ESA.
- The surveys also provide useful information to identify barriers to fish passage, identify unmapped stream channels, identify restoration opportunities, and create a baseline of fish distribution information. However, surveys can produce unreliable results when fish populations are depressed or there are other environmental factors such as drought or extreme flows.

- The survey-based approach potentially reduces the amount of fish habitat maintained over time. This can occur where salmonid habitat in a given stream reach may not be maintained as well as it might under a Type F classification over time because fish were not present at the time the fish survey was conducted.

- Data indicate that models used to predict fish use in gentle topography have better predictive ability than models applied in steep topography. In either case, a policy choice must be made concerning the acceptable predictive ability. A more conservative model (error on the side of over-predicting fish habitat) may be acceptable since the rules would also have a process to field survey at the initiative of the landowner.

- Stream reaches capable of supporting fish above impassible stream crossing structures would be classified as Type F under Fish Passage Option #1.

Benefits:

This recommendation will potentially increase the amount of habitat available to salmonids over time by requiring the maintenance of riparian management areas in stream reaches that may have historically supported salmonid populations. Funds currently used to conduct the surveys can be partially allocated to other needs/activities. The recommendation may reduce classification problems resulting from survey errors or other survey biases. The recommendation provides an option if the listing of fish precludes the use of efficient survey methods (electroshocking).

Costs:

Landowners/Operators:	Significant, but highly variable among landowners.
State Government:	Insignificant, if existing funding for fish presence surveys is maintained and reallocated. Potential reduction in harvest and income tax revenues.
Local Governments/Communities:	Potential reduction in tax and income tax revenues.

Landowner costs will potentially be increased since additional harvest restrictions will be imposed for those stream reaches where there is a stream classification change from nonfish-bearing to fish-habitat. The other values of the surveys such as identifying barriers to fish passage, unmapped stream channels, and creating a baseline of fish distribution information will be lost. Modeling error could result in either inadequate protection for some fish-use streams or unnecessary costs to landowners.

ODF fielded 13 survey crews in 1999. Budget reductions will result in no Forest Practices Program funds for fish presence in 2000.

Resources needed:

Administrative actions and potential rulemaking required.

A quantitative cost assessment to identify acreage and timber values impacted by this option is needed.

The interim classification guidelines will need to be reviewed and revised to develop predictive models for fish use. Agreement will be needed about the acceptable error rate. Classification maps will need to be updated. A choice will also need to be made when the classification change would occur and whether ODF, ODFW or the landowner will physically survey the stream or apply the mapped-based approach. The choice might well be different based upon topography or region. Resources to provide for an appropriate level of field and guideline verification are necessary.

Fish Passage Option #4: Funding Source for Family Forestland Road Assessments and Stream Crossing Replacements

Objective:

To identify and restore fish passage on family forestlands.

Recommendation:

Eleven committee members (PK, MS, RC, LH, SC, GP, BA, WS, GS, PH, TH) recommend a funding source be created for family forest landowners or that the state otherwise assist family forest landowners in obtaining funds from existing sources to expand the current voluntary road assessment effort to non-industrial private forestlands. This financial assistance would also be used to help family forest landowners replace stream crossings that are not adequately passing fish.

Two members could not support this option objective unless the incentives applied to all forest landowners.

Eight members (RC, LH, PK, SC, BA, BR, GS, WS) support the establishment of a capital investment loan program like the Forest Resource Trust that would provide a low cost loan to family forest landowners for road and culvert repair that would be repaid at the time of a harvest (Method 4). Some members were skeptical that General Funds would be available for this method and that another source would need to be identified.

Seven members (PK, RC, LH, MS, SC, GS, BA) support providing a tax credit for culvert restoration for the next ten-year period that would provide a credit for replacement of culverts that would restore "high" priority habitat (Method 1). One member was concerned that the tax credit remain less than 100 percent. Another member questioned whether the tax credit would motivate new or different restoration efforts and was concerned that otherwise bad stewards could still be rewarded. Two members could not support this option objective unless the incentives applied to all forest landowners.

Seven members (RC, SC, GP, MS, BA, GS, WS) also support establishing a combined account for culvert replacement utilizing earmarked Ballot Measure 66 funds, ODFW Restoration and Enhancement funds, a new fishing license surcharge, public and landowner contributions, and/or federal funds (Method 3). The sources and proportions of source funds raised questions and concerns by some committee members. Two members could not support this option objective unless the incentives applied to all forest landowners.

Five members (SC, BA, RC, GS, WS) support floating a bond issue that would be repaid with Ballot Measure 66 funds to provide a specific account for culvert replacement (Method 2). The committee members expressed concerns and questions regarding mechanisms for bond repayment.

Additional information on this option:

- This option can be compared with the existing Forest Resource Trust which provides financial assistance to forest landowners desiring to reforest underproductive lands through long-term, below market rate loans.
- Some committee members support a menu of methods be offered to forest landowners.
- The proposed methods would need thresholds for high priority habitat to be set based upon factors including size of stream, stream gradient, type of habitat restored, and length of habitat with restored access.
- For Method 1, the tax credit would sunset in ten years and replacement would then be at the cost of the landowner.
- The riparian specialists that would be added to ODF staff under the Riparian Functions options could help identify needs and implement this option.
- **IMST recommendation #15** calls for culverts and other structures to be modified to permit the passage of juvenile and adult salmonids upstream and downstream at forest road-stream crossings.

Benefits:

This option would provide a funding mechanism to accelerate culvert replacements on family forestlands. Since family forestlands tend to be lower in a basin and are often located along larger and lower gradient systems favored by coho salmon, access to substantial overwintering coho habitat might be restored.

Costs:

Landowners/Operators:	Minor.
State Government:	Potential increase in workload for the Forestry Assistance Program of the Department of Forestry. Funding sources or tax credits could reduce funds available for other state programs.
Local Governments/Communities:	Insignificant.

New funding would be needed and may draw resources away from other higher priority state programs. Ideally, the direct costs to family forest landowners would be minor.

Resources needed:

Possibly legislation, funding sources, and a prioritization system.

Forest Roads Option #6: Systematic Evaluation and Mitigation of Existing Substandard Roads

Objective:

To address existing roads constructed using past practices or methods. Existing roads are to be systematically evaluated and mitigated where appropriate for negative impacts or risks to:

1. Waters of the state (turbidity/sedimentation);
2. Passage of juvenile/adult anadromous fish;
3. Downstream passage of habitat elements (wood and gravel).

Recommendation:

The committee reached consensus on the option objective.

The committee recommends that "other land-use" roads should use at least the same BMPs as required for forestlands.

The committee reviewed seven methods to achieve this objective.

Consensus was reached that the department should create specific road maintenance guidelines for high hazard locations, by developing and making available to operators and regulators improved guidance (Method 5).

Consensus was also reached that the department should be given general authority to require additional cross drainage installation as a maintenance requirement prior to an operation when current road condition and a proposed use will impair water quality (Method 7).

Other methods were considered which received less than consensus support:

With funding available and appropriate criteria in place, eight committee members (BR, PK, PH, GP, SC, BA, RC and DN) would support the creation of financial incentives, such as a tax credit to encourage vacating roads in areas where risk to water quality and aquatic habitat is greatest (Method 4).

Seven members (PK, GP, PH, MS, LH, -- plus RC, SC if voluntary) supported landowners completing road inventory and mitigation work within operation areas, and potentially also along the haul route at the time of harvest (Methods 1 (operations area) and 2 (haul route)). ODF and the operator would review roads within the harvest unit, and apply appropriate mitigation. Those not supporting are methods expressed concerns that they may not focus on sites which are a high priority for improvement. Mitigation would be a function of where an operation happens to be instead of where the greatest risk to natural resources may be.

Seven committee members (PK, GP, MS, LH, PH, -- plus RC, SC only if voluntary) supported landowners developing and implementing a maintenance plan by ownership (Method 3). This would include a systematic road survey to identify and prioritize road maintenance needs, similar to current Oregon Plan Road Hazard and Risk Reduction project. Those not supporting this method state that it is already being implemented through the OFIC Road Hazard and Risk Reduction Project; and that resources used to develop the plan will be diverted from doing on-the-ground work.

Five members of the committee (MS, LH, SC, GP, RC) support the prioritization of road maintenance and repairs, with those roads that exist on high risk sites being given a high priority (Method 6). Two other members did not support making the high risk site designation an automatic trigger for high priority maintenance and repairs.

Additional information on this option:

This proposal includes a suite of improved practices that would be applied to roads needing improvement:

Past Practice	Improved Practices
1. Sidecast construction on steep slopes. 2. "High" fills. 3. Stream crossing culverts sized to pass up to a 25-year storm event. 4. Downstream side of stream crossing fills not armored with rip-rap. 5. Fills not designed to allow for overtopping by high stream flow. 6. Passage of large wood hindered by stream crossings. 7. Passage of gravels hindered by stream crossings. 8. Fish passage through culverts may be problematic for adults and juveniles. 9. Road cross-drain spacing may not meet standard spacing criteria: a. Ditch erosion b. Discharge onto steep slopes c. Ditch water drains directly into streams. 10. Unneeded roads abandoned "as-is".	1. Full-bench design, end-haul construction on steep slopes. 2. "Low" fills. 3. Steam crossing culverts sized to pass up to a 50-year storm event. 4. Downstream side of stream crossing fills armored with rip-rap. 5. Stream crossing fills designed to allow overtopping by streamflow. 6. Facilitate passage of large wood over/through stream crossing fills. 7. Facilitate passage of gravel over/through stream crossing fills. 8. Adult and juvenile fish passage through culverts and maintenance of passage required. 9. Cross- drain spacing is such that ditch erosion is minimized, drain water not directed onto steep slopes, ditch water not directed into streams. 10. Unneeded roads stabilized and vacated.

- Some forest landowners have implemented a voluntary program under the Oregon Plan to inventory roads and mitigate problems, which includes some of the "improved practices" identified in this option. Protocols for this process have been developed and priorities for mitigation have already been established.
- Where necessary ODF would develop and make available guidance to landowners/operators and regulators on methods to achieve the improved practices.
- The technology would need to be developed for several of these improved practices; however, most are being implemented with current knowledge.

- This option includes a number of practices that fall under current forest practice rules. Administration of the current maintenance rules is often reactive, requiring the FPF to identify likely problem areas. For example, the department currently only has the authority to require additional cross drainage installation as a maintenance requirement prior to an operation when current road condition and a proposed use will impair water quality. The intent of this option is to shift efforts to a more proactive stance.
- Some of the proposed methods could potentially be included as components to a stewardship plan (see OAR Chapter 629, Division 606).
- ODF and OSU on occasion offer forest road design, construction and maintenance training (one such session was held in March 2000).
- This option incorporates elements of **IMST recommendation #s 8** (develop and implement standards or guidelines that reduce the length of roadside drainage ditches that discharge into channels); **9** (implement the standards and guidelines for the length of roadside drainage ditch between cross-drainage structures, especially on steep-gradient roads)**, 10** (require the flow capacity of cross-drainage structures and stream-crossing structures and culverts to meet current design standards); **11** (provide for the stabilization of roads not constructed to current standards in critical locations; and **15** (modify culverts and other structures to permit the passage of juvenile and adult salmonids upstream and downstream at forest road-stream crossings).

Benefits: Actively used road systems will more quickly be bought up to current standards where appropriate. Reduced sediment delivery will further limit possible impacts to salmonids and changes in channel form.

Methods 1 and 2: Harvest often creates positive cash flow (some harvests may not create positive cash flow, such as hardwood conversions and salvage operations) which may make funds available for mitigation projects.

Method 3: A more systematic effort can result in more efficient prioritization and mitigation of problem sites.

Method 4: Reduced road mileage in sensitive locations.

Method 5: Landowners would have access to the latest road techniques.

Method 6: A more systematic effort results in more efficient prioritization and mitigation of problem sites.

Method 7: Cross-drain spacing will be improved on roads where proposed use will impair water quality.

Costs:

Landowners/Operators:	Moderate to high costs for some landowners.
State Government:	Increased workload for Forest Practices Foresters. An administrative mechanism would need to be developed for ODF and Department of Revenue to implement Method 4.
Local Governments/Communities:	Insignificant, except as a landowner.

Methods 1 and 2: Will not address those roads where harvest entry is not planned for some time. Timing of mitigation activities may interfere with harvest/haul; some mitigation work limited to in-stream work period. Timber owner may not control haul route(s). Revenue from the harvest may not cover cost of mitigation. Questions remains as to how much money landowners and operators should be asked to spend on mitigation and how to allocate costs when there are multiple road users.

Method 4: May result in greater road length on non-sensitive sites as replacement access. Difficult to gauge the length and location of road length likely to be vacated. Roads traversing mixed ownerships would be problematic.

Method 7: Linking cross drainage installation to an operation may not be an efficient means to address improper spacing. Also, the operator may not control the haul route.

Resources needed:

Rulemaking required.
Statutory change for tax credit option needed.
Administrative actions required.

Depending on the specific method(s) chosen, some sort of tracking system will be needed to identify road segments where inventory and mitigation is needed and has occurred.

Statutory changes would be needed if the intent is to accomplish the objective of this option on other land use roads or on historic roads not currently subject to Forest Practices Act regulation.

Forest Roads Option #7: Cross Drainage Structures on New Roads

Objective:

To minimize the risk of sediment delivery to streams by ensuring that adequate cross-drainage design and construction occurs on new roads.

Recommendation:

The Committee reached a consensus that cross drainage structures on new roads should be installed so that the risk of sediment delivery to waters of the state from new roads is minimized.

The Committee reached a consensus that, while this is the current standard, the department should provide better guidance and training for achievement of the rules (Method 2). Current rules provide authority for installation and maintenance of road cross-drains. Training and improved guidance would be developed and implemented for operators/landowners and regulators that would emphasize the need for adequate spacing and the proper installation of road cross drains.

The Committee reached a consensus that the forest practice rules should be revised to better clarify the objectives for cross-drainage (Method 3). For example, the rules might state that the objectives are to ensure that cross drains are installed in adequate numbers and in proper locations so that:

1. Road surfaces are protected from erosion and retaining water;
2. Erosion of the roadside ditch is minimized;
3. Ditch water is not discharged onto unstable slopes; and
4. The amount of ditch water (and associated sediment) discharging directly into a stream is minimized.

Six (GS, SC, PK, MS, RC, BA) committee members agreed that it is prudent to make changes to existing rules so that they include specific criteria for installation and spacing of cross drainage structures (Method 1). This would include the maximum culvert spacing by road grade, and maximum distance to cross drains above stream crossings. Both cases would include appropriate alternatives for steep fills and high risk sites. Other members stated that it would be difficult to develop universal criteria given the high variability in site conditions. Method 3 also deals with this issue.

Additional information on this option:

- Other existing road issues are included under Forest Roads Option #6. Cross-drains should not be confused with stream crossing culverts. Cross-drains take water from the inboard side of the road and route it under/across the road and discharge the water downslope from the road.
- Recent ODF monitoring studies have found that many existing roads have drainage systems that are not designed to filter sediment. A secondary finding (less commonly associated with sediment delivery to streams) was that steep roads often have inadequate spacing of cross-drainage structures (excessive distance between cross-drains).
- Current rules are objective based, and do not include specific cross-drainage spacing criteria.
- Training and improved guidance could be developed and implemented for operators/landowners and regulators that would emphasize the need for adequate spacing and installation of road cross drains.
- For additional information, see Option 19.
- The number of factors that influence proper cross drainage spacing (including but not limited to: soil properties, slope steepness, road grade, rainfall characteristics and proximity to streams) make it very difficult to put a science-based criteria in rule form.
- Current rules could be modified to help operators install culverts to more efficiently keep sediment out of streams.
- **IMST recommendation #8** calls for the department to develop and implement standards or guidelines that reduce the length of roadside drainage ditches that discharge into channels.
- **IMST recommendation #9** calls for the department to implement the standards and guidelines for the length of roadside drainage ditch between cross-drainage structures, especially on steep-gradient roads.

Benefits:

It is possible to further reduce delivery of sediment to streams through improved cross-drainage practices. These practices will also better protect the landowners' investment in their road system.

Training under Method 2 will help improve application of sound road drainage practices.

Application of Method 3 will reduce sediment delivery from newly constructed roads.

Costs:

Method 1:

Landowners/Operators:	Minor, possibly moderate increase in costs associated with some additional installations of cross-drains. Each new culvert installation costs about $500. Other cross-drains (dips and cross-ditches) may cost less than $50 each. Currently, as part of the *Road Hazard and Risk Reduction* project, many landowners are voluntarily adding additional culverts.
State Government:	Minor, for rule revisions, training and administration.
Local Governments/Communities:	Insignificant, unless these practices are applied to all land uses, where the cost would be significant.

Method 2:

Landowners/Operators:	Insignificant costs associated with employees attending training.
State Government:	Minor costs to develop and administer training, some reallocation of resources away from rule administration.
Local Governments/Communities:	Insignificant costs associated with employees attending training.

Method 3:

Landowners/Operators:	Minor costs associated with some increased use of cross-drainage culverts and other structures, and additional on-the-ground design work to more precisely locate new cross-drains.
State Government:	Minor costs to develop rules and training, and for rule administration.
Local Governments/Communities:	Insignificant, unless required to use these practices on local government managed roads, where costs would be significant.

Resources needed:

Minor reallocation of existing staff resources for training.

Additional resources may be needed to implement rule making.

Forest Roads Option #8: Conditions for Wet Weather Hauling

Objective:

To address roads that are at risk of sediment delivery to streams due to hauling operations conducted during periods of significant precipitation.

Recommendation:

The Committee reached a consensus that the rules should be modified to more specifically address wet-weather hauling. This will include development of two criteria, probably in rule form, to:

1. Address road use in wet weather to ensure that durable surfacing or other effective methods are used on road segments that can deliver sediment to streams; and

2. Require operators to cease heavy truck traffic on roads when the road surface is "breaking down" (only for segments that are delivering sediment to streams). Breaking down would be defined by both depth of ruts and by depth of muddy fine sediment on the road.

Additional information on this option:

- During periods of significant precipitation, road surfaces that are not constructed with adequate surface materials and spacing of drainage structures are a potential source of fine sediment delivery by allowing sediment laden waters to enter stream channels directly.
- Hauling operations conducted on roads with poor drainage can further increase the risk of sediment delivery.
- One area not directly addressed by the rules is sediment problems related to road use. Increased turbidity can be associated with the use of roads during rainy or thawing periods. Currently within the guidance for the road maintenance rules, operators are directed to stop hauling when FPFs observe high levels of turbidity entering streams. However, there are currently no rules that address the specific level of turbidity that is considered acceptable during wet season hauling.
- The committee stated that BMPs for road use should be extended to other land uses.
- **IMST recommendation #12** calls for the forest practice rules to be changed to require durable surfacing on wet-season haul roads and that operators be required to cease hauling before surfaces become soft or "pump" sediment to the surface.

Benefits:

There is the potential to further reduce delivery of sediment to streams through improved road-surface management practices. These practices will also better protect the landowners' investment in their road system.

Costs:

Landowners/Operators:	Moderate to significant increase in costs associated with expense of additional surfacing, and in some cases temporary loss of ability to haul timber. The cost of additional surfacing is expected to vary from $100.00 to $2500.00 per each stream crossing, depending on the region and length of road that drains to that crossing. The value of temporary loss of road use is very difficult to quantify. The number of crossings affected depends on the planned wet season uses of roads.
State Government:	Moderate, for rule revisions, training and administration of new rules.
Local Governments/Communities:	Insignificant, unless they are required to use similar practices as forest landowners. In that case, costs would be significant.

Resources needed:

Requires rulemaking.

Forest Roads Option #10: Developing Decision Criteria for Evaluating Proposed Road Construction or Reconstruction in Sensitive Sites.

Objective:

To reduce the potential of sediment delivery or other undesirable effects to streams from new roads located where there is a high risk of landslides, surface erosion, or of direct physical alteration to streams, riparian areas, lakes or wetlands.

Recommendation:

The committee reached a consensus that the department should develop clear decision-making criteria for evaluating proposed road locations in areas where there is a high risk of landslides, surface erosion, or of direct physical alteration to streams, riparian areas, lakes or wetlands. The criteria should identify preferred locations and construction practices that will result in roads being constructed in a manner that results in the lowest overall impact to water quality and fish habitat while allowing the landowners to achieve their management objectives (Method 5). The criteria should also direct the Department of Forestry to not approve road construction or reconstruction in the sensitive areas described above, if viable alternatives exist.

Five committee members (GP, PK, SC, PH, MS) support that, in areas where roads constructed using current BMPs are likely to degrade water quality, the department create additional restrictions on the locations of new roads in riparian management areas, high risk sites, unstable slopes, flood plains, wetlands, and side channels (Method 3). Other members did not support this method and requested clarification on what "likely to degrade water quality" means. They believe that new roads constructed under current best management practices, combined with the consensus agreements to increase the requirements for cross drainage, stream crossings, wet weather hauling, etc., are very unlikely to degrade water quality.

Four committee members (GP, PK, MS, LH) recommend the forest practice rules be modified to prohibit construction of roads on high risk sites (Method 4). Other members opposed this method.

Four committee members (GP, PK, SC, MS) recommend the forest practice rules be modified to ensure roads constructed across high risk sites are constructed with no fill and also with 'fail-safe' drainage systems (Method 1). Other members pointed out this outcome is already required, where feasible.

Three committee members (GP, PK, SC) recommend the forest practice rules be modified to require that written plans for road construction and timber harvesting operations on landslide prone locations be prepared by a geoscience professional (Method 2). Other members opposed this method due to the added cost to landowners and because the need for geoscience professional involvement could not be justified in every situation. They also pointed out that the geoscience professional may not always have forest road construction or harvesting experience.

Additional information on this option:

- Roads that are built on some steep slopes above streams or that directly fill or excavate in streams, floodplains, lakes or wetlands can have much greater impacts on water quality and aquatic resources than roads elsewhere across the landscape. If these roads are constructed, action should be taken to minimize or eliminate the risks they pose to aquatic resources to the maximum extent practicable.
- More discussion is needed on the appropriate definition of a "high risk site".
- Current rules require that operators shall "avoid locating roads on steep slopes, slide areas, high risk sites, and in wetlands, riparian management areas, channels or floodplains where viable alternatives exist." Prior approval of the State Forester is required before roads can be constructed or reconstructed in such locations.
- There are cases where roads should not be constructed. The current rule language allows ODF to require written plans and to not approve construction or reconstruction when the risk of such action is too great. However, the application of the current rule language requires a conservative interpretation to ensure that the desired level of resource protection is consistently achieved.
- It is not clear to some on the committee what the basis for decision-making is under current rules. However, the field site visited by committee members in eastern Oregon where ODF did not approve proposed road reconstruction represents the type of decision-making supported by the committee members to present on the tour.
- It was determined that Methods 1 to 4 could be implemented under current rules, but the department lacked a decision-making criteria to evaluate these and other possible methods. Therefore, the committee developed and endorsed Method 5, which could incorporate Methods 1 through 4 into a menu of administrative options.
- The committee expressed consensus support for ODF's current conservative interpretation of existing rules, as demonstrated on the Eastern Oregon tour.
- Some committee members believe the current system under the forest practice rules is working and that it is not possible to develop clear and specific criteria for variable field situations that defy standard solutions. Any option chosen should not reduce the incentive for FPFs to seek "win-win" solutions with operators. Also, the concept of "sensitive areas" is not well defined. They believe the risk to resources is primarily from older roads, not new construction, and that topic is covered by other options.
- **IMST Recommendation #7** calls for the forest practice rules to be changed to eliminate language that equivocates on resource protection in favor or forest operations. **Recommendation #14** calls for continued application of best management practices on high risk slopes.

Benefits:

This option will reduce the risk of major impacts to streams and water quality. This proposal is likely to result in the "removal" over time of high impact (especially draw bottom) roads that might otherwise be proposed for reconstruction where alternatives exist.

Costs:

Landowners/Operators:	Significant, potentially high for some landowners, as compared to current practices. Road construction and timber harvesting costs will be increased in some steep slope areas. Compared to Methods 1 through 4, Method 5 may provide more flexibility to address site-specific situations, perhaps resulting in lower cost solutions. Long-term costs may be reduced by vacating creek bottom roads that require "reconstruction" to maintain their use. Based on past experience, these situations will be relatively uncommon. Costs could be reduced and progress enhanced by providing some grants to assist in vacating some roads. Costs could be reduced by developing equitable procedures for the use of roads on other ownerships, particularly federal lands (See Option #16).
State Government:	Insignificant.
Local Governments/Communities:	Insignificant, except as a landowner.

Resources needed:

Administrative resources are needed. Rulemaking may be needed to formalize decision-making criteria.

The resources needed depend upon how the criteria will be applied in approving or disapproving roads. The focus of the rules will be to require that "roads are located or reconstructed in the location with the lowest overall impact to water quality and fish habitat while meeting land management objectives. These criteria will most likely require additional oversight and review by ODF, and/or professional design by the landowner. While these situations are relatively uncommon, they can require substantial ODF and landowner resources on a case-by-case basis.

Forest Roads Option #12: Stream Crossings that Pass Large Wood and Gravel

Objective:

To provide or develop means for the movement of large wood and sediment downstream at those crossings which may otherwise restrict movement. The transport mechanisms for large wood and sediments may be either stream storm flows or channelized debris flows.

Recommendation:

Twelve of the committee members (RC, BR, DN, PK, MS, GS, BA, TH, PH, GP, LH, WS) supported this objective.

A committee member not supporting this objective expressed concern for downstream impacts of large wood and sediment on public and private property and infrastructure.

Additional information on this option:

- This option proposes to develop a broader range of engineering designs for stream crossing structures that will improve passage of large wood and sediment, both during high flows and for debris flow prone channels.
- Increased use of fords may improve passage of large wood and sediment compared to culverts and bridges.
- A program to move sediment and large wood from the upstream sides of crossings to the downstream sides using machinery might be beneficial. This could be done as a part of routine road maintenance on culverts and bridges as an alternative to removing the material from the stream system.
- This option relates to a topic also referenced by **IMST recommendation #19** which requests the Oregon Forest Research Laboratory, in collaboration with ODFW, to develop forest road-stream crossing strategies that facilitate the passage of large wood at road-stream crossings.

Benefits:

Crossings designed to allow for large wood and sediment passage, as well as machine assisted movement of material would reduce the influence of roads and road fills on the delivery of sediment and large wood to fish-bearing streams, helping restore the natural disturbance regime that has maintained salmonid habitat in the past.

Costs:

Landowners/Operators:	Moderate to high, depending upon the nature of the structure, or amount of wood and sediment which may require removal.
State Government:	Potentially significant increase in workload for forest practices foresters.
Local Governments/Communities:	Low. Potential increase in large wood reaching developed areas downstream.

The practices needed to achieve this objective are largely undeveloped and untested.

Resources needed:

Rulemaking required.

Administrative actions required.

ODF, other agencies, and landowner representatives will need to collaborate on stream crossing designs and other techniques appropriate for passage of large wood and sediment. Technical, administrative and legal barriers should be discussed and removed if they are interfering with the achievement of this objective.

Forest Roads Option #16: Develop Policies and Incentives for Cooperative Forest Road System Planning

Objective:

To encourage cooperative forest road system planning, design and use between different landowners in order to minimize the duplication and construction of unnecessary forest roads.

Recommendation:

The committee reached a consensus that improved cooperative road system planning and use is especially needed between federal and private forest landowners.

Seven of the 13 committee members (PH, GP, MS, PK, LH, BA, RC) recommend that the Board of Forestry and ODF should develop more proactive policies and incentives to encourage cooperative forest road system planning, design and use between different landowners in order to minimize the duplication and construction of unnecessary forest roads.

Stronger consensus was not reached because some committee members believed the recommendation was unnecessary, it would be difficult to compel private landowners to cooperate, or because they believed the recommendation should be solely focused on federal road use issues. The committee did not agree on a regulatory approach to cooperative road planning and use. More study is needed to clarify any legal obstacles that could limit a regulatory approach.

Additional information on this option:

- Forestland in Oregon is often in a checkerboard or fragmented pattern of mixed ownership. There are situations where a landowner may have the opportunity to access his/her property using another landowner's road system and thereby reduce the length of new road that must be built for an operation.
- Currently a number of disincentives exist, especially for federal lands, which prevent private landowners from using road systems on another ownership. Sometimes this results in the duplication of road systems and parallel roads being built on opposite sides of property lines. When these duplicate roads are built in high risk areas, it can increase the risk of sediment delivery and other adverse effects to streams.
- The recommendation of a majority of committee members is to request the Board of Forestry and ODF to be more proactive in their efforts to minimize the construction of unnecessary forest roads that are built due to existing disincentives for cooperative road system planning, design and use.

- Specific approaches that should be considered include, but are not limited to:
    1. Working through administrative and Congressional channels to remove federal disincentives to cooperative federal/private road planning and use;
    2. Encouraging the evaluation of existing road systems on the landscape during watershed assessments, with attention focused on opportunities to reduce or prevent duplicative roads;
    3. Prior to the construction of new roads, alerting landowners to opportunities to use existing multi-landowners road systems that are more efficient and protective of forest resources; and
    4. Recognizing and highlighting examples of successful cooperative road planning and use.
- Incentives will likely be needed to improve private cooperative road system planning and use. Many landowners have already established such agreements. However, development of new agreements with the federal agencies appears to be problematic. It appears that the current system rewards federal agencies for not cooperating with private landowners.
- In other cases, neighboring private landowners (sometimes but not always those who are using their lands for other purposes) may set unreasonable conditions on road use. Costs may be so inflated that it is far less costly for the affected landowner to construct a new road, even when new road construction is expensive (over $100,000.00 per mile of road).
- **IMST recommendation #2** calls for ODF to develop a policy framework to encompass landscape (large watershed) level planning and operations on forests within the range of wild salmonids in Oregon.

Benefits:

There is the potential to reduce the length of new roads built and decrease the risk of sediment delivery to streams where this recommendation prevents unnecessary roads from being built in high risk areas. Landowners will also reduce operational costs if they do not have to build and maintain additional unnecessary roads.

Costs:

Landowners/Operators:	Insignificant costs associated with cooperative planning that is already occurring. The cost of additional incentives is unknown.
State Government:	Insignificant costs associated with cooperative planning that is already occurring. The cost of additional incentives is unknown.
Local Governments/Communities:	Insignificant costs associated with cooperative planning that is already occurring. The cost of additional incentives is unknown.

Private property rights are likely to be a barrier to compelling some landowners to make their roads available to others through regulation. State government has limited influence on federal policies that act as a disincentive to cooperative road system planning, design and use between federal and private land managers.

Resources needed:

At this time, no additional resources have been identified as being needed to implement this recommendation.

Forest Roads Option #18: Road BMP Compliance and Effectiveness Monitoring

Objective:

Evaluate the need for further road compliance and effectiveness monitoring, and implement monitoring as necessary.

Recommendation:

The committee reached a consensus that future forest road best management practice compliance and effectiveness monitoring should be implemented within the context of the Forest Practices Program's strategic monitoring plan and prioritized in context with available monitoring resources and other monitoring needs.

Additional information on this option:

- Road monitoring activities that have been completed include: landslides (in Robison and others, 1999) and road surface drainage (ODF 1996). Currently, ODF has no monitoring information on turbidity associated with winter hauling, or on-the-ground verification of voluntary road hazard and risk reduction project repairs. The need for monitoring under the road hazard and risk reduction project is included in the Oregon Plan for Salmon and Watersheds. However, there are currently no specific plans or funding to implement this monitoring. The fact that the advisory committee is being asked to develop policy recommendations on these topics without monitoring data in hand demonstrates a disconnect that currently exists between policy processes and monitoring processes.
- Currently, as part of the Best Management Practices (BMP) Compliance Audit Project, ODF is monitoring compliance with the road construction and maintenance rules along with a large number of other harvesting and water protection rules. This project is a two-year effort to provide a systematic, random "audit" of forest practice rule compliance.
- ODF will assess the need to continue and expand on this project based on the study results, and through a review process that involves key stakeholders. The BMP pilot study has already identified a need to more specifically monitor BMP effectiveness during rainy-season hauling. The current project is not gathering information on sediment associated with wet weather use of roads.
- Currently available information indicates that roads are the single greatest chronic source of fine sediment delivery to stream systems associated with forest practices. However, currently available information also confirms that when properly implemented, forestry BMPs are effective at reducing delivery of sediment to the waters of the state.
- Instream measures of water quality are an integration of everything upslope. Consequently, instream measurements can be a diluted or exaggerated version of what is occurring higher up in the channel network or on adjacent slopes. It is usually easier to accurately identify a road drainage-related sediment source and to quantify the volume of sediment it produced

than it is to measure sediment in the stream and work backwards to the source. In this context, road-related water quality protection compliance monitoring may reveal more useful information than water quality protection effectiveness monitoring.

Benefits:

The BMP Compliance Audit Project will provide ODF with the most current information on compliance and effectiveness of the construction and maintenance rules over time. The results of this project will be used to determine if an expanded, or perhaps a more focused, compliance and effectiveness monitoring of forest road BMPs is needed and whether such work should be a high priority in future monitoring strategic plans.

Costs:

Landowners/Operators:	Insignificant, limited to a potential increase in harvest taxes to fund expanded monitoring.
State Government:	Significant, if monitoring program is further expanded.
Local Governments/Communities:	Insignificant.

Any further increased emphasis on, and ODF commitment to, long-term road rule compliance and effectiveness monitoring will use limited program resources that could address other high priority monitoring objectives. These objectives change over time in response to new policy processes.

Resources Needed:

Administrative actions and long-term budgetary commitment required.

Additional resources would be needed for ODF to prioritize and maintain a long-term monitoring effort devoted specifically to road issues. However, should the monitoring effort be considered within the current monitoring strategy and prioritized accordingly, no additional resources would be needed.

Forest Roads Option #19: Road Construction and Maintenance Education

Objective:

Provide continuing education for landowners and operators specific to the road construction and maintenance rules.

Recommendation:

The Committee reached a consensus that additional training on forest road construction and maintenance should be provided for landowners and operators.

Additional information on this option:

- ODF and OSU organized a "Road Stewardship Workshop" held on March 7 and 8 of this year.
- A *Forest Road Management Guidebook* has just been completed. This guidebook will help landowners determine what repairs are needed on older roads.
- Engineers working for private forest landowners and ODF have collaboratively provided several training sessions for operators over the last two years
- Many ODF districts have provided road maintenance training for operators over the last two years.

Benefits:

Training is an essential element of a BMP program. Operators cannot effectively protect streams and fish habitat without the appropriate knowledge, skills and abilities.

Costs:

Landowners/Operators:	Minor costs associated with employees helping develop and attend training.
State Government:	Minor costs to develop and administer training, some reallocation of resources away from rule administration.
Local Government:	Insignificant costs associated with employees attending training.

Resources needed:

Funds and personnel needed to develop and implement training.

Forest Roads Option #57: Steep Slope Ground Skidding

Objective:

To reduce the potential of sediment delivery or other undesirable effects to streams from skid roads constructed on steep slopes.

Recommendation:

The Committee reached a consensus that the forest practice rules should be changed to require prior approval for ground based harvesting on steep slopes where there is a significant risk of sediment delivery to streams.

Additional information on this option:

- Skid roads or trails are used by tracked or wheeled skidding machines to move logs from the stump to the landing. They can be constructed and used at much steeper grades than roads used for trucks.
- A prior approval requirement for ground skidding in high erosion hazard locations could reduce the risk of sediment delivery to waters of the state. It will also help operators to better plan operations in these locations, and to modify operations where risk of sediment delivery is greatest. In some cases, planning activity may reduce operational costs.
- In very limited cases, operators will need to use cable yarding instead of ground based harvesting systems.
- A technical process is needed to develop specific criteria.

Benefits:

This option will reduce the risk of sediment delivery to waters of the state. It will also help operators to better plan operations in these locations, and to modify operations where risk of sediment delivery is greatest. In some cases, planning activity may reduce operational costs.

Costs:

Landowners/Operators:	Minor in Northwest Oregon, to moderate in parts of Southwest Oregon and Northeastern Oregon (where ground skidding on steep slopes is not uncommon) In limited cases, the additional planning could reduce operating cost, but in other cases the cost of changing from a ground based to a cable yarding system could be as much as a $50.00 per thousand board foot cost.
State Government:	Minor, for rule revisions, training and administration.

Local Governments/Communities:	Insignificant, although there may be isolated cases where these changes cause a landowner to delay timber harvesting.

Resources needed:

Rulemaking is required.

Forest Roads Option #59: Voluntary Road Closure Program

Objective:

To create a road closure program that forest landowners, the Department of Forestry, and local law enforcement would use to limit vehicle access onto sensitive road systems that have a high risk of delivering sediment to streams, or that can directly impact aquatic habitat.

Recommendation:

The committee reached a consensus that a road closure program should be developed that forest landowners, the Department of Forestry, and local law enforcement can use to limit public access onto sensitive road systems that have a high risk of delivering sediment to streams, or that can directly impact aquatic habitat.

Additional information on this option:

- Legacy roads, roads built on steep slopes and unstable soils, or unsurfaced roads that have the potential to deliver sediment to streams should be closed to public vehicle traffic during the rainy months.
- Currently, ORS 164.270 allows a landowner to close roads to motor-propelled vehicles. This statute is under the criminal trespass laws and it is not clear what the attached penalty is, but enforcement requires a complaint by the landowner through the local district attorney. Enforcement is difficult under the trespass laws.
- Under the proposed approach, landowners would close roads to vehicles for the purposes of protecting water quality.
- Identifying candidate roads could be done with ODF and ODFW input. Road closure signs would be posted to indicate what type of public access is allowed (e.g. foot traffic but no motorized vehicles). User groups, such as motorcycle or off-road clubs, would be informed.
- Agreements for enforcement with local sheriffs or state police would be needed and trespass citations and procedures would need to be clarified. It is envisioned that it would be a misdemeanor offense, subject to uniform citation and civil penalty, to violate a road closure, enforceable by local sheriffs, the state police, or possibly ODF.
- Assessed civil penalties would be deposited to the "Forest Incentive Fund" (also see Forest Roads Option #58). This fund could provide money for gates and posters, plus repairs caused by persons trespassing on closed roads.
- There may be a linkage between this option and Option #16: Cooperative Forest Road System Planning.
- Emphasis is also needed for public outreach and education on the importance of "treading lightly" when recreating on forestlands.
- This option has the potential to greatly reduce public recreation access during the rainy season. Compounded by increasing closures to vehicles on federal lands, this option could particularly restrict big game hunting is some areas and concentrate it elsewhere.

- The committee requested further clarification and development of this option.
- Oregon recently began offering "Oregon Ag" license plates. The plates were designed by the Oregon Agricultural Education Foundation which sponsors and supports community agriculture, forestry, and natural resource education and research projects. The plates cost ten dollars more than regular plates, with a portion of the proceeds supporting the foundation's work. Several committee members supported the development of a similar program specific to forestry, with proceeds going to the "Forest Incentive Fund."
- This option indirectly addresses **IMST recommendation #12** which, in part, calls for operators to be required to cease hauling before surfaces become soft or "pump" sediment to the surface.

Benefits:

This option would reduce the impact of unauthorized vehicle damage done to roads. Such damage can result in significant sediment delivery to streams. Road maintenance costs for landowners may also be reduced if this option is implemented.

Costs:

Landowners/Operators:	Insignificant.
State Government:	Potential administration and enforcement costs to state agencies. There would be a cost of establishing the road closure program and allocating the incentive funds to repair damage.
Local Governments/Communities:	Insignificant.

Resources Needed:

Agency administrative support. Potential rule or statute changes to set up road closure program and Forest Incentive Fund. Enforcement actions require resources. Moving this issue out from "trespass law" to a uniform citation with civil penalty would make enforcement much easier. If ODF was to enforce this option additional resources might be needed particularly in the civil penalty section.

Landslides Option #45: Identifying High Risk Sites

Objective:

To ensure that all landslide prone locations (now called "high risk sites") are identified prior to timber harvest operations.

Recommendation:

The committee reached consensus on the objective.

The committee also reached consensus that a combination of Methods 1 and 2 should be used to achieve the objective. During the notification process, the department should inform the operator of the likely presence of high risk sites in the operation area, based on coarse screen maps (Method 1) . The operator would then be expected to more specifically locate sites within the operation area by field reconnaissance (Method 2). There is also the expectation that "large" areas of high risk sites which happen to not be in the mapped areas will also be identified by the operator.

Five committee members (PK, GL, RC, SC, MS) supported a proposed method that would require identification of high risk sites by a geoscientist employed by the operator. (Method 3) Four members expressed opposition to this method, citing the high cost of hiring a consultant and pointing out the IMST report supports current approaches.

Additional information on this option:

- The current rules require that Forest Practices Foresters inform the operator of the presence of high risk sites (HRS).
- Agreement will be needed on the technical basin for the creation of the coarse screen maps under Method 1.
- This option is intended to create additional tools to ensure that HRS are identified prior to operations. The committee's intent is to focus this option on timber harvest operations. The forest practice rules already address road locations involving high risk sites.
- HRS identification will be a function of operator competency and diligence in locating such sites. By way of analogy, ODF already expects operators to properly notify about the presence or absence of Type F streams and apply appropriate practices, regardless of whether ODF has identified the stream as fish bearing or not.
- IMST Recommendation #13 (tree retention on high risk slopes) and Recommendation #14 (continue to apply BMPs on landslide prone slopes) are recommendations which apply to high risk sites. They do not specifically address site identification; however, proper site identification is implicit for the recommendations to be effective.

Benefits:

Combined Methods 1 and 2 provide a simple, fairly conservative screen for HRS.

Method 3 may provide a more thorough identification of high hazard locations and risk characterization and may result in a more targeted application of harvesting practices commensurate with the downslope risk to resources.

Costs:

Landowners/Operators:	Moderate for combined Methods 1 and 2. Method 3 would typically cost landowners or operators about $500 to $1500/ harvest unit for a geoscientist field reconnaissance and report. Costs could be higher depending on the complexity of the site.
State Government:	Moderate for combined Methods 1, 2, and Method 3.
Local Governments/Communities:	Insignificant; however, identification of high risk sites will require local governments to take actions to prevent future downslope development.

Resources needed:

Rulemaking will be needed to clarify agency and landowner/operator responsibilities and HRS identification criteria. ODF will be required to create and maintain a high risk map or database, notify operators based on screening for high risk sites, review reports on high risk sites, whether done by foresters or geoscientists, and monitor compliance and results.

Landslides Option #46: Identifying Debris Flow Risk for Streams

Objective:

Identify stream channels which are prone to debris flows and torrents. Identifying those channels which are capable of transporting large wood to Type F streams could make it possible to focus riparian prescriptions on those streams where greater benefit to aquatic habitats are likely.

Recommendation:

Consensus was reached that the department should identify stream channels which are prone to debris flows and torrents. Identifying those channels which are capable of transporting large wood to Type F streams could make it possible to focus riparian prescriptions on those streams where greater benefit to aquatic habitats are likely.

The committee reached consensus that the department should inform the operator during the notification process of the likely presence of debris flow prone channels, based on coarse screen maps. The operator would then be expected to more specifically locate debris flow prone channels by field reconnaissance. ODF would provide specific criteria to be used in field identification (Method 1).

Six committee members (PK, SC, LH, GP, MS, RC) recommended that debris flow prone channels be identified by a geoscientist employed by the operator (Method 3). Those opposed cited the high cost of hiring a consultant.

Five committee members (PK, SC, LH, GP, MS) supported the operator identifying the presence of debris flow prone channels using criteria in rule form (Method 2). The operator would notify the department of the presence of such channels during the notification process, using the identification criteria as stated in rule form. Method 2 differs from Method 1 in that ODF would not provide information to the operator based on coarse screen maps. Several other members would apparently support this method if further clarifications/qualifications were made part of the option and method. One member again questioned the need for identifying debris flow prone channels.

Committee recommendations on Riparian Functions options may also relate to this option.

Additional information on this option:

- Currently, the rules do not explicitly require identification or treatment of debris flow prone channels (DFPC) for the purposes of providing large wood to Type F streams.
- This option is directly related to components of the Subcommittee Riparian Option.

- **IMST Recommendation 13** calls for the retention of trees in likely debris torrent tracks to increase the likelihood of large wood transport to streams from debris torrents. Inherent in this recommendation is the need to identify potential debris torrent track channels.

Benefits:

Method 1 provides a simple, fairly conservative screen for DFPC.

Since the operator is entirely responsible for DFPC identification under Method 2, this method lessens the "up-front" agency workload.

Of all three methods, Method 3 may provide the most thorough identification of DFPCs.

Costs:

Landowners/Operators:	Moderate for Methods 1 and 3. Method 3 would typically cost landowners or operators about $500 to $1500/ harvest unit for a geoscientist field reconnaissance and report. Costs could be much higher depending on the complexity of the site.
State Government:	Moderate for Methods 1, 2, and Method 3.
Local Governments/Communities:	Insignificant; however, identification of debris flow prone channel sites will require local governments to take actions to prevent future downslope development.

DFPC identification will be a function of operator competency and diligence in locating such sites. By way of analogy, ODF currently expects operators to properly notify about the presence or absence of Type F streams and apply appropriate practices, regardless of whether ODF has identified the stream as fish bearing or not.

Resources needed:

Rulemaking to clarify responsibilities and DFPC identification criteria.

Landslides Option #47: Management of High-Risk Sites

Objective:

To minimize adverse impacts on soil and water resources that result from management practices on high risk sites.

Recommendation:

Consensus was not reached on the objective wording but the committee did reach a consensus that locations most prone to landslides (now called "high risk sites") should be managed with techniques that minimize impacts to soil and water resources.

The committee also reached consensus that to achieve this objective the best management practices that are currently used in guidance to protect high risk sites should be incorporated into the forest practice rules (Method 1) and a better case history basis for evaluating the effectiveness of those practices should be developed (Method 6). These standard practices are designed to minimize ground alteration/disturbance on high risk sites from logging practices. The IMST recommendation suggests additional case history evaluation of practices used on high risk sites, but it is unclear how such a case study approach would be developed.

Five committee members (GP, LH, PK, MS, SC) agreed that it is prudent to base practices on a written plan prepared by a geoscience professional (Method 2). The other members felt that the cost for this method was greater than the benefit, especially since most geoscientists have a limited understanding of specific forest practices.

The same five committee members supported leaving trees on high risk sites that may influence slope stability (Method 3).

Limiting the percent of high risk sites in young age classes on a watershed level, by ownership, (Method 4) was also supported by five committee members.

Method 5, a harvest prohibition on some or all high risk sites, was ~~only~~ supported by four members. The members that did not support Methods 3, 4 and 5 expressed concern about the high potential cost of these measures, given that the effect of timber harvesting on landslides may be primarily limited to changing the timing of landslide occurrence.

Committee recommendations on Riparian Functions options may also relate to this option.

Additional information on this option:

- Current rules require specific harvesting practices be employed on high risk sites. These practices are designed primarily to limit ground disturbance so that the landslide risk will not be increased.

- The rules and/or guidance do not require merchantable trees to be left on the site to possibly play a role in stabilizing the slope either through mechanical (root reinforcement) or hydrological (water routing) mechanisms.
- Timber harvesting can affect landslide occurrence in areas with high landslide risk. Higher landslide densities and erosion volumes were found in stands that had been harvested in the previous nine years, as compared to forests older than one hundred years, in three out of four ODF storm monitoring study areas. Forested areas between the ages of 10 and 100 years typically had lower landslide densities and erosion volumes than found in the mature forest stands.
- In the locations adjacent to landslides surveyed in the ODF storm monitoring study, landowners and loggers complied with the forest practice harvesting rules (as changed in 1983) to minimize ground disturbance and slash accumulations on landslide prone sites.
- Any disturbance that removes vegetation on steep, landslide prone locations may result in a temporary increase in landslide occurrence. Both the length of time these locations experience periods of reduced forest cover and the extent of lands with reduced vegetative cover can affect landslide density and erosion rate.
- Some evidence indicates small areas tree retention on high risk sites may increase landslide occurrence.
- **IMST Recommendation #13** (tree retention on high risk slopes) and **Recommendation #14** (continue to apply best management practices on landslide prone slopes) are recommendations which apply to the management of high risk sites.

Benefits:

Combined Methods 1 and 6 provide some additional assurance that harvesting methods will reduce ground disturbance on high risk sites, and that an attempt will be made to develop more case study information on the effectiveness of different practices.

Method 2 will improve the assessment of potential debris flow initiation and characteristics, and the resources that could be affected by landslides from high risk sites.

Managing the quality of high-risk sites (i.e., the amount of large wood left on the site) will potentially increase the amount of large wood delivered to streams (Method 3); however, Option 46 is more likely to affect wood delivery to channels than this option.

Method 4 will control the portion of high risk site in vegetative conditions with higher rates of landslide occurrence in watersheds and may result in lower long-term costs than a strict prohibition of operations on high risk sites.

Method 5 might prevent some or most of the temporary increase in landslide occurrence in most landslide surveys.

Costs:

Combined Methods 1 and 6:

Landowners/Operators:	Little change from current practice.
State Government:	Moderate cost of developing and implementing the necessary case studies.
Local Governments/Communities:	Insignificant.

Method 2:

Landowners/Operators:	Method 2 would typically cost landowners or operators about $500 to $1500/ harvest unit for a geoscientist field reconnaissance and report. Costs could be much higher depending on the complexity of the site. There would also be the increased cost associated with leaving additional trees, since geotechnical reports are typically conservative.
State Government:	Possible reduction in harvest and income tax revenues.
Local Governments/Communities:	Possible reduction in harvest and income tax revenues.

Methods 3 and 5:

Landowners/Operators:	Significant to very major increased costs associated with leaving large areas volumes of timber (especially under method 5) unharvested, possibly in perpetuity. Potential increase in landslide occurrence from windthrow.
State Government:	Possible reduction in harvest and income tax revenues.
Local Governments/Communities:	Possible reduction in harvest and income tax revenues.

Method 4:

Landowners/Operators:	Moderate to significant increased costs associated with delays in harvesting timber, depending on land ownership.
State Government:	Moderate costs associated with increased administration for complex regulations. Possible reduction in harvest and income tax revenues.
Local Governments/Communities:	Possible reduction in harvest and income tax revenues.

Resources needed:

A quantitative cost assessment to identify acreage and timber values impacted by this option is needed.

Rulemaking will be needed to describe current practices in rule form.

Additional resources may be needed for administration of practices.

Rulemaking and potential statute changes to implement Methods 2 through 5.

Landslide Option #61: Large Wood Sources From Hillslope Areas and Debris Flow Channels.

Objective:

To supply large wood inputs from debris flow prone channels and hillslope areas that have the potential to deliver large wood to fish-bearing streams of a quality and quantity sufficient to provide important habitat functions in those streams.

Recommendation:

All committee members except one (TH) agreed that it is important to leave trees or downed wood in locations where they provide wood to be moved by debris flows into fish-bearing streams. There was concern expressed by several committee members about the potential high cost of this option.

To achieve this objective, all committee members but one (TH) agreed that is was appropriate to use a menu of potential methods to leave trees or downed wood, depending upon likelihood of wood delivery and operational efficiency (Method 5). The committee felt that is was not appropriate to rely on a single strategy to provide this potential source of large wood. The operator would be required to select an appropriate option in cooperation with ODF.

Five members (GS, BA, SC, GP and MS) supported the placement of additional "down large wood" on sites or channels with the likelihood to deliver the wood to Type F streams (Method 6).

Four committee members (MS, LH, GP AND PK) supported leaving trees on high risk sites likely to deliver wood to Type F streams (Method 1).

Four committee members (PK, MS, GP and LH) supported leaving additional trees in headwall and upslope areas (Method 3).

The same four members supported using a riparian management area for small, Type N debris flow prone channels (Method 4). Note: "Strong agreement" was reached for a similar method as part of the riparian proposal.

Two committee members (MS and GP) supported locating in-unit leave trees (some or all of the current two per acre) in hillslope and headwall areas (Method 2).

Additional information on this option:

- There is increasing scientific evidence that wood contained in debris flows is an important source of large wood for downstream fish habitat. These areas include likely debris flow paths, which are typically steep hillslopes below high risk (hazard) sites, and above steep stream channels (a portion of small Type N streams). While these areas are providing some

level of functional large wood inputs under the current rules, the rules were not specifically designed to provide sources of large wood from these areas.

- Debris torrents that traveled further than expected in the ODF study were on average larger and had younger riparian vegetation near their terminus. Thus in terms of determining landslide run-out distance, channel junction angles and channel gradient are the primary factors, while landslide volume and composition of the riparian area along debris torrent-prone channels may be important secondary factors.
- This option is directly related to components of the Subcommittee Riparian Option and there is the opportunity to explore Option #61 as an element of that option.
- **IMST Recommendation 13** calls for the retention of trees on "high risk slopes" and in likely debris torrent tracks to increase the likelihood that large wood will be transported to streams when landslides and debris torrents occur.

Benefits:

Methods 2 and 3 could result in some increased wood delivery to channel, but will also result in fewer trees in other locations on the landscape.

In most cases, Method 4 is believed to be the most efficient means of providing wood for debris flows.

Method 5 provides the greatest landowner flexibility and may result in better site-specific prescriptions.

Method 6 may be the lowest cost method for landowners and may be most efficient where wood loadings are low or where tree retention is unworkable.

Costs:

Given the lack of specifics under Option 61, it is very difficult to evaluate costs. Therefore, this discussion is limited in accuracy.

Trees in some locations (especially certain actively moving landslides) have a fairly high potential to be moved into stream channels. However, most high risk sites fail very infrequently, so leaving trees on the actual high risk site (Methods 1, 2, and 3) may be a very inefficient means for ensuring hillslope delivery of large wood.

Landowners/Operators:	It is likely that Method 2 will result in little or no increased cost to landowners. Methods 1, 3, 4, 5, and 6 will increase landowner costs. The significance of this increase depends on the number of additional trees or logs that are left on site, and could very well be significant.
State Government:	Reduced harvest tax revenues could result, depending on the number of trees left on site. Also,

	increased costs for administration of practices, depending on the complexity of these practices.
Local Governments/Communities:	Reduced harvest tax revenues depending on the number of trees left on site.

Resources needed:

A quantitative cost assessment to identify acreage and timber values impacted by this option is needed. Rulemaking may be needed. Possibly additional agency resources needed to administer more complex regulations.

Riparian Functions Option #20: Active Placement of Large Wood

Objective:

To provide additional large wood large wood to streams by actively placing the wood in areas where it will provide the greatest benefits to salmonids, while assuring the timely achievement and maintenance of characteristics of mature forest conditions.

Recommendation:

The committee reached a consensus that the active placement of large wood in streams is necessary for short-term aquatic habitat improvement, but it should be done in a manner that still assures the timely achievement and maintenance of characteristics of mature forest conditions in the longer term. The committee also agreed that a menu of methods should be developed to prioritize and guide large wood placement activities. This menu should include placing wood along streams during an adjacent entry for harvesting as one method.

The committee could not agree on whether the current system of basal area credits for active large wood placement should be continued. Some members (LH, PK, MS, GP) are concerned about any short-term reduction in riparian function as a trade-off for active large wood placement. Other committee members believe landowners will be less likely to initiate active large wood placement projects unless some sort of incentive is provided.

Possible methods for active large wood placement supported by a majority of committee members in a menu approach include:

Method 1: Placing wood along fish-bearing streams during an adjacent entry for harvesting Some committee members (GS, BA, and SC) felt that harvest should not be the only trigger.

Method 2: Placing large wood along Type N and D streams prone to debris flows that are likely to deliver the wood to fish-bearing streams downstream. Some committee members (LH, PK, and GP) preferred to leave the trees standing so that other RMA functions were retained until natural deliver could take place.

There was little committee support (RC, SC, LH, DN, BR, MS, GS, BA, PK, and GP not supporting) for placing large wood upslope (i.e. in small draws and hollows) of Type N and Type D streams prone to debris flows that are likely to deliver the wood to fish-bearing streams downstream (Method 3). The basis for the lack of support by some committee members is the high degree of uncertainty of eventual large wood delivery to the stream. For large wood that is not placed directly in Type F streams there will be a time lag between when it is placed and when it is utilized for fish habitat. If this time lag is too long the large wood may be at a stage of decomposition where it can no longer provide the same level of function as a “fresh” piece of large wood.

Additional information on this option:

- It is widely believed that current levels of large wood in many streams are significantly lower than what occurred historically. Where riparian areas are generally lacking in large diameter trees the active placement of key pieces from off-site sources can be critical to the creation of habitat functions in the short-term. In order to accelerate the rate of large wood inputs that is occurring under the current rules and measures, additional large wood can be actively placed in the appropriate streams.
- The active placement of large wood is dependent upon the availability of source wood and the cost of placement.
- The 1999 Oregon Plan restoration guide recommends that the large wood for active placement come from outside the riparian management area.
- The opportunity to implement this option may be limited by federal permit requirements.

Benefits:

The most important benefit of this recommendation is the potential for immediate habitat improvement, provided the overall effectiveness of the RMA is not reduced.

The placement of large wood during an adjacent entry for harvesting (Method 1) is an expedient means of achieving immediate habitat improvement, because the equipment necessary for placement is already at the site. An added benefit is that LW can be strategically placed for maximum habitat improvement and retention. In areas well stocked with conifers, felling some trees into or across streams as a part of a thinning operation may also improve the growth potential of the remaining standing trees.
The benefit of Method #2 is that large wood could potentially be delivered to the stream via debris flows, thus reducing the time and cost involved in active placement.

The benefit of Method #3 is that large wood would be available for delivery through debris flows.

Costs:

Landowners/Operators:	Significant, potentially high for some landowners for placement and forgone timber revenue. Incentives, such as basal area credits, in-unit leave tree credits, or tax credits may offset this cost.
State Government:	Insignificant.
Local Governments/Communities:	Large wood inputs may increase downstream risks to developments in or near streams.

There is a direct financial cost to the landowner from the cost of placement and of the material used.

Resources needed:

Rulemaking required. Administrative actions required. Possible incentive legislation needed.

Riparian Functions Option #30: Water Protection Rule Compliance and Effectiveness Monitoring

Objective:

To continue monitoring forest practice water protection rule effectiveness and compliance.

Recommendation:

The committee reached a consensus that additional department resources should be allocated to monitoring the effectiveness of the water protection rules. At a minimum, current levels of monitoring must be maintained. Adequate resources should also be provided to enable the department to conduct effectiveness monitoring related to the large wood objectives of the Oregon Plan for Salmon and Watersheds (OPSW) and water quality standards, as well as continued best management practices compliance monitoring. Coordination with other agencies on monitoring projects is encouraged.

Additional information on this option:

- Monitoring the effectiveness of the forest practice rules in protecting riparian functions must occur in order to understand how the rules are being implemented and to evaluate whether or not they are achieving their objectives. Such work has been the highest priority for the Forest Practices Monitoring Program since the 1994 rule revisions.
- Currently, ODF is also monitoring compliance with the water protection rules**.** This work is part of a broader three-year project to monitor compliance with the forest practice rules in general.
- **IMST recommendation #6** calls for completion the study of the effectiveness of the forest practice rules in providing large wood for the short- and long-term.

Benefits:

Maintaining, and if possible, increasing resources allocated to effectiveness and compliance monitoring will allow a more thorough analysis of the actual effect of the rules related to aquatic large wood and stream temperature issues. This work will also allow for a continuation of ODF compliance monitoring over time and potentially increase the quantity of useful information available to evaluate forest practice rule implementation. Additional resources allocated to monitoring will also allow an evaluation of the implementation and effectiveness of other Oregon Plan measures.

Costs:

Landowners/Operators:	Potential minor increase in harvest tax rates to increase monitoring resources.

State Government:	A stable source of long term funding is needed to maintain or increase monitoring resources.
Local Governments/Communities:	Insignificant.

Resources needed:

Long-term budgetary commitment needed.

A long-term budgetary commitment to monitoring is needed since studies often take more than one biennium to complete successfully. Additional resources are especially needed if the program will be asked to expand its monitoring efforts.

Riparian Function Option #41: Statewide Riparian Management Policy

Objective:

To develop a statewide riparian management policy.

Recommendation:

The committee reached a consensus that the State of Oregon should develop a clearer and more comprehensive policy on riparian management that addresses all land uses. *The committee did not discuss whether such a policy should require uniform protection on all land uses.* However, the policy should, at a minimum, establish a baseline standard for resource protection and both clarify and explicitly describe Oregon's expectations for different land uses if some land uses will be required to meet a higher protection standard than others.

Additional information on this option:

- Currently there are conflicting policies across the state that deal with the management of riparian areas and large wood in streams.
- Riparian vegetation and instream wood protection policies and regulations vary substantially across the state and between different land use sectors. As an example, a number of cities and counties are actively removing large wood to reduce the risks of flooding and property damage. At the same time forestland owners upstream are being asked to put more large wood into streams.
- Inconsistent riparian protection policies may unintentionally be encouraging the conversion of forestland to other land uses, resulting in a potential decrease in fish habitat and water quality.
- Uniform riparian buffers may not be practical and could result in unintended consequences, such as increased pressure to expand urban growth boundaries.
- If a statewide policy explicitly sets different protection goals for different land uses, perhaps the policy could be used as a basis for rewarding, through incentives or tax breaks, those private landowners who are asked to provide disproportionate protection to public resources.
- **IMST recommendation #2** calls for ODF to develop a policy framework to encompass landscape (large watershed) level planning and operations on forests within the range of wild salmonids in Oregon.

Benefits:

A uniform standard of riparian protection across all land uses would spread the burden of managing riparian areas and providing large wood to streams equally among all landowners. There is the potential to increase the total stream miles that provide high quality fish habitat by maintaining vegetation and large wood on streams in land uses that currently do not provide such habitat. Since the majority of large wood originates from areas closest to the stream, this option

will provide significantly more large wood inputs as compared to an equivalent widening of buffers of forestlands only. For example, creating 100-foot buffers on large fish bearing streams regardless of land ownership would provide significantly more large wood as compared to doubling the 100-foot riparian management area on large fish bearing streams on forestlands only.

Costs:

Landowners/Operators:	Potential additional costs for agricultural and urban landowners if additional limitations are placed on the use of their lands.
State Government:	Insignificant.
Local Governments/Communities:	Potentially significant cost if required to expand regulation and riparian protection.

The addition of large wood to some streams in agricultural and urban areas could increase physical hazards to property and public safety. Where additional large wood creates debris dams and diverts stream flows in lowland areas during periods of high runoff, there will be an increase in the potential for flood damage and channel migration.

Resources needed:

Interagency coordination and statutory changes required.

State agency and stakeholder coordination through the Oregon Plan Core Team and the 1999 HB 3393 Large Wood Working Group is needed to begin development of this policy.

"Subcommittee" Riparian Option
(in lieu of Options 26, 38, 62, 63, 64, 65, 66, and 67)

In January 2000, a 6-member subcommittee was appointed by the full committee to address riparian issues. This was difficult work for obvious reasons. The subcommittee met on several occasions and joined in one field tour. The subcommittee's work was conducted with the assistance of facilitators and the Governor's Office. Eventually, a 4-person negotiating team was formed from the subcommittee. Several negotiating sessions were conducted. Ultimately, the negotiating team and the subcommittee came to agreement on the "riparian package" described below.

Objective:

The Riparian Subcommittee did not agree to an objective for this option.

Recommendation:

Ten committee members (WS, SC, RC, BR, BA, GS, DN, LH, GP, PH) support the following proposal. Further clarification and/or guidance on a number of these points will be needed to further develop these concepts.

Riparian Subcommittee
Points of Agreement

1. Harvesting Cap 40%
   In western Oregon, manage any harvesting within the RMA so that the retained conifer basal area exceeds the basal area standard target, or 60 percent of the pre-harvest basal area, whichever is greater.

2. No Touch area ½ of RMA
   The no-touch width will be equal to one-half the width of the entire RMA.

3. Largest Trees 10 out of 20 largest
   Retain 10 of the 20 largest trees per 1,000' outside of the no-touch width that will best achieve aquatic riparian functions. Subject to FPF approval, the landowner would identify tree locations in a written plan demonstrating how this objective will be met. There would be discretion to also consider operational issues and the value of the trees, as long as best achieving aquatic riparian functions remains the primary objective.

4. Type N Streams FPF discretion
   a. Small Type NT streams are: 1. Perennial Small Type N (temperature) streams that are tributary and contribute at least 30% of the flow to small and medium Type F streams and that have a drainage area larger than X acres (basin size to be set be georegion, 40 acres for the coast range). Initial classification will be based on basin size, but landowners may delist streams or stream segments verified as

non-perennial. 2. Small Type N (torrent) streams with drainage basins greater than 30 acres, in which more than 75% of the basin has been mapped as "high" or 50% "extreme" debris flow hazard (by the State Forester) and which have a high probability of delivery to Type F streams.

b. Small NT stream protection: 1. Up to the first 500 feet of Type NT (temperature) stream above the confluence with a Type F will have a 50 foot search zone, each side. Within the search zone, retain 4 square feet of trees per each 100 feet of perennial flow (up to 500') and all non-merchantable conifer on each side of the stream. Trees left along these streams to satisfy the basal area requirement can be counted as in-unit leave trees. 2. "Torrent" type NT streams will be protected as follows - FPF, working with the landowner, has discretion to direct retention of in-unit trees to 50 x 500' search zone (each side).

5. In-growth 25% adjustment for small streams
The standard target will be recalculated for small Type F streams using the same per-acre basal area as large streams, minus 25 percent for in-growth. The standard target will also be recalculated for medium Type F streams, using the same per-acre basal area as large streams.

6. Riparian Specialist
The Oregon Department of Forestry will designate a riparian specialist in each administrative area who will be available to inventory and prepare riparian prescriptions for landowners, at their request. These specialists will be new positions funded by the General Fund.

7. Similar Prescriptions for All Large and Medium Streams
Large and medium Type N stream prescriptions will be the same as the equivalent size Type F's.

8. Monitoring
The effectiveness of the small Type N stream prescription will be a monitoring priority.

9. Alternative Vegetation Retention Prescriptions
The existing alternative vegetation retention prescriptions (e.g., hardwood conversions) may be applied to all riparian management areas (RMA's).

10. Preventing Sediment Delivery
The purpose statement for harvesting rules will be modified to better describe the objective of preventing sediment delivery to channels. The current requirement not to locate skid trails within 35 feet of Type F or D streams will be extended to all streams. Skid trails will be defined as an excavated trail used to yard logs with more than one turn.

11. Layout of Riparian Management Area where a Channel Migration Zone Exists
The riparian management area (RMA) is measured from the current points of measurement except for areas designated by the State Forester as a channel migration zone (CMZ). A CMZ is an unconstrained reach of stream that in the judgment of the

forester is likely to have channel movement that can go outside the RMA widths within the period of a rotation (50-100 years). Within the CMZ, the no touch area will be measured from the high water mark of the channel (same as current rules). The outer edge of the CMZ will be based upon guidance to be developed by a technical committee. Retained trees in the CMZ shall be no less than the basal area standard target.

12. Type N and Small Type F Streams: Landowners would get credit for in-unit leave trees.

13. Conceptual agreement about the use of "stratification."
In recognizing that riparian stands are not homogenous and that applying a single target for the RMA can prevent appropriate management in patches with conifer "over" stocking, the committee agrees to the concept, the details of how to do it in the field are to be developed. Stratification could allow an RMA to be divided into segments with a different management approach applied to each segment; based on the specific conditions in the segment.

14. "Provide for placement of large wood" is supported as a concept. No agreement on details.

Additional information on this option:

The IMST has recommended the following with regard to riparian protection issues:

- Better address flood plains and areas where channels may migrate beyond current areas protected within RMAs.
- Ensure retention of larger trees.
- The target for mature conifer forest should be based upon the characteristics of 160-year-old stands.
- For medium and small streams increase the retention level for conifer trees.
- There is not a scientific basis to treat nonfish-bearing streams differently than fish-bearing streams.

ODF monitoring data has indicated that:

- Variability of riparian stands is great.
- Stocking of conifer, particularly along small and medium sized streams is generally better than assumed in calculating the original basal area targets.
- Changes in measurable shade after harvest are common for small streams, though most changes are less than a 30 percent reduction and are temporary. Pre-operation shade levels may recover within 2 to 3 years after harvest.
- Average diameter distribution does not substantially change after harvest entry.
- A limited number of large trees are selectively harvested from RMAs.
- More often than not, RMAs are not managed under the various options available to landowners.

Other conclusions:

- The incentive most effective to encourage management is the ability to harvest trees, now and in the future.
- Thinning in the short-term can increase tree growth rates and potential large wood delivery in the long-term.
- Thinning in the short-term may reduce the probability of wood delivery and other riparian functions in the short-term.
- Based upon the ODFW stream habitat assessment data, the number of conifer trees in RMAs over 20 inches dbh is relatively low.
- Based upon the ODFW stream habitat assessment data, instream key pieces of large wood (>24 inches) are limited within stream channels.
- Based upon the ODFW stream habitat assessment data, in the coast range, conifer seedlings are rare within the RMAs.
- Other land uses have not generally protected riparian functions at levels near current FPA standards.

Benefits:

The amount of large wood and other riparian function available to streams is likely to be significantly increased in the short-term. The amount of potential large wood left standing within RMAs that will be available in the future will roughly double as compared to what the current rules achieve. The various options available under this proposal maintain flexibility to tailor riparian management prescriptions to site-specific conditions. This flexibility is more likely to better optimize riparian function and emulate historical conditions as compared to the current rules.

Increased vegetation along small Type F and N streams, and along medium Type N streams will provide additional shade levels that in some cases will improve stream temperatures and may provide additional summer habitat for salmonids.

The elements of this option regarding debris torrents are also related *to the committee recommendations under Landslides Options #46 and #61.

Costs:

Landowners/Operators:	Additional costs, significant for many landowners resulting from decreased timber harvest revenue.
State Government:	Significant costs to fund three riparian specialists. (Approximately $500,000 in the first biennium)

Local Governments/Communities:	Potential reduction in harvest tax revenues. Potential effects from movement of increased levels of large wood from forested streams. Significant to local governments that actively manage forestland for timber harvest.

The incentive to actively manage the RMA is reduced. If active management does not occur in those RMAs that can most benefit from it, in terms of maximizing riparian functions, short- and long-term large wood inputs will not be optimized. Landowner costs, in terms of timber not available to harvest, will roughly double as compared to what is not available to harvest under the current rules. Harvesting, roading, and silvicultural costs will increase due to the increase in extent and content of RMAs.

Incentives available to encourage restoration each will be reduced.

Resources needed:

A quantitative analysis of timber and acreage values impacted and benefits provided. Funding for three riparian specialists. Staff time and resources to complete rulemaking, training and monitoring.