

Appendix R
HB-1309 Ecosystem Standards
For State Owned
Agricultural and Grazing Land

ROSE MARIE WINTERS
Chair



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CONSERVATION COMMISSION

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DATE: December 30, 1994

TO: House Natural Resources Committee Members
Senate Natural Resources Committee Members

FROM: Rose Marie Winters, Chair *Rose Marie Winters*
Washington State Conservation Commission

SUBJECT: Transmittal of Approved HB1309 Ecosystem Standards
for State-Owned Agricultural and Grazing Lands

The Washington State Conservation Commission is pleased to transmit the attached report, "HB1309 Ecosystem Standards for State-Owned Agricultural and Grazing Lands," along with its approval of the standards and the consensus process used to develop the standards. The report was prepared at the direction of the 1993 legislature which asked the Commission to appoint a technical advisory committee to develop standards to benefit fish and wildlife habitat on agricultural and grazing lands owned and managed by the Departments of Natural Resources (DNR) and Fish and Wildlife (WDFW). The 1993 legislature asked that the standards be developed by December 31, 1994.

The Commission appointed a twenty-five member advisory committee after soliciting nominations from stakeholder organizations and agencies. The committee included representatives of farming, ranching, fishing, public utility, and environmental groups; Tribal governments; and natural resources agencies.

Based on a long time commitment to collaborative problem solving, the Commission asked the committee to use a consensus decision making process that supported open discussion issues, respect for differences, and the right to disagree. The committee adopted ground rules including a definition of consensus as decision making that allows every member to say "I can live with the decision and accept it, even though it may or may not be exactly what I want." The Commission believes that the standards reflect the committee's commitment to a fair and open consensus decision making process.

The Commission also believes that the standards are technically sound and will encourage and support increased coordination among state lessees, natural resources agencies, and tribes. The standards provide a common set of policy guidelines that can be used to select site specific practices that will maintain and restore fish and wildlife habitat on state lands. We recognize that, while the implementation of practices that achieve the standards will increase the productivity of these lands, DNR and WDFW may need to come to the legislature for funding for staff to carry out the initial review of existing leases and work with lessees to develop site specific management plans.

The Commission is committed to working with the legislature, agencies, and tribes to achieve the standards on state lease lands. Thank you for the opportunity to use consensus building as a positive way to resolve public policy issues facing the state and its citizens.



EXCERPTS FROM HB1309

Passed by the 1993 Washington State Legislature

The legislature finds -

"There is a continuing loss of habitat for fish and wildlife.

"The development of coordinated resource management plans will improve the stewardship of these lands and allow for increased development and maintenance of fish and wildlife habitat.

The legislature directs -

"The department of wildlife and the department of fisheries [now merged as the department of fish and wildlife] to develop goals for the wildlife and fish that these agencies respectively manage, to preserve, protect, and perpetuate wildlife and fish on shrub steppe habitat or on lands that are presently agricultural lands, rangelands, or grazeable woodlands. These goals shall be consistent with the maintenance of a healthy ecosystem.

"The conservation commission shall appoint a technical advisory committee to develop standards that achieve the goals developed [by the department of fish and wildlife].

"The conservation commission shall approve the standards and provide them to the departments of natural resources and wildlife, each of the conservation districts, Washington State University cooperative extension service, and the appropriate committees of the legislature. The conservation districts shall make these standards available to the public and for coordinated resource management planning. Application to private lands is voluntary.

"The department of natural resources and the department of wildlife shall implement practices to meet the standards on agency-owned and managed agricultural and grazing lands."

Washington Laws, 1st Special Session, Chapter 4, Sections 5-6

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WDW and WDF combined as WDFW 3/94

We want to thank state legislators who established the ESAC advisory committee with the faith that many different and diverse interests could work together to carry out the task of developing standards for the restoration and maintenance of fish and wildlife habitat in the state of Washington.

Farmers and ranchers who have and will adopt conservation plans and implement practices on private lands are also acknowledged and appreciated for their stewardship and willingness to act voluntarily to benefit fish and wildlife.

CONSENSUS/NONCONSENSUS STATEMENT

Consensus During early meetings, the HB1309 Ecosystem Standards Advisory Committee (ESAC) adopted ground rules for their decision making process. Ground Rule #6 (See EXHIBIT D) addressed the issue of what ESAC would do if consensus was not reached. Although using a consensus decision making process was difficult (because each ESAC member represented a different constituency and different opinions, priorities, interests, and values), ESAC was able to reach consensus on all but one ecosystem standard.

Nonconsensus The Washington Cattlemen's Association (WCA) did not support Ecosystem Standard B14: Riparian Management Zone (RMZ). To keep the WCA in the process, ESAC agreed to include an upfront nonconsensus statement written by WCA. The statement below reflects the opinion of the WCA and has not been challenged or modified by other ESAC members in any way:

The Washington Cattlemen's Association (WCA) nonconcurs on the HB 1309 Standard for establishment of Riparian Management Zones. It is the position of the WCA that Riparian Management Zones beyond the normal riparian constitutes a taking of DNR lands. Such a taking of land violates the DNR trust mandate by negatively impacting their beneficiaries. There is significant legal precedence to support this assertion. The Washington State Supreme Court rule in the care of County of Skamania v. State, 102 Wn 2d 127 (1984) that when the state enacts laws governing trust assets, its actions will be tested by fiduciary principals: the court went on to define the State's fiduciary duty as one of "undivided loyalty" to the trust beneficiaries. The state is obligated to seek full value of the assets of the trust. The court emphasized the state "may not sacrifice this goal (of maximizing the value of trust assets) to pursue other objectives no matter how laudable those objectives may be." The Riparian Management Zone Standard places restrictions on the DNR management to maximize the value of trust assets.

SUMMARY

This report presents ecosystem standards that are intended to maintain and restore fish and wildlife habitat by improving ecosystem health on agricultural land, rangeland, and grazeable woodland managed by the Washington Department of Natural Resources (DNR) and the Washington Department of Fish and Wildlife (WDFW). The ecosystem standards are goals that the land manager should be working towards to achieve the desired ecological condition as defined under the standard.

Land managers and users of state-owned agricultural land, rangeland, and grazeable woodland who will be directly impacted by these standards are the target audience for this report. Natural resource agencies, private landowners and managers who choose to apply these ecosystem standards voluntarily, and other individuals and organizations concerned with renewable resource protection and management may also be interested in this report.

How to Use This Report

Most sections of this report are self-explanatory. However, to fully understand the intent of the standards, as a whole, we recommend reading the **GUIDELINES** first before turning to individual standards. The **GUIDELINES** provide an overall framework that ties the standards together and information that applies to more than one standard. In addition to the standards, this report includes Resources) a **GLOSSARY** (Acronyms and Definitions), **REFERENCES** and **EXHIBITS**. See **TABLE OF CONTENTS**.

Legislative History

These ecosystem standards were developed at the direction of the 1993 legislature under the provisions of HB1309, Sections 5 and 6, (EXHIBIT A) by a technical advisory committee under the guidance of the Washington State Conservation Committee (WSCC). The committee included representatives of farming, ranching, fishing, public utility, environmental groups, and natural resource agencies.

The legislation directed WDFW (at that time two separate departments of fisheries and wildlife) to develop goals to be addressed by the ecosystem standards (EXHIBIT B). WSCC was directed to adopt the standards by the end of 1994 and provide them to the appropriate legislative committees, WSU cooperative extension service, and local conservation districts. Conservation districts are directed by the legislation to make the standards available to the public and for coordinated resource management planning.

The legislature directed WSCC to provide the standards to DNR and WDFW; and directed these agencies to include practices that address the standards in all agriculture and grazing leases beginning in 1995. The enabling law requires DNR "to implement practices necessary to meet" the ecosystem standards "consistent with the trust mandate of the Washington state Constitution and Title 79 RCW." DNR serves as trustee of lands given to the state by the federal government for the

SUMMARY (Continued)

purpose of financially supporting state schools and institutions. As trustee, DNR has an obligation to provide for all generations without unduly favoring present or future beneficiaries.

The application of these ecosystem standards to grazeable woodlands is limited to activity under agricultural and grazing leases or permits. The ecosystem standards do not apply to forest management activities covered under the forest practices act.

HB1309 Ecosystem Standards Advisory Committee (ESAC)

After developing selection criteria (EXHIBIT C) and soliciting nominations from stakeholder organizations and agencies, the WSCC appointed 25 committee members. The advisory committee worked for more than one year to develop the 25 ecosystem standards included in this report. To emphasize that the standards are interrelated and address ecosystem health, the committee named itself "HB1309 Ecosystem Standard Advisory Committee" (ESAC) and refer to the standards as "ecosystem standards."

During early meetings, ESAC adopted ground rules (EXHIBIT D) and a goal statement including criteria for the standards (EXHIBIT E). Three Sub-committees (Cropland, Rangeland and Grazeable Woodland, and Riparian Areas and Associated Waters) drafted ecosystem standards that were edited and refined by the total ESAC committee. A Format Sub-Committee worked to organize a "user-friendly" final report.

HB1309 Ecosystem Standards for Ecosystem Health

For convenience the ecosystem standards are grouped by type (Related Laws, Land Management Standards, and Aquatic Evaluation Standards). See TABLE A. In application, the standards are interrelated and interdependent targets or indicators of ecosystem health. The laws that are included as ecosystem standards under Related Laws are legal requirements that must be met by all land owners. The intent of other ecosystem standards (included as Land Management and Aquatic Evaluation Standards) is achieved by a land manager/user selecting and implementing site specific practices that result in maintaining or making measurable progress towards achieving the desired ecological conditions described by each of these ecosystem standards that applies to the land managed.

HB 1309 Ecosystem Standards to be Approved by WSCC

A draft report was distributed for public comment during November 1994. ESAC reviewed the comments and made changes to address major concerns. The WSCC adopted the final standards report as policy guidelines on December 28, 1994.

BENEFITS TO FISH AND WILDLIFE

This section describes how implementing practices to achieve the ecosystem standards will benefit fish and wildlife habitat. Specific problem and benefit statements are also included with each ecosystem standard.

Many land use activities that contribute to the deterioration of ecosystem health and the loss of fish and wildlife habitat by destroying plant cover, increasing soil erosion, contaminating water and eliminating structural diversity. The ecosystem standards address the impact of land management practices only on agricultural land, rangeland, and grazeable woodland owned and/or managed by DNR and WDFW. Implementing practices that address these ecosystem standards is an opportunity to contribute to the maintenance and restoration of fish and wildlife habitat on state lands, however, to improve and maintain fish and wildlife habitat throughout the watershed will require cooperation of all landowners and managers.

Fish and Wildlife Needs

Fish need an adequate supply of good quality water; stream channel stability; in-stream structures (logs, rock outcroppings) that trap and retain gravel for stable spawning and form pools for resting and rearing; access between these areas; and food sources. Wildlife need good quality water, feeding, breeding, rearing, and resting areas; as well as protected travel corridors between these areas. Most of these requirements can be met by providing diverse vegetative structure associated with waterbodies. Specific needs of some individual species are included in Management Recommendations for Washington's Priority Habitats and Species, WDFW.(1)*

Riparian and Uplands Both Part of Watershed Ecosystem

Riparian areas and uplands are interrelated parts of a watershed ecosystem. The health of this riparian-upland ecosystem, which provides fish and wildlife habitat, is affected by management activities in both uplands and riparian areas. See GLOSSARY for the definition of "Riparian" adopted by the Advisory Committee.

Healthy Riparian Area Important to Fish and Wildlife

Although riparian areas occupy only a small percentage of a watershed ecosystem's total area, the importance of a healthy riparian ecosystem to fish and wildlife is much greater than its size suggests. A healthy riparian ecosystem offers more habitat diversity for wildlife than uplands because it is the interface (or edge) between the aquatic habitat and the upland habitat and thus contains elements of both these habitats. More wildlife species (not necessarily more total numbers of animals) can be found in these edges than in the adjacent habitats.

In Washington State, at least 90 percent of the mammal, reptile and amphibian species "concentrate essential life activities in or near the

* Numbers in parentheses refer to references listed on pages 77-8.

BENEFITS TO FISH AND WILDLIFE (Continued)

riparian area." (2,3,4) Up to 98 percent of the state's bird species use riparian areas to varying degrees. Six species of "small mammals" (e.g., beavers), two species of carnivore (mink, river otter), 41 species of birds, and nearly 80 percent of amphibian species are considered "riparian obligates." (5,6) Riparian obligate species cannot survive without a healthy riparian area because at least one part of their life cycle depends on it. Since riparian areas also provide natural connection between waterbodies and upland plant communities they function as protected travel corridors between foraging areas, breeding areas, and seasonal ranges for wildlife species.

A healthy riparian habitat is also important for fish. The number of fish species that a stream can produce and maintain is directly related to the complexity of the stream and the complexity of the stream is heavily influenced by the quality of the riparian area. In particular, this complexity (structural diversity), can affect how many salmon and trout the stream can support. Approximately 70% of the structural diversity within the aquatic ecosystem is derived from the trees and limbs which fall into it (from the adjacent riparian ecosystem). (7,8,9) Rearing and resting pools are formed when the stream spills over and under these fallen trees ("large woody debris", or LWD).

The LWD increases the stability of the stream by trapping and retaining spawning gravels, slowing the velocity, directing the flow away from eroding banks, and reducing its "down-cutting" capabilities. Stream stability is maintained by a healthy riparian ecosystem which includes woody and herbaceous vegetation that holds the streambanks together with its root system and limits the amount of sediment which enters the channel. In addition, as the stream spills over the LWD it adds life-supporting oxygen to the water. Juvenile salmon and trout use exposed root systems of both live trees, growing on undercut banks, and dead trees, which have fallen into the channel, as feeding and hiding areas.

The adjacent riparian ecosystem supplies as much as 99 percent of the organic material that supports the base of the aquatic food web. (10,11) The riparian ecosystem supports both terrestrial and aquatic insects which are the basic food of salmon and trout. Many of these aquatic insects feed on deciduous leaves and conifer needles which fall into the water. Riparian plants can also be important in the reproductive cycle of many aquatic insects. The number of species and size of the population of aquatic insects (therefore, the amount of food for fish) is also related to the structural diversity of the stream and the health of the riparian ecosystem.

BENEFITS TO FISH AND WILDLIFE (Continued)

A healthy riparian habitat shades the stream and is the primary means of keeping the water cool enough in the summer to support salmon and trout, as well as many of the aquatic insect species. A healthy riparian habitat can also help keep streams warmer in the winter. A well-vegetated riparian area acts as a filter system to stop pollutants resulting from upland activities from entering the stream. The lower canopy of brush which grows along the channel makes it more difficult for predators, such as herons and raccoons, to capture fish. During floods, fish use brush and trees, growing in the flood plain, for refuge from the current. The riparian habitat also acts as a water storage area that gradually releases water back to the channel.

Many of these riparian qualities also benefit the land owner by maintaining stable, year-round flows; reducing flood impacts; providing forage for livestock; and keeping the water clean.

Upland Management Activities Important to Fish and Wildlife Habitat

Riparian areas are closely interrelated with the surrounding watershed features. The majority of a watershed consists of upland areas that profoundly influence the ultimate character of downslope riparian areas. Therefore, upland management activities, including agriculture and grazing practices, play a critical role in maintaining and restoring fish and wildlife habitat within the ecosystem.

Upland management activities on agricultural land, rangeland, and grazeable woodland that positively or negatively impact ecosystem health and fish and wildlife habitat include crop selection, location, cultivation and harvest methods; fertilizer and pesticide application; animal waste management at stockyards, feed lots, and pastures; grazing management; irrigation flow diversions and returns; channelization of streams and wetlands; drainage of wetlands; and stream crossings (e.g. bridges, culverts and fords).

Good management practices reduce soil and streambank erosion; stream sedimentation, turbidity and pollution; and flooding potential. Maintenance and restoration of natural vegetation improves plant vigor, plant species diversity and water quality. Streams and wetlands have more water available in dry summer months. These practices ultimately benefit fish and wildlife by creating and maintaining breeding, feeding, resting and hiding areas for both fish and wildlife. Vegetation gives wildlife safer travel corridors between these areas.

Practices that maintain and improve ecosystem health and fish and wildlife habitat can also benefit the landowner/user by increasing site productivity for livestock and reducing costs related to streambank erosion, sedimentation, flooding and runoff.

COSTS/BENEFITS

In addition to benefiting fish and wildlife, implementation of practices that achieve these standards should increase the productivity of the land. Costs of implementation may include: 1) reevaluation of state land leases; 2) development of site specific management plans; 3) training and technical assistance; 4) implementation of plans; 5) monitoring and evaluation; and 6) public education.

Existing cost share monies may be available to support implementation of practices. DNR and WDFW may need to determine up-front and on-going resources needed and report these needs to the legislature.

GUIDELINES

These guidelines answer common questions without repeating information in each ecosystem standard. For this reason, it is important to read these GUIDELINES before looking at individual ecosystem standards.

Ecosystem Standards are an Interrelated System

The ecosystem standards are interrelated and interdependent as are all elements of an ecosystem and should be viewed as a system. Managing to achieve a single standard may lead to maintenance or improvement in other ecosystem features, both directly and indirectly related; for example, a land manager/user may manage for improved riparian vegetation conditions. The resulting riparian vegetation will affect factors addressed by other standards, such as stream shading, water temperature, bank stability, siltation, surface flow, gully formation.

To achieve all standards applicable to a given area, it may be necessary to use some specific management practice for each individual standard. The objective is a functioning ecosystem that supports healthy populations of fish and wildlife while maintaining site features and productivity that meet the objectives of the land manager for sustainable land management.

Implementation of Ecosystem Standards

DNR and WDFW are the agencies responsible for implementing these standards. The factors which may affect the implementation and the amount of progress made towards achieving these standards will depend on current knowledge and technology, site potential, and funds available to both the agencies and lessees for implementing these standards. The intent of the ecosystem standard is achieved by implementing site specific practices that result in maintaining or making measurable progress towards achieving the desired ecological conditions described by each ecosystem standard that is applicable to the land managed.

Ecosystem Standards Apply to DNR and WDFW Lands; Voluntary on Private Lands

Land managers and users of state-owned agricultural land, rangeland, and grazeable woodland will be directly affected by these ecosystem standards and are the main intended audience for this report. Other natural resource agencies, private land owners and managers, as well as individuals and organizations concerned with resource conservation and management may also be interested in the information presented. Private land owners and managers can voluntarily choose to apply these standards in their land management.

GUIDELINES (Continued)

One Land Manager Cannot Solve Entire Problem

State-owned lands will often be only a small part of a given watershed. No single land manager/user can or should be responsible for solving problems that belong to an entire watershed. In cases where the land manager/user cannot solve the problem individually, an ecosystem standard is met when the actions of the land manager/user do not contribute to maintaining or creating ecological conditions less than described by the standard.

Ecosystem Standards Support Coordinated Planning

The ecosystem standards are intended to support a watershed and coordinated resource management planning approach to ecosystem health. Land managers/users are encouraged to work with natural resource agencies, tribes, adjacent land managers/users, and interested citizens to develop coordinated resource management plans to promote ecosystem health in their management area or watershed.

Consultation in relationship to a specific strategy means that DNR and WDFW may contact appropriate natural resource agencies and tribes and involve them in plan development. The final decision rests with the responsible land management agency.

Ecosystem Standards Support Adaptive Management

These ecosystem standards are based on current scientific literature. They were derived from a combination of existing standards and conditions observed in healthy or unmanaged habitats. Scientific understanding is seldom complete. It improves over time. The standards are not intended to prescribe practices. For this reason, land managers/users are encouraged to select, implement, and revise practices that address standards using an adaptive management approach based on the best available practices and evaluation tools. An approved NRCS conservation plan developed in consultation with other state natural resource agencies and affected tribes is encouraged.

Site Potential

A number of ecosystem standards and strategies refer to "site potential." ESAC adopted the following definition for this term:

The perennial native or desirable non-native plant species a site can produce and/or sustain naturally without artificial addition of moisture or nutrients. Factors that affect site potential include: soil type and depth; soil fertility; precipitation and other weather factors; and topography, including channel shape. Approximate site potential can be determined by a comparison of site factors to relatively undisturbed areas with similar conditions or descriptions of similar sites in scientific literature.

GUIDELINES (Continued)

The primary goal of these ecosystem standards is to maintain and restore fish and wildlife habitat by improving ecosystem health. An ecosystem standard that calls for the "approximation of site potential" is met at that point beyond which no further benefit to fish and wildlife can be anticipated from an even closer approximation of site potential.

Site Specific Flexibility

The enabling law provides that the standards may be modified on a site-specific basis... to achieve the fish and wildlife goals as determined by the WDFW (EXHIBIT B). Land managers/users who encounter specific circumstances under which the application of an ecosystem standard could have consequences detrimental to the achievement of important fish and wildlife objectives should work with state natural resource agencies regarding modification. See EXHIBIT A: HB1309, Sec. 5, Para. 5 and Sec. 6. Modifications of standards under this provision should be consistent with the intent and scope of ecosystem standard developed by ESAC. These limitations are essential to maintain ESAC integrity and the consensus process to which ESAC members were committed.

ESAC further recommends that the Coordinated Resource Management (CRM) consensus model be utilized in the site specific review and standard modification process. This means including the lessee and other entities noted in the statute, as full participants. Final responsibility and authority regarding the standard modification rests with the land management agencies (DNR and WDFW).

Construction

A number of standards (e.g., streambank erosion, stream channel sinuosity, stream channel width to depth ratio) should not be interpreted as requiring the use of heavy equipment to meet their intent.

Where instream or in-channel construction is necessary or desired, construction should be accomplished under an approved plan developed in consultation with the land manager/user, appropriate natural resource agencies, and affected tribes. Land managers/users are required to work with the WDFW to meet the permit requirements of the state hydraulic code, as well as other local, state, or federal agencies and tribes to meet their permit requirements.

GUIDELINES (Continued)

Laws and Ecosystem Standards

Ecosystem standards are intended to complement and be compatible with existing laws. If an ecosystem standard does conflict with existing or future laws, the land manager/user is responsible for following the law.

Some existing state, federal, or local laws are included because they address specific fish and wildlife sub-goals of WDFW. Including them, even though they are currently law, is intended to inform land managers/users about the legal requirements on these issues and especially their importance to fish and wildlife.

Permits, Licenses, and Requirements

The land manager/user is responsible for following all laws and meeting all local, state and federal permits and licensing requirements. Implementing practices to achieve these ecosystem standards does not provide any special authority. Some of the common permits and licenses a land manager/user may require, depending on the activity, include (but are not limited to):

Local: Clearing and grading, Shorelines, Critical Area Ordinances, SEPA.

State: DOE (Shorelines and SEPA oversight, Temporary Water Quality Modification, Water Quality Certification for 404 Permit, NPDES, Water Rights); DNR (Forest Practices); WDFW (Hydraulic Code); Department of Agriculture (Application of Pesticides).

Federal: Army Corps of Engineers (404 and Section 10); Soil Conservation Service (Delineation of Wetlands on Agriculture Land; USDA Food Security Act); USFWS and NMFS (Section 10 Taking Under ESA).

Ecosystem Standards Format

Each ecosystem standard includes four components. To understand the meaning and intent of each ecosystem standard, it is important to read all of the components. To emphasize the interrelationship of the components, each ecosystem standard is presented in a box. The components are described below:

1. DESIRED ECOLOGICAL CONDITION

The desired ecological condition is a concise statement of the standard's intent to maintain or restore sufficient habitat to preserve, protect, restore, and perpetuate fish and wildlife.

2. STRATEGY

The strategy guides the land managers/users from the desired ecological condition to the selection of management practices that can be used to achieve the ecosystem standard. While the strategy

GUIDELINES (Continued)

format may vary between ecosystem standards, it provides, in all cases, additional direction to the land manager/user responsible for achieving these ecosystem standards. That direction may be general information that clarifies the intent of the ecosystem standard; it may suggest certain activities or practices available to the land manager/user to achieve the ecosystem standard; or it may describe a benchmark or an evaluation tool needed to measure performance or accomplishment of the ecosystem standard.

3. RATIONALE/ DISCUSSION

This section includes a brief problem statement specific to the ecosystem standard; a brief statement on how the specific ecosystem standard will benefit fish and wildlife; and a clarification of the rationale and intent of the ecosystem standard based on the discussion of ESAC and ESAC Sub-Committees.

4. Possible Management Practices

Practices are management tools selected by the land manager/user based on site specific inventory and management objectives selected to maintain or improve ecosystem health. The ecosystem standards are not intended to dictate specific management practices that must be implemented. Management practices that are written into law, however, and included as standards (e.g., water diversion device screening, fish passage/in stream structures, noxious weed control) are the only exception.

Some examples of possible management practices (options) to land managers/users is included with each ecosystem standard. The list is not intended to be comprehensive and land managers/users are encouraged to use innovative problem solving approaches and also to contact resource agencies for technical assistance in identifying and selecting management practices.

Ecosystem Standards Grouped by Sections

Although ecosystem standards are interrelated and should be viewed as a system, for convenience they are grouped into three sections: 1) RELATED LAWS; 2) LAND MANAGEMENT STANDARDS; and 3) AQUATIC EVALUATION STANDARDS.

TABLE 1: RELATED LAWS AND ECOSYSTEM STANDARDS

Read GUIDELINES First It is important to read the guidelines located in front of this table before reading individual standards. The guidelines provide an overall framework that ties the standards together and discussions that relate to more than one standard. Ecosystem standard numbers include a letter referring to the section. Related laws are also identified by an asterisk (*).

Section A: RELATED LAWS

A1. * Noxious Weed Control	23
A2. * Stream Temperature	24
A3. * Fish Passage/In Stream Structures	25
A4. * Water Diversion Device Screening	26

TABLE 2. Other Laws Referenced in Ecosystem Standards

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B15. Plant Community Status/Condition - Riparian	42
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C23. Fine Sediment in Spawning Gravel	55
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SECTION A

RELATED LAWS

RELATED LAW A1: * Noxious Weed Control

NOXIOUS WEED LAWS Land managers/users must comply with state and local weed control laws. (RCW 17.10, State Noxious Weed Law; WAC 16.750, State Noxious Weed List and Schedule of Monetary Penalties; Local weed control ordinances.)

STRATEGY 1. Manage for native plant species and/or desirable non-native plant species that occupy the site. 2. Prevent noxious weed invasion by management practices which discourage their establishment. 3. Control should concentrate on early detection and action while a potential problem is still small. 4. Review control strategies and select the one(s) which will solve the problem with least impact to desirable vegetation. 5. Treat target plant species so as to avoid damage to desirable vegetation and fish and wildlife.

RATIONALE/DISCUSSION Noxious weeds can degrade site potential for plant species desirable for fish and wildlife as well as species beneficial for forage production. This law is intended to prevent or minimize noxious weed invasion.

WAC 16-750 includes the state noxious weed list and schedule of penalties for owners who fail to control weeds on their land. A license is required by the Washington Department of Agriculture to apply "restricted use chemicals" for weed control. The Washington Department of Ecology (DOE) requires a Temporary Water Quality Modification Permit for chemical weed control in or near open water. If a herbicide is used, label instructions must be followed.

Possible management practices: Pest Management. Land managers/users can contact their local weed district board for information about local weed control regulations and suggested management practices.

RELATED LAW A2: * Stream Temperature

STREAM WATER TEMPERATURE REGULATIONS Land managers/users must meet state water temperature requirements, based on classes defined in the regulations. State Water Quality Standards - Surface Water. WAC 173-201A-030(1)(b)(iv).

STRATEGY Maintain or restore upland and riparian vegetation consistent with site potential as defined by other ecosystem standards.

RATIONALE/DISCUSSION Both high and low stream water temperatures can kill or stress fish and insects that fish eat. High temperatures for long periods of time may kill both adult and juvenile fish by magnifying the effects of disease and infection; and reducing reproductive success. Warm temperatures also block or delay downstream juvenile migration and migration of adults returning to spawning beds. Adults that cannot reach preferred spawning beds will spawn in sub-standard reaches which decreases egg and fry survival. Delayed juvenile migrants lose migratory instinct and ability to adapt to saltwater, and often become prey to other wildlife.

Lethal and sublethal low water temperatures can negatively impact fish. Fish will avoid seemingly suitable winter rearing habitat due to low water temperatures. Anchor ice resulting from low water temperatures eliminates water flow, including flow of oxygen over eggs; and, when it breaks up, scours streambeds and eliminates pools. Low stream water temperature is often the result of little or no streamside vegetation. Vegetation, particularly upper and middle story height shrubs, and trees, helps moderate stream temperature by shading the water surface.

This law is intended to maintain or restore winter and summer temperatures necessary for successful spawning, rearing, and migration of fish. State law requires land managers/users to meet existing water quality standards based on classification of the quality of waterbodies. See WAC 173-201A.030(1)(b)(iv).

Implementing practices that address pools, width to depth ratio, erosion, vegetation and instream flow will also affect stream temperature.

Possible management practices: Critical Area Planting, Deferred Grazing, Fencing, Filter Strips, Livestock Exclusion, Proper Grazing Use.

RELATED LAW A3:
*** Fish Passage/Instream Structures**

CULVERT AND INSTREAM STRUCTURE REGULATIONS Culverts and other instream structures must meet state regulations for fish passage. RCW 75.20, Hydraulic Code.

STRATEGY 1. Ensure unimpeded up and downstream passage for adult and juvenile fish. 2. Culverts and other instream structures meet current WDFW criteria which address migration needs; design criteria, including size, slope, and elevation; and general design considerations. 3. Where feasible, alternative accesses, bridges, and reduced number of stream crossings are preferred over the use of culverts.

RATIONALE/DISCUSSION Culverts and other instream structures (e.g., dams, bridges, fords) may be impassable for fish because they are blocked by debris, situated too high above the streambed or have a slope that is too steep. Instream structures must be designed with consideration for fish passage needs. Impassable culverts and other instream structures block fish from using desirable and suitable habitat. This law is intended to help provide for unimpeded passage upstream and downstream to and from available habitat, for resident and migratory fish.

The Washington State Hydraulic Code, RCW 75.20 requires all instream structures, such as culverts and dams, to provide unimpeded fish passage. These law apply to both new and existing instream structures which are currently a blockage to fish passage. In addition, RCW 75.20 requires that all new culvert and instream structure installations and modifications of existing structures be approved by WDFW, through a Hydraulic Project Approval (HPA). Criteria (practices) are developed and updated periodically by WDFW. Land managers may contact WDFW for a copy of current criteria.

WDFW staff can provide evaluations and technical assistance to land managers. WDFW recommendations address fish passage needs, not engineering requirements. Fish passage requirements for culverts and other structures, however, usually are greater than needed to pass the expected volume of water.

Required management practices: WDFW Criteria.

**RELATED LAW A4:
* Water Diversion Device Screening**

STATE WATER DIVERSION DEVICE SCREENING REGULATIONS Water diversion device screening must meet state regulations. RCW 75.20, Hydraulic Code.

STRATEGY 1. Prevent fish entrainment, impingement, stranding, and pump mortality.
2. Contact WDFW for screening evaluation and technical assistance.

RATIONALE/DISCUSSION Screens prevent fish from being drawn into pumps and entering diversions. Without screening, adult and juvenile fish can become stranded in diversion channels when irrigation flows are shut off.

Washington State Hydraulic Code, RCW 75.20 requires water diversion devices, including pump intakes (regardless of size) and ditch diversions, to be properly screened to prevent stranding and loss of resident and migratory fish. The law applies to both new and existing unscreened diversions. The land manager/user is not responsible for screening if the primary diversion has already been screened and no additional fish bearing waters enter the system between the primary diversion and the land manager/user's diversion. If, however, adult or juvenile fish can enter the diversion channel from its downstream confluence with the receiving waters, appropriate measures must be taken.

Criteria (practices) for implementing the law are developed and updated periodically by WDFW. Current criteria address location of diversion device within the waterbody and screen location within the device; approach and sweeping velocities; minimum screen area; screen mesh size, shape and type of material; screen cleaning and juvenile bypass systems. Land managers/users may contact WDFW for a copy of current screening criteria.

It is the land manager/users legal responsibility to ensure that both new and existing structures do not impede fish passage and are properly screened. The land manager/user is ultimately responsible for the costs of screening. At the present time, WDFW Yakima Screen Shop may provide technical assistance, including screen design, construction, and installation. Cost-sharing options may be available.

Required management practices: Current WDFW screening criteria.

TABLE 2: OTHER LAWS RELATED TO ECOSYSTEM STANDARDS

Laws that are included as ecosystem standards (A1 - A4) and in this table are legal requirements that relate to healthy ecosystems and fish and wildlife habitat. These laws apply to all private landowners/users, not just DNR and WDFW owned lease lands.

This list is selective - not a complete list of all applicable laws. The laws are included here 1) to address specific WDFW fish and wildlife sub-goals (See Exhibit B); and 2) to inform land managers/users about legal requirements that need to be considered in land management planning and decision-making.

Laws repeated as ecosystem standards are listed before this table, in numerical order. Other laws are listed alphabetically by key words. A brief description of each law is included followed by the cite and ecosystem standards that refer to the law.

In-Stream and Streambank Construction Projects Land managers/users must get a Hydraulic Project Approval, (HPA) from WDFW for projects that will use, divert, obstruct, or change the natural flow or bed of salt or fresh waters of the state. Projects requiring permits include, but are not limited to, irrigation diversions and pumps; stock watering diversions; water storage; streambank stabilization; and installation replacement or repair of outlets that discharge directly into a stream. RCW 75.20, Hydraulic Code. Ecosystem Standards B7: Water Discharge Outlets, B13: Streambank Erosion, C23: Stream Channel Pools, B16: Stream Channel Sinuosity.

Toxic Substances Federal and state laws limit the amounts of specific substances which can be introduced into fresh and marine surface waters. WAC 173-201A-040, Water Quality Standards, Surface Waters. RCW 90.48. Title 33 Chapter 1251-1387, Federal Clean Water Act. Ecosystem Standards B5: Soil Additions, B7: Water Discharge Outlets.

Water Discharge Outlets Projects to install, replace or repair water discharge outlets that discharge directly into a stream require a Hydraulic Project Approval (HPA) from WDFW. See **Instream and Streambank Construction Projects** above. Ecosystem Standard B7: Water Discharge Outlets.

Water Measuring/Metering State law was changed in 1993 to require most water right owners to measure and regulate the flow of water diverted in excess of one cubic foot per second from waters in which salmonid stock status is depressed or critical as determined by WDFW. DOE is developing rules to implement the metering requirements RCW 90.03.360 and 1993 c 4 s 12, 2558. Ecosystem Standard B22: Water Efficiency.

Water Quality Standards Surface waters must meet specific water quality criteria related to fecal coliform; dissolved oxygen; dissolved gas; temperature; Ph; turbidity; toxic, radioactive, or deleterious material concentrations; and aesthetic values (not offensive to sight, smell, touch, or taste). WAC 173-201A-030. Ecosystem Standards B7: Water Discharge Outlets, B8: Storm Water Runoff/Water Discharge.

SECTION B

LAND MANAGEMENT

STANDARDS

ECOSYSTEM STANDARD B5: Soil Additions

DESIRED ECOLOGICAL CONDITION Human-applied organic and inorganic substances do not move into surface or groundwater.

STRATEGY 1. Apply organic and inorganic substances in balance with plant requirements considering all other nutrient sources, soil characteristics and climatic factors that affect movement of this material from the site. 2. Follow federal, state, and local laws concerning the application of chemical, pesticides, and herbicides. 3. Follow label instructions on commercial products. 4. Use additional care within 100 feet of perennial and intermittent waterbodies. 5. Noxious weed or pest control in riparian areas and near open water is acceptable as long as users follow product label restrictions and obtain required permits.

RATIONALE/DISCUSSION Organic and inorganic substances that enter surface and groundwater diminish water quality and harm or kill fish as well as plants and insects that fish and wildlife eat. This ecosystem standard is intended to allow land managers/users to accomplish their land use objectives while limiting the use of applied organic and inorganic substances to that amount which will minimize leaching of contaminants into the groundwater and runoff into waterbodies. This ecosystem standard is also intended to help restore and maintain water quality.

State laws regarding the application of chemicals are stronger than federal laws and require the user to have a license, training, and recertification.

Land managers/users may be faced with unforeseen or uncontrollable events such as cloud bursts or very strong winds that result in unintended movement of contaminants.

Possible management practices: Conservation Cropping Sequence, Irrigation Water Management, Nutrient Management, Pest Management.

ECOSYSTEM STANDARD B6: Mass Soil Movement

DESIRED ECOLOGICAL CONDITION Mass soil movement, e.g. mudslides, slumps, debris torrents, does not occur.

STRATEGY Identify and treat existing and potential mass soil movement sites.

RATIONALE/DISCUSSION Movement of large amounts of soil in both upland and riparian areas eventually contribute to sedimentation of waterbodies. Sediment is a major contaminant that diminishes water quality and fish and wildlife habitat. This ecosystem standard is intended to restore and maintain water quality by minimizing soil movement in all land management activities.

Although natural disasters may occur, the land manager/user should apply practices to eliminate the potential for mass soil movement to the extent possible.

Possible management practices: Contour Farming, Crop Residue Use, Cross Slope Farming, Divided Slope Farming, Livestock Exclusion, Pasture and Hayland Management, Pasture and Hayland Planting, Range Seeding, Planned Grazing System, Tree Planting, Wildlife Upland Habitat Management.

ECOSYSTEM STANDARD B7: Water Discharge Outlets

DESIRED ECOLOGICAL CONDITION All water discharges are safely disposed of through stable outlets of adequate capacity.

STRATEGY 1. Control surface runoff and discharge water as it returns to waterbodies. 2. Discharge outlets should not contribute to downstream erosion or siltation.

RATIONALE/DISCUSSION Constricted discharge outlets result in increased flow velocity that causes erosion and sedimentation downstream. Increased erosion and sediment decrease water quality and degrade or eliminate fish and wildlife habitat.

This ecosystem standard addresses structural problems related to discharge outlets from surface runoff and irrigation water. This ecosystem standard is intended to ensure that discharge outlets are designed and installed to cause the least impact to fish and wildlife habitat. If there is adequate habitat in the outlet channel it may be desirable to provide passage for both juvenile and adult salmon and trout which often swim up these channels in search of spawning or rearing areas.

Possible management practices: Channel Vegetation, Sediment Basin, Diversion, Filter Strip, Grade Stabilization Structure, Irrigation Systems, Rock Barriers.

ECOSYSTEM STANDARD B8: Surface Water Runoff/Water Discharge Quality

DESIRED ECOLOGICAL CONDITION Surface water runoff, water discharge, and irrigation return flows meet or exceed state water quality standards (WAC 173-201A-030) when entering a stream channel or other surface water.

STRATEGY

1. **Water Discharge and Return Flows.** a) Manage to improve quality of water returning to stream channels and other open water; b) Make sure returning water meets water quality standards (e.g. turbidity, temperature) of water it enters; c) Where feasible, utilize wetland restoration/creation or install sediment basins to serve as a filter for pollutants.
2. **Surface Water Runoff.** Minimize introduction of pollutants into waterbodies by: a) maximizing infiltration, b) retaining and detaining of runoff due to storm and snow melt events, and c) diverting surface runoff from point and other sources.

RATIONALE/DISCUSSION Surface water runoff, water discharge, and return flows that contain animal wastes, fertilizers, sediments, insecticides, herbicides, and elevated water temperatures decrease water quality and degrade or eliminate fish and wildlife habitat. These pollutants can also cause direct fish kills. This ecosystem standard is intended to help restore and maintain water quality by reducing contamination of streams and habitat from return flows, and water discharges, as well as flooding, and storm runoff related to sudden or uncontrolled water discharges.

The ecosystem standard will be met if state water quality standards are met. If the water temperature at a diversion point is already above the standard then it probably will not be improved at the return point, though in this instance, riparian plantings along the irrigation channel might help reduce the temperature. The water quality should be measured just before it returns to the stream and should at least be no worse than at the diversion point. In addition, the land manager/user may choose to "exceed" the regulations, perform additional return flow treatment, and potentially deliver returning water to a stream in better condition than it was received.

Possible management practices: Underground Outlet, Conservation Cropping Sequence, Diversion, Divided Slope Farming, Filter Strips, Sediment Basin.

ECOSYSTEM STANDARD B9: Plant Community Connection

DESIRED ECOLOGICAL CONDITION Plant communities are adequately connected to allow for movement of wildlife between plant communities with minimum exposure to predators or weather.

STRATEGY 1. In rangelands and grazeable woodlands, provide and maintain vegetated connection between the riparian plant community and the natural upland plant community along most of their lengths. 2. In croplands, provide or maintain corridors, which connect riparian and upland communities. 3. Improve road right of ways to maintain connection between riparian and upland areas. 4. Avoid decreasing or eliminating the connection between riparian and upland plant communities when initiating new developments, such as building structures or modifying roads and agricultural fields.

RATIONALE/DISCUSSION Both upland and riparian plant communities provide hiding, resting, breeding and foraging areas, as well as travel corridors for wildlife. In addition, the riparian area provides a source of water. Connection between these plant communities is important to wildlife, particularly to small ground dwelling species, that will not cross wide open areas because of exposure to predators or weather elements.

This ecosystem standard is intended to facilitate wildlife travel between plant communities by having natural plant communities connected along most of their length, if possible. If this is not possible, the alternatives, in priority order, are: connection by strips of native, perennial vegetation; strips of permanent, desirable, perennial non-native vegetation; or at least maintain adjacent natural plant communities and minimize disturbed open ground between them.

The strategies related to roads are included, even though the agency and not the lessee is generally responsible for the placement and modification of roads. Road related strategies are included because of the potential that decisions to build and modify roads will have a negative impact on fish and wildlife.

Possible management practices: Field Border, Field Windbreak, Filter Strip, Grasses and Legumes in Rotation, Wildlife Upland Habitat Management.

ECOSYSTEM STANDARD B10: Small Natural Disturbances

DESIRED ECOLOGICAL CONDITION Small disturbances, including fallen trees (even into surface waters), caused by natural actions, such as fire and wind, are left untreated.

STRATEGY 1. Allow natural regeneration of small natural disturbances to provide necessary habitat diversity for fish and wildlife. 2. Areas of natural disturbance presenting immediate threats to life, property or habitat may be rehabilitated to the extent necessary to diminish threats to an acceptable level. Rehabilitation should be done under an approved plan developed in consultation with state natural resource agencies, land managers/users, and affected tribes. 3. For uplands, "small" means areas of five acres or less which, when disturbed from natural causes, do not interfere with the primary management of the land unit.

RATIONALE/DISCUSSION Small natural disturbances create natural diversity that provide necessary habitat for fish and wildlife. The treatment of small disturbances has contributed to the disappearance of native fish and wildlife by eliminating habitat where it naturally existed. Small areas of naturally caused disturbance support different successional vegetation than most of the surrounding area and increase diversity. The intent of this ecosystem standard is to maintain some natural diversity in upland and riparian habitat and encourage landowners not to clean up after natural occurrences that do not harm the grazing and agricultural use of this land.

Non-interference with small disturbances must be consistent with federal, state, and local laws and regulations (e.g. weed control).

Possible management practices: None required.

ECOSYSTEM STANDARD B11: Native Plant Species

DESIRED ECOLOGICAL CONDITION Native plant species dominate uplands and riparian areas. Non-native plant species, not classed as noxious weeds, which provide habitat benefits to fish and wildlife comparable to native plant species are acceptable.

STRATEGY 1. In uplands (excluding cropland) and riparian areas, maintain existing native vegetation where it exists. 2. Native vegetation should be used for the restoration of damaged sites. 3. Non-native plant species may be used in reclamation provided that equal or greater long-term benefits to fish and wildlife result.

RATIONALE/DISCUSSION Native plant species are an essential part of habitat for native fish and wildlife. The introduction of non-native plant species has contributed to the disappearance of native wildlife by changing the natural biological and structural habitat diversity which the native plants provided. This ecosystem standard is intended to maintain existing native plant species and encourage the use of native plant species in restoration of damaged sites.

The strategy gives land managers the flexibility to use non-native plant species, even if it is feasible to use native plant species, if the non-native species provide equal or greater long-term benefits to fish and wildlife.

Possible management practices: Deferred Grazing, Range Seeding, Planned Grazing System.

ECOSYSTEM STANDARD B12: Limited Habitats

DESIRED ECOLOGICAL CONDITIONS Limited areas, (e.g. oak woodlands, prairies, wetlands, natural seepages), and structural features (e.g., cliffs, caves, snags) that provide benefits to fish and wildlife are preserved and increased (where feasible).

STRATEGY 1) Manage to maintain or increase the acreage of limited habitats which approximate site potential and maintain or increase (in the case of snags) structural features which are important to wildlife and fish. 2) Encourage protection and restoration of limited areas and structured features.

RATIONALE/DISCUSSION WDFW uses the term "limited habitat" when referring to small areas available for species. Limited means small in area as well as occurrence. Land management activities have diminished and eliminated limited habitats (limited areas and structural features) that are critical habitat for nesting, rearing, foraging, and traveling.

This ecosystem standard is intended to result in the maintenance and/or increase the acreage of limited habitat as well the maintenance or increase of existing structural features. This ecosystem standard is not intended to require conversion of existing croplands.

Possible management practices: Range Seeding, Tree Planting, Wildlife Wetland Habitat Management.

ECOSYSTEM STANDARD B13: Streambank Erosion

DESIRED ECOLOGICAL CONDITION Streambank erosion dynamics approximate natural/geologic rates.

STRATEGY 1. No more than ten percent of streambanks are eroded¹ unless it can be determined by watershed and/or stream corridor analysis that the benchmark is unattainable because of natural geologic processes. 2. Stabilize streambanks preferably by maintaining or restoring upland and riparian vegetation consistent with site potential or as addressed by other ecosystem standards. 3. Where bank hardening is desirable or necessary, this shall be accomplished using bioengineering techniques under an approved plan developed in consultation with land managers/users, state natural resource agencies, and affected tribes.

¹ measured as a percentage of the lineal length (measured along both streambanks) of an affected reach of stream. Evaluated stream reach will be a minimum of 2,000 feet in length along each streambank but may be longer to coincide with logical geomorphic reaches.

RATIONALE/DISCUSSION The major cause of streambank erosion is loss of vegetation. As banks erode, the stream channel widens, sediment accumulates, turbidity increases, the water table drops, and fish and wildlife habitat is diminished. Bank erosion can be stopped or reversed by implementing practices which will lead to the establishment of riparian plants with complex root structures that bind soils and protect against the erosive force of water. This ecosystem standard is intended to maintain or restore streambank stability to approximate site potential with a net improvement to water quality and fish and wildlife habitat.

The first strategy provides a measurable benchmark for this standard. Although the 10% may be less than the natural/geologic rate of erosion on some sites, in most cases it indicates a need to examine related management practices. In 1988, the same standard was adopted by the Sawtooth National Forest based on research which tied eroded banks to reduced fish populations in managed and unmanaged watersheds. (12,13,14) The standard is not intended to encourage artificial streambank stabilization.

Possible management practices: Channel Vegetation, Fencing, Fish Stream Improvement, Livestock Exclusion, Streambank and Shoreline Protection, Stream Channel Stabilization. Flood rows.

ECOSYSTEM STANDARD B14A:
Riparian Management Zone (RMZ) - Undeveloped Land

DESIRED ECOLOGICAL CONDITION Vegetation on land adjacent to waterbodies approximates site potential in terms of vigor, composition and other relevant attributes for a distance far enough from the waterbody edge to adequately meet fish and identified wildlife needs.

STRATEGY 1. These conditions will normally be met through implementation of Ecosystem Standards B15 and B21 (Plant Community Status Condition - Riparian and Uplands). This resource is so critical for fish and wildlife that a departure from the desired ecological condition requires a management plan to address this departure and should be a matter of highest priority for land managers. 2. Develop a site specific management plan, which may include RMZ width averaging, to provide an adequate level of protection. In all cases special attention should be given and steps should be taken to address departures within 30 meters (100 feet) of the edge of type 1-4 waters and within 15 meters (50 feet) of type 5 waters (with defined channels). 3. The RMZ may be extended up to 100 meters (325 feet) when necessary to address the needs of a particular identified species or to accommodate channel migration.

RATIONALE/DISCUSSION Riparian areas cover a relatively small portion of the landscape yet support a higher diversity and abundance of fish and wildlife than any other habitat type. Healthy riparian areas provide essential food, cover, water, and space needs for animals, provide important fish and wildlife breeding habitat and seasonal ranges, and offer natural habitat connections and movement corridors across a fragmented landscape. Riparian habitat is essential to healthy aquatic systems and productive fish populations, and enhances the value and utility of upland habitats for wildlife. Riparian functions valuable to people as well as to fish and wildlife include water purification, flood control, aquifer recharge, bank stabilization, recreation, and aesthetics.

This ecosystem standard is intended to keep pollutants from entering waterbodies, and to maintain or restore the fish and wildlife habitat value of riparian areas. It is also intended that activities within the riparian zone be managed at a level or limited to an extent that is compatible with Ecosystem Standard B15: Plant Community Status/Condition - Riparian. This ecosystem standard recognizes that conditions and sizes of riparian areas vary from one site to another along a stream system and over time. The widths included are suggested by current scientific literature. (15,16)

Possible management practices: Channel Vegetation, Deferred and Rotation Grazing, Fencing, Planned Grazing System.

* See Forest Practices Water Types, GLOSSARY.

ECOSYSTEM STANDARD B14B:
Riparian Management Zone (RMZ) - Developed Land

DESIRED ECOLOGICAL CONDITION On developed lands (e.g. cropland) adjacent to waterbodies, management practices will provide soil and streambank stability, shade, filtration, and hydrologic (watershed) function to protect water quality.

STRATEGY 1. While developed lands are exempt from Ecosystem Standard B15, Plant Community Status/Condition - Riparian, steps to assess the current ecological condition will be a matter of highest priority for land managers. Site specific plans will be developed and implemented to address any identified problems. The zone of evaluation will be the same distance from the waters edge as for undeveloped land (B14-A). 2. Opportunities to provide additional fish and wildlife benefits on these lands will be seriously explored. Steps will be taken to provide such additional benefits as feasible and within constraints of existing capital investments. The model for achieving these additional benefits will be the desired ecological condition for undeveloped lands (Ecosystem Standard B14A).

RATIONALE/DISCUSSION See Ecosystem Standard B14A, Rationale/Discussion.

This standard is intended primarily to address non-point source water quality issues. Some secondary fish and wildlife benefits will be realized by achieving the standard. Crop production is allowed within the management zone provided it can be accomplished without degrading water quality.

It is intended to allow agricultural activities that do not damage or prevent the establishment of riparian vegetation adjacent to surface water or contribute pollutants to adjacent surface water including timing of activities. Herbicides may be used to control noxious weeds under certain circumstances. This standard is not intended to discourage water conservation goals.

Possible management practices: Channel Vegetation, Filter Strips, Sod waterways, Water Diversion Terraces.

ECOSYSTEM STANDARD B15:
Plant Community Status/Condition - Riparian

DESIRED ECOLOGICAL CONDITION Within the Riparian Management Zone, the plant community structural complexity, vegetative cover and plant species diversity approximates site potential for native plant species. Non-native plants can be used if they provide equivalent habitat benefits to fish and wildlife.

STRATEGY 1. Manage to maintain or restore the structural complexity, plant species diversity, and cover of the herbaceous and woody vegetative canopy to ensure a fully functional riparian area, including hydrology and vegetation to benefit fish and wildlife.
2. Use native vegetation for restoration, if feasible.

RATIONALE/DISCUSSION Healthy riparian vegetation consists of a complex and diverse mixture of grasses, forbs, shrubs, and trees. In addition to providing fish and wildlife habitat, healthy riparian vegetation reduces pollutants (e.g. sediment, nutrients, and fecal coliform) that may enter surface water. Loss of vegetation leads to reduction in water quality by raising (in summer) or lowering (in winter) stream temperatures, increasing sediment, lowering the water table, and destroying fish habitat. Healthy riparian vegetation traps and filters pollutants that destroy fish habitat.

This ecosystem standard is intended to maintain and restore vegetative structure, cover and plant species diversity important to riparian habitats in the Riparian Management Zone described in Ecosystem Standard B11: Riparian Management Zone.

Possible management practices: Deferred Grazing, Filter Strips, Livestock Exclusion, Planned Grazing System.

ECOSYSTEM STANDARD B16: Stream Channel Sinuosity

DESIRED ECOLOGICAL CONDITION Stream channel meander patterns simulate natural geometry.

STRATEGY 1. Allow channels to maintain meander patterns that simulate natural geometry within defined boundaries (e.g. bridges, roads, existing capital structures, and existing or potential croplands). 2. Maintain or restore riparian vegetation consistent with site potential as defined by other ecosystem standards. 3. Where bank hardening is desirable or necessary, this shall be accomplished using bioengineering techniques under an approved plan developed in consultation with land managers/users, state natural resource agencies and affected tribes. 4. Locate no new capital developments in channel migration zone unless accomplished under an approved plan developed in consultation with land managers/users, state natural resource agencies and affected tribes.

RATIONALE/DISCUSSION Stream channels naturally meander or serpentine in a wavy pattern as a means to lose (or dissipate) energy. When meanders are lost the stream gradient increases, creating faster velocities and more energy. This, in turn, causes the bed of the channel to cut down below its original flood plain. This "incision" results in a lowering of the adjacent water table and replacement of rearing and resting pools with uniform, shallow riffles.

This ecosystem standard is intended to maintain or restore natural stream channel meanders, moderate excessive stream energy, and maintain or increase habitat to meet lifestage requirements of fish.

This ecosystem standard is not intended to encourage in-channel remedial activities or use of a heavy equipment to maintain channel configuration. Implementing practices that will lead to the establishment of healthy upland and riparian areas to site potential and allow the stream to repair itself meets the intent of this ecosystem standard. Where capital development is threatened, artificial means to address sinuosity may be appropriate.

Possible management practices: Channel Vegetation, Deferred Grazing, Fencing, Fish Stream Improvement, Livestock Exclusion, Proper Grazing Use, Streambank and Shoreline Protection, Stream Channel Stabilization.

ECOSYSTEM STANDARD B17: Composite Erosion Rate for Croplands

DESIRED ECOLOGICAL CONDITION The composite erosion rate for sheet and rill, and for wind erosion is "T" or below for the rotation.

Definition: "T" is the amount of topsoil that can be replaced naturally in a year.

Example: When "T" = 5 tons/acre, the allowable soil loss equals the thickness of a dime.

STRATEGY Maintain and improve sustainability of soil resource affected by sheet and rill, and by wind erosion on both dryland and irrigated cropland.

RATIONALE/DISCUSSION Cropland soil erosion is a source of fine sediment which diminishes fish and wildlife habitat by settling in pools and smothering fish eggs and larvae; and by smothering insects that fish and wildlife eat. Insecticides, herbicides, fertilizers, or animal waste contained in agricultural runoff can decrease water quality and degrade or eliminate fish and wildlife habitat. This ecosystem standard is intended to reduce soil erosion loss from agricultural activities and help restore and maintain water quality and fish and wildlife habitat.

"T" is used as an ecosystem standard because it is the best tool available and a level of "T" is attainable under most circumstances. The standard of "T" for crop erosion was developed by SCS and the Agriculture Research Service, U.S. Department of Agriculture; and is used by SCS and Conservation District technicians to develop conservation plans with and for landowners and to evaluate progress toward conservation planning goals. A site specific composite erosion rate is set using the SCS Revised Universal Soil Loss Equation (RUSLE) and the SCS Wind Erosion Equation (WEQ). RUSLE evaluates rainfall, soil erodibility, length and percent of slope, direction across slope, and crop management. WEQ is used to determine site specific wind erosion evaluating climatic factors, wind and direction, erodibility of soil, soil roughness and unsheltered distance.

Possible management practices: Gully prevention and remedial techniques such as brush dams. Conservation Cover, Conservation Cropping Sequence, Conservation Tillage, Critical Area Planting, Crop Residue Use, Grasses and Legumes in Rotation, Irrigation Water Management.

ECOSYSTEM STANDARD B18: Gully Erosion

DESIRED ECOLOGICAL CONDITION Active gully erosion does not occur.

STRATEGY 1. Identify and treat potential and existing ephemeral areas to prevent formation of ephemeral and/or classic gullies. 2. Where classic gullies exist: a) Stop head cutting. b) Stabilize gully side slopes. 3. Land managers/users and state natural resource agencies will need to identify technically sound and economically feasible treatments to stabilize gullies and to reduce the effects of erosion from major storm events that occur more frequently than a 10 year, 24 hour event.

RATIONALE/DISCUSSION Gully erosion resulting from small frequent storm events is a major contributor of sediment entering streams or waterbodies. Ephemeral and classic gully sites contribute more siltation to surface waters than sheet and rill erosion. Erosion from minor storm events can be treated relatively easily and economically. The cumulative impacts of erosion from a number of minor storm events is greater than the impact of a major storm event. A 5 year storm has a 20% chance of occurring in a given year; a 100-year storm has a 1% chance of occurring in a given year and can actually occur repeatedly within a given period of time.

This ecosystem standard is intended to reduce soil erosion from agricultural activities.

Possible management practices: Conservation Tillage, Critical Area Planting, 344 Crop Residue Use, Sediment Basin, Diversion, Grassed Waterway, Livestock Exclusion, Rock Barrier, Terrace. Gully prevention and remedial techniques such as brush dams.

**ECOSYSTEM STANDARD B19:
Water Management for Irrigated Cropland**

DESIRED ECOLOGICAL CONDITION The amount of irrigation water used does not exceed the amount required for the intended crop and land use. (This includes supplemental irrigation, leaching, frost protection, and cooling.)

STRATEGY 1. Match irrigation systems and application methods to crop soil characteristics, terrain (including slopes), and hydrology. 2. Manage to reduce the amount of water diverted and the amount of contaminants to waterbodies through return flows and/or deep percolation.

RATIONALE/DISCUSSION Irrigation diversions and return flows have direct impact on both water quality and quantity available for fish and wildlife in mainstem and tributary streams. Water diverted in excess of the amount required reduces instream flow available for fish. Return flows carrying sediments and other contaminants (pesticides, insecticides, fertilizers, and animal waste) into streams and other waterbodies diminish water quality and eliminate rearing and nesting habitat for fish and insects, which fish and wildlife eat. This ecosystem standard is intended to help restore and maintain fish and wildlife habitat and water quality and quantity by reducing soil erosion from irrigated agricultural activities, reducing excessive use of irrigation water, and helping prevent contaminants from entering surface and ground water.

Irrigation water management is the planned and scheduled application of water to produce a profitable crop. This should be done by applying water efficiently, in a non-erosive manner, and to maintain desired quality of ground and surface waters. Good irrigation water management means using available water resources efficiently and in an appropriate manner. Available water includes water from sources such as irrigation delivery, tail water, rainfall, and ground water. Good irrigation water management requires knowledge of when to irrigate, how much water to apply and how to apply it more effectively and efficiently.

Possible management practices: Irrigation Water Management.

ECOSYSTEM STANDARD B20: Soil Stability and Watershed Function - Uplands

DESIRED ECOLOGICAL CONDITION Soil erosion beyond natural geological rates is not discernible.

STRATEGY 1. Preponderance of evidence from measured soil indicators reflects: (A) "Healthy" conditions as shown in Phase I (Soil Stability and Watershed Function), Table 4-8, Rangeland Health; and (B) "Class 5" conditions as shown in Table 4-1 Rangeland Health. 2. Tables referenced in Strategy #1 may be revised in the future as new technology and information becomes available. The current versions of these Tables are located after Ecosystem Standard B21.

RATIONALE/DISCUSSION Since the majority of a watershed consists of upland areas, rangeland management activities have significant impact on the health of riparian areas and fish and wildlife habitat. This ecosystem standard is intended to result in management activities that lead to a stable soil system that supports stable upland and riparian plant communities and watersheds that allow infiltration of water and slow release to waterbodies.

This standard addresses soil and vegetation issues on rangeland and grazeable woodland using the current trend and technology on inventorying and classifying rangeland condition. This approach replaces traditional methods of assessing rangeland condition.

Discernable soil erosion beyond natural geological rates can be determined by looking at site factors in the Rangeland Health tables. These tables are tools to determine soil stability and watershed function. They also serve as a basic check on the adequacy of vegetative cover. The tables include multiple and measurable indicators divided into 5 classes. It is unreasonable to expect that all indicators will simultaneously fall in the healthiest classes. The standard is met if a preponderance of the indicators (4 out of 5) fall under the "Healthy" category in Table 4-8 and/or Classes 4 and 5 in Table 4-1. This indicates that the soil is stable and the watershed is functioning well (maximum water infiltration and minimum surface flow). If more than two factors, on a given site, fall below these categories, then erosion is presumed to be beyond the natural geologic rate and an evaluation of current vegetative cover and/or site management is required and necessary adjustments made.

Possible management practices: Deferred Grazing, Fencing, Filter Strips, Planned Grazing System.

ECOSYSTEM STANDARD B21:
Plant Community Status/Condition - Uplands

DESIRED ECOLOGICAL CONDITION Upland plant community structural complexity, vegetative cover and plant species diversity approximate site potential for native plant species and/or the equivalent in non-native plants that provide comparable or greater habitat benefits to fish and wildlife.

STRATEGY 1. The desired plant community should consist of primarily perennial grasses and forbs, shrubs, and trees depending on site potential, and contain a minimum of introduced annual forbs, grasses and noxious weeds. 2. Maintain or manage for site factors that are characterized as "Healthy" using the Rangeland Health "Table 4-8, Rangelands Health Evaluation Matrix, Phase 2: Distribution of Nutrient Cycling and Energy Flow", from Rangeland Health. A current version of this Table is located following this standard.

RATIONALE/DISCUSSION The health of rangeland plant communities directly impacts the health of upland wildlife as well as indirectly impacting downslope riparian areas and fish and wildlife habitat by minimizing erosion and contaminants. This ecosystem standard is intended to result in the restoration and maintenance of vegetative structure, vegetative diversity, and herbaceous cover important to upland and riparian fish and wildlife habitats.

Site potential in rangeland plant communities reflects short and long term changes in plant species abundance, composition, and forage production caused by weather changes (e.g. variation in the amount and timing of rainfall.) Soil Conservation Service records indicate high variation in composition and/or forage production (an indicator of the other factors in this standard) based largely on annual or recent precipitation patterns.

The primary evaluation tool for this standard is the Rangeland Health Table 4-8. If measurement of site factors show 4-5 characteristics in the "Healthy," category, then a site would be supporting vegetation that would approximate site potential. This indicates that the plant community is stable or improving condition. If through this evaluation process site factors were in the "At Risk" or "Unhealthy" categories, it would indicate a need to evaluate current management practices. It may be necessary to change activities on vegetation to favor plant development that maintains or encourages desirable perennial plants and benefits wildlife.

Possible management practices: Deferred Grazing, Proper Grazing, Planned Grazing System, Range Seeding.

Table 4-1 Surface Soil Characteristics of BLM

Characteristic	Class 1	Class 2	Class 3	Class 4	Class 5
Soil Movement	Subsoil exposed over much of area; may have embryonic dunes and wind-scoured depressions	Soil and debris deposited against minor obstructions	Moderate movement of soil is visible and recent; slight terracing	Some movement of soil particles	No visual evidence of movement
Surface rock and/or litter	Very little remaining (use care on low-productivity sites); if present, surface rock or fragments exhibit some movement and accumulation of smaller fragments behind obstacles	Extreme movement is apparent; large and numerous deposits against obstacle; if present, surface rock or fragments exhibit some movement and accumulation of smaller fragments behind obstacles	Moderate movement is apparent and fragments are deposited against obstacles; if present, fragments have a poorly developed distribution pattern	May show slight movement; if present, coarse fragments have a truncated appearance or spotty distribution caused by wind or water	Accumulation in place; if present the distribution of fragments shows no movement caused by wind or water
Pedestaling	Most rocks and plants are pedestaled and roots are exposed	Rocks and plants on pedestals are generally evident; plant roots are exposed	Small rock and plant pedestals occurring in flow patterns	Slight pedestaling, in flow patterns	No visual evidence of pedestaling
Flow Patterns	Flow Patterns are numerous and readily noticeable; may have large barren fan deposits	Flow patterns contain silt, sand deposits, and alluvial fans	Well defined, small, and few with intermittent deposits	Deposition of particles may be in evidence	No visual evidence of low patterns
Rills and Gullies	May be present at depths of 8 to 15 cm (3 to 6 inches) and at intervals of less than 13 cm (5 inches); sharply incised gullies cover most of the area, and 50 percent are actively eroding	Rills at depths of 1 to 150 cm (0.5 to 6 inches) occur in exposed areas at intervals of 15 cm (5 feet); gullies are numerous and well developed, with active erosion along 10 to 50 percent of their lengths or a few well-developed gullies with active erosion along more than 50 percent of their length	Rills at depths of 1 to 15 cm (0.5 to 6 inches) occur in exposed places at approximately 300-cm (10-foot) intervals; gullies are well developed, with active erosion along less than 10 percent of their length; some vegetation may be present	Some rills in evidence at infrequent intervals of over 300 cm (10 feet); evidence of gullies that show little bed or slope erosion; some vegetation is present on slopes	No visual evidence of rills; may be present in stable condition; vegetation on channel bed and side slopes

SOURCE: Adapted from Determination of Erosion Condition Class, Form 7310-12, BLM, May 1973, Washington D.C.: U.S. Department of the Interior, from Rangeland Health. (22)

Table 4-8 Rangeland Health Evaluation Matrix

Indicator	Healthy	At Risk	Unhealthy
Phase 1: Soil stability and watershed function			
A-Horizon	Present and distribution unfragmented	Present but fragmented distribution developing	Absent, or present only in association prominent plants or with other obstructions
Pedestaling	No pedestaling of plants or rocks	Pedestals present, but on mature plants only; no roots exposed	Most plants and rocks pedestaled; roots exposed
Rills and gullies	Absent, or with blunted and muted features	Small, embryonic, and not connected into a dendritic pattern	Well defined, actively expanding, dendritic pattern established
Scouring or sheet erosion	No visible scouring or sheet erosion	Patches of bare soil or scours developing	Bare areas and scours well developed and contiguous
Sedimentation or dunes	No visible soil deposition	Soil accumulating around plants or small obstructions	Soil accumulating in large barren deposits or dunes or behind large obstructions
Phase 2: Distribution of nutrient cycling and energy flow			
Distribution of plants	Plants well distributed across site	Plant distribution becoming fragmented	Plants clumped, often in association with prominent individuals; large bare areas between clumps
Litter distribution and incorporation	Uniform across site	Becoming associated with prominent plants or other obstructions	Litter largely absent
Root distribution	Community structure results in rooting throughout the available soil profile	Community structure results in absence of roots from portions of the available soil profile	Community structure results in rooting in only one portion of the available soil profile
Distribution of photosynthesis	Photosynthetic activity occurs throughout the period suitable for plant growth	Most photosynthetic activity occurs during one portion of the period suitable for plant growth	Little or no photosynthetic activity on location during most of the period suitable for plant growth
Phase 3: Recovery mechanisms			
Age-class distribution	Distribution reflects all species	Seedlings and young plants missing	Primarily old or deteriorating plants present
Plant vigor	Plants display normal growth form	Plants developing abnormal growth form	Most plants in abnormal growth form
Germination microsite	Microsites present and distribution across the site	Developing crusts, soil movements, or other factors degrading microsites; developing crusts are fragile	Soil movement or crusting sufficient to inhibit most germination and seedling establishment

SOURCE: Rangeland Health. (22)

ECOSYSTEM STANDARD B22: Water Efficiency

DESIRED ECOLOGICAL CONDITION Improved streamflows to benefit fish and wildlife.

STRATEGY 1. Improve water use efficiency, including conveyance and application methods. 2. Meter and/or measure water use as prescribed by state law. 3. Where practical, move points of diversion from smaller tributaries to larger mainstream streams. 4. Explore use of Trust Water Rights Program to transfer saved water to streams for benefit of fish and wildlife. 5. Explore additional storage systems that are consistent with other ecosystem standards. 6. Protect or enhance natural storage systems, especially in headwaters (e.g., maintain wetlands) and natural channel structure, with surrounding vegetation, to slow rapid runoff.

RATIONALE/DISCUSSION Low water levels and inadequate year round streamflows jeopardize the future of Washington's fish populations. Most streams in the state are already overappropriated. Instream flows established by state regulation under Chapter 173 WAC are junior to previously existing water rights. This ecosystem standard is intended to highlight a desired future condition to benefit fish and wildlife habitat by encouraging land managers/users to conserve water and to donate surplus water to the state Trust Water Rights Program (21) for in-stream use. This ecosystem standard is not intended to affect existing water rights.

While individual land managers/users cannot solve the instream flow problem alone, they can take positive steps to improve streamflows for fish. Washington and other states have already initiated voluntary programs to transfer (temporarily or permanently) saved water back to instream use, without impacting the existing water right holder.

Possible management practices: Irrigated Water Conveyance Ditch and Canal Lining, Pipeline, Irrigation Systems, Irrigation Water Management, Water Conservation.

SECTION C

AQUATIC EVALUATION

STANDARDS

ECOSYSTEM STANDARD C23: Fine Sediment in Spawning Gravel

DESIRED ECOLOGICAL CONDITION Unless it can be determined by watershed and/or stream corridor analysis that the benchmark is unattainable because of natural geological processes, fine sediment less than 0.85 mm (0.0334 inches) is no more than 11% by volume of spawning gravel as measured to a depth of 25 cm (10 inches).

STRATEGY 1. Maintain and improve upland and riparian vegetation consistent with site potential as defined by other ecosystem standards. 2 Identify and control sources of sediment in the watershed that can be controlled by the land manager/user.

RATIONALE/DISCUSSION Fine sediment is a widespread and destructive pollutant that reduces overall survival of fish in various ways. Fine sediments fill the voids between the gravel and cause the following problems: makes spawning difficult or impossible; decreases or eliminates flow of oxygen through the gravel, suffocating fish eggs; eliminates hiding and resting places for juvenile fish (especially important during winter months) and aquatic insects; decreases available space for attachment of algae; decreases bed roughness, which increases flow velocities, so that aquatic insects and young fish cannot maintain positions; fills in resting and rearing pools and decreases bedload movement, a naturally occurring event in healthy streams.

This ecosystem standard applies to spawning gravels, which are typically found in stream reaches where the gradient is less than 3 percent. The standard provides a benchmark that indicates the need to evaluate the impact of management practices in the watershed and/or stream corridor. Peterson et al (17) proposed 11% on the basis that fine sediment in unmanaged watersheds in Washington usually cluster around that value when applied to streams of low and moderate gradient (less than 3%) up to 30 meters (98 feet) wide. Biologically 11% is justified as this is the value under which many fish communities have evolved and adapted. As sediment levels increase, average survival of emergents decreases significantly. The ecosystem standard and sampling method are the same as the Index of Resource Conditions used by Timber/Fish/Wildlife. (18,19) Sediment sampling will be conducted by or in association with state natural resource agencies and affected tribes.

Possible Management Practices: Conservation Cover, Conservation Cropping Sequence, Conservation Tillage, Grassed Waterway, Pasture and Hayland Planting, Range Seeding, Terrace, Water and Sediment Control Basin, Installation of additional road relief culverts, Water bars on heavily stocked trails.

ECOSYSTEM STANDARD C24: Stream Channel Pools

DESIRED ECOLOGICAL CONDITION 50% or more of the summer low flow stream surface area of stream segments with a gradient of 3% or less are made up of pools. Maximum pool area may be more or less than 50% depending on stream potential.

STRATEGY 1. Maintain or restore riparian vegetation consistent with site potential as defined by other ecosystem standards. 2. Where artificial restoration of pools using logs, boulders, etc. is desired, this shall be accomplished under an approved plan developed in consultation with land managers/users, state natural resource agencies, and affected tribes.

RATIONALE/DISCUSSION Pools are critical habitat for many salmonids and a key factor in determining juvenile salmonid abundance. Pools provide refuge for both juvenile and adult fish, especially during low flows. They are areas of reduced velocity which are important as resting areas. Most pools are formed and maintained by trees, logs, and root wads recruited from streambank vegetation. This ecosystem standard addresses a common problem created when streams are channelized to provide more efficient drainage and flood control. Channelization of streams and draining of wetlands lowers water tables, increases water temperatures (due to tree removal), and eliminates resting and rearing habitat for fish.

The intent of this ecosystem standard is not to manage to the 50% level, but to focus treatment and analysis on areas which do not meet or exceed it. This standard is not intended to encourage in-channel remedial activities nor is it intended to imply that 100% pools is the desired future condition. Ideally, affected streams contain clean spawning gravels and a complex mix of high quality pools (1 pool for every 5-7 bank full widths of stream). Implementing practices which will lead to the establishment of healthy upland and riparian areas to site potential and allow the stream to repair itself meets the intent of the standard. Instream boulders/structural remedies may be required to shorten the recovery period, for example in waters listed as 'water quality limited' by DOE or that support endangered fish species.

The 50% standard is proposed by Petersen (17); and used by the DNR Coordinated Monitoring, Evaluation, and Research Committee (CEMR); and the Washington State Forest Practices Board as an evaluation criterion for its Index of Resource Conditions, Watershed Analysis Manual. (19,20) This standard is also consistent with PACFISH proposals. (21)

Possible Management Practices: Filter Strip, Rock Barrier, Planned Grazing System, Tree Planting. Upper Grand Ronde Plan - Umatilla National Forest.

ECOSYSTEM STANDARD C25: Stream Channel Width to Depth Ratio

DESIRED ECOLOGICAL CONDITION Width to depth ratio of streams is 12 to 1 or less¹ to the extent possible given site and stream potential.

¹ Measured as bankfull width divided by average bankfull depth.

STRATEGY 1. Maintain and restore stream channel width to depth ratios to 12:1 or less by maintaining or restoring healthy upland and riparian areas. 2. Reduce sediment delivery to stream channels. 3. Maintain or restore upland and riparian vegetation consistent with site potential as defined by other ecosystem standards.

RATIONALE/DISCUSSION Streams with healthy riparian and upland vegetation naturally tend to be narrower and deeper as width to depth ratios meet or approach stream potential. Healthy streams produce cooler stream temperatures and habitat diversity, e.g. pools. This ecosystem standard is intended to maintain or restore stream channel width to depth ratios to approximately natural levels. The ecosystem standard is best met by implementing practices that will lead to the establishment of healthy riparian areas to site potential, which will allow the stream to repair itself.

Pool formation and maintenance is greatly influenced by hydrology, which is influenced by upland management. Pool frequency is also influenced by both channel width and stream gradient. In some instances, natural and healthy channels may exceed the ratio of 12 to 1 even though the upland and riparian vegetation is developed and fully functioning. Ratios may also vary within a stream system based on seasonal changes, particularly on large spring creeks which lack peak flows sufficient to produce channel features. For this reason, the standard considers site potential. This standard is not intended to cause artificial channel narrowing and therefore sediment sluicing and downstream impacts. A 12 to 1 width to depth may be unnatural for some streams, or may be caused by excess sediment input.

This is the same standard proposed by PACFISH to be applied on streams draining USFS and BLM lands in the Pacific Northwest. (21)

Possible Management Practices: Channel Vegetation, Deferred Grazing, Fencing, Filter Strip, Livestock Exclusion, Pasture and Hayland Management, Proper Grazing Use, Planned Grazing System, Stream Channel Stabilization. USFS FEMAT Riparian Management Requirements. Buffer width recommendations (e.g., critical area ordinances).

GLOSSARY - Acronyms

BLM	- USDI Bureau of Land Management
CRM	- Coordinated Resource Management
DOE	- Washington Department of Ecology
DNR	- Washington Department of Natural Resources
EGEM	- SCS Ephemeral Gully Erosion Model
EPA	- U.S. Environmental Protection Agency
ESA	- Endangered Species Act
ESAC	- HB 1309 Ecosystem Standards Advisory Committee
FEMAT	- Forest Ecosystem Management Assessment Team
FOTG	- SCS Field Office Technical Guide
GMA	- State Growth Management Act
HB1309	- Second Engrossed Substitute House Bill 1309, Sections 5 and 6
HPA	- Hydraulic Project Approval
LWD	- Large woody debris
NLEAP	- SCS Nitrogen Leaching and Economic Analysis Package
NMFS	- National Marine Fisheries Service
NPDES	- National Pollution Discharge Elimination System
NRCS	- USDA Natural Resource Conservation Service (formerly SCS)
PACFISH	- Pacific Fish
PSWQA	- Puget Sound Water Quality Authority
RCW	- Revised Code of Washington
RMZ	- Riparian Management Zone (See Ecosystem Management Standard B11)
RUSLE	- SCS Revised Universal Soil Loss Equation
SCS	- USDA Soil Conservation Service (Now NRCS)
SEPA	- Washington State Environmental Policy Act
TFW	- Timber/Fish/Wildlife
USDA	- U.S. Department of Agriculture
USDI	- U.S. Department of the Interior
USFS	- U.S. Forest Service
USFWS	- U.S. Fish and Wildlife Service
USLE	- SCS Universal Soil Loss Equation
WAC	- Washington Administrative Code
WDF	- Washington Department of Fisheries (now combined with WDW as WDFW)
WDW	- Washington Department of Wildlife (now combined with WDF as WDFW)
WDFW	- Washington Department of Fish and Wildlife
WEQ	- SCS Wind Erosion Equation
WNTC	- SCS West National Technical Center
WRAP	- SCS Pesticide Leaching Model
WRC	- Washington Rangeland Committee
WSCC	- Washington State Conservation Commission

GLOSSARY - Definitions

Defined words are taken or adapted from the sources listed at the end of this section. Source numbers are included in parenthesis after each definition. Numbers of ecosystem standards that include the words are listed after the definitions.

- Adaptive Management** - A process of planning, implementing management practices, monitoring the results of these practices in relation to the plan objectives, and modifying the practices to more closely achieve the objectives; and continuing this cycle of planning, implementing, monitoring, modifying. (24)
- Agricultural Land** - In this report, lands that are intensively used for the production of annual or perennial food and fiber crops and associated land intermixed with the crop production area. (1)
- Anadromous Fish** - Fish species which are born in freshwater, spend a large part of their lives in the ocean, and return to freshwater rivers, streams, and lakes to reproduce. Examples include salmon, sturgeon, shad, smelt, and steelhead. (14,19)
- Anchor Ice** - Ice formed below the surface of a stream or open body of water, on the stream bed or upon a submerged body or structure. (2,3,9) A2
- Aquifer** - A subsurface water-bearing reservoir capable of yielding usable quantities of water to wells and springs. (5,13) B14A
- Bankfull Depth** - The average depth from the bottom of the channel to the ordinary high water mark (bankfull discharge line) as measured at one foot intervals across the channel. (16) C25
- Bankfull Width** - The width of the channel as measured at the ordinary high water mark (bankfull discharge line). (16) C25
- Bank Hardening** - Protection of eroding banklines by placing or dumping heavy stone on them, usually after they have been mechanically sloped back to hold the rock. (18) B13, B16, C25
- Benchmark** - In this report, information or examples for measuring or evaluating achievement of the ecosystem standard. (1) B13, C23
- Bioengineering** - Project design or construction methods which use a combination of live woody vegetation and natural or synthetic materials to establish a complex root grid and structural support within the existing bank which is resistant to erosion, provides bank stability, and maintains a healthy riparian environment with habitat features important to fish and wildlife. (2) B13
- Canopy** - Any plant growth above the ground surface. The overhead branches and leaves of streamside vegetation. (2,9,24) B15

GLOSSARY - Definitions (Continued)

Channel - See Stream Channel.

Channelization - Straightening of a stream or the dredging of a new channel to which the stream is diverted. (2,9) C24

Channel Migration Zone - The area within which a stream channel has meandered or is likely to meander at maximum flow. Also called Channel Meander Belt. (1) C25

Channel Pools - See Stream Channel Pools.

Channel Stability - See Stream Channel Stability.

Community - A grouping of plants and/or animals which have similar habitat requirements or occur under similar site conditions. (24) B9, B15, B21

Conservation - The careful protection, utilization and planned management of resources to prevent their depletion, exploitation, destruction, or waste. (5) B14, B19, B22

Contaminant - A substance such as pesticides, insecticides, fertilizers, animal waste, sediment, that is not naturally present in the environment or is present in amounts that can, in sufficient concentration, adversely affect the environment. (14) B5, B8, B14B, B17, B18, B21, B22, C23

Corridor - See Stream Corridor, Plant Community Connection.

Cover - Generally includes plants or geologic features, which provide fish and wildlife protection from predators and/or weather; or improves adverse conditions of streamflow and/or seasonal changes. May include instream features, water turbulence, and/or vegetation structure, and may be for the purposes of escape, feeding, hiding, or resting areas. (2,9,24) B14A, B15, B17, B20, B21

Critical Habitat - Under the Endangered Species Act, critical habitat is defined as (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the listed species, when it is determined that such areas are essential for the conservation of the species. (7) B12, C24

Deep Percolation - That portion of diverted water applied to a crop which escapes below the root zone. (21) B19

Desired Ecological Condition - (See Guidelines)

Debris Torrents - A swift turbulent flow of an accumulation of loose material arising from the disintegration of rocks and vegetative material. (1) B6

Depth - The vertical distance from the water surface to the stream bed. (1) A2, B21, C23, C25

GLOSSARY - Definitions (Continued)

Detention (of runoff) - The process of collecting and holding back stormwater for delayed release to receiving waters. (12) B8

Discernible - Differences are perceivable, recognizable, clearly visible. To perceive as separate and distinct. (25) B20

Discharge - The rate of flow, or volume of water flowing in a given stream at a given place and within a given period of time, usually expressed as m³/sec. A term used interchangeable with flow. (2,3,9,17,24) B7, B8

Diversion - A temporary or permanent (detour/deviation) removal of surface water flow from a stream channel. (2,9,24) A4, B7, B8, B18, B19, B22

Diversity - The distribution and abundance of different plant and animal species and communities within an area. (1) B10, B11, B14A, B15, B21, C25

Dominate - To exert a major controlling influence on a plant community. (2) B11

Ecosystem - A community of living organisms (plants and animals) interacting with one another and with their physical environment, such as a watershed or other land area. A change in any part of a complex system may affect the whole. (14,24) All Ecosystem Standards

Ecosystem Management - The careful and skillful use of ecological managerial principles to affect ecosystems. This process may produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values, and services over the long-term. (1)

Ecosystem Standard - See GUIDELINES.

Emergent(s) - (a) Very young salmonids which have recently outgrown their larval (alevin) stage and swim up and out of the spawning gravel as free-swimming "fry." (b) Plants that grow above the water surface or often grow on high water table sites next to or near open water. (1,24) C23

Endangered Species - According to the ESA, any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register. (7,19)

Entrapment - The entrapment of fish into the diversion without the presence of a screen, or into high velocity water along the face of an improperly designed screen. (24) A4

Erosion - Wearing away of rock or soil by the gradual detachment of soil or rock fragments by water, wind, ice, and other mechanical and chemical forces. (14) A2, B7, B13, B17, B18, B19, B20, B21

Fecal Coliform - Bacteria present in the intestinal tracts of mammals. High numbers found in a body of water may indicate recent discharges of untreated wastewater or the presence

GLOSSARY - Definitions (Continued)

of animals. These bacteria are indicators that disease causing bacteria or viruses may be present. (12) B15

FEMAT (Forest Ecosystem Assessment Team) - A comprehensive scientific analysis of resource management and conservation issues in the Pacific Northwest established pursuant to President Clinton's April 1993 Forest Conference in Portland, Oregon. FEMAT Option 9 was adopted by President Clinton as a specific management plan for federal timberlands within the range of the northern spotted owl. (8,19) C25

Fertilizer - As defined in Washington law (Chapter 15.54 RCW), a commercial fertilizer is any substance containing one or more recognized plant nutrients (e. g. limes, gypsum, manipulated animal and vegetable manures), is used for its plant nutrient content, and/or is used to promote plant growth. (11) B8, B19, B19

Fish and Wildlife Habitat - The aquatic and terrestrial environment that affords the necessary biological and physical support systems (food, water, shelter, space) arranged on the landscape in such a way that it provides for plant or animal life requirements. (1,2,3,9) B6, B7, B8, B13, B14A, B15, B17, B19, B20, B21, B22, C25,

Flood Plain - Any flat, or nearly flat lowland that borders a stream and is covered by its waters at flood stage. (2,9) B16

Flood Rows - Tree plantings at an angle to the stream channel to intercept silt, slow the water velocity and protect stream banks. (1) B13

Flow - (a) The movement of a stream of water and/or other mobile substances (e.g. oxygen) from place to place. (b) The movement of water, and the moving water itself. (c) The volume of water passing a given point in a given time period. The most commonly used unit is cfs (cubic feet per second). Also called discharge. See Discharge. (2,3,9,17) A2, A4, B7, B8, B19, B20, B21, B22, C23, C24

Low Flow - The lowest stream water discharge recorded over a specified period of time. Also called minimum flow. (3,9) C24

Return Flow - That portion of the water previously diverted from a stream, that is subsequently returned to that stream, or to another body of ground or surface water through discharge, seepage/spills, or deep percolation. (2,9,21) B8, B19

Forb(s) - Broadleaf, herbaceous (non-woody) plant other than those in the grass, sedge or juncus families. Fleshy-leaved herbaceous plant other than grass, especially growing in a field or meadow. (1) B15, B21

GLOSSARY - Definitions (Continued)

Forest Practices Water Types - (From WAC 222-16-030). B14A

Type 1 Water: All waters, within their ordinary high water mark, inventoried as "shorelines of the state" under chapter 90.58 RCW, but not including those waters' associated wetlands as defined in chapter 90.58 RCW. (chapter 90.58.030 2(d) and 2(e) "shorelines of the state.") See Shorelines of the State, this GLOSSARY.

Type 2 Water - Segments of natural waters, and their associated wetlands, not classified as Type 1 Water and having a high fish, wildlife, or human use. (1) Used by substantial numbers of anadromous or resident game fish for spawning, rearing or migration, with stream segments having a defined channel 20 feet or more in width and a gradient of less than 4 percent; lakes, ponds or impoundments having a surface area of 1 acre or greater at seasonal low water. (2) used by salmonids for off-channel habitat that is connected to a salmonid bearing stream and accessible some portion of the year, particularly to juveniles through a drainage with less than a 5 percent gradient.

Type 3 Water: Segments of natural waters, and their associated wetlands, not classified as Type 1 or 2 Water and having a moderate to slight fish, wildlife, and human use. (1) Used by a significant number of anadromous fish for spawning, rearing or migration, with stream segments having a defined channel of 5 feet or greater in width and a gradient of less than 12 percent and not upstream of falls of more than 10 vertical feet; ponds or impoundments having a surface area of less than 1 acres at seasonal low water and having an outlet to an anadromous fish stream. (2) Used by significant numbers of resident game fish; with stream segments having a defined channel of 10 feet or greater in width, a summer low flow greater than 0.3 cubic feet per second, and a gradient of less than 12 percent; ponds or impoundments having a surface area of less than 0.5 acre at seasonal low water.

Type 4 Water - Segments of natural waters not classified as Type 1, 2, or 3 for the purpose of protecting downstream water quality until the channel width becomes less than 2 feet in width; may be perennial or intermittent.

Type 5 Water - All natural waters not classified as Type 1, 2, 3 or 4; includes streams with ~~or without~~ well-defined channels, areas of perennial or intermittent seepage, ponds, natural sinks and drainage ways having short periods of spring or storm runoff. [This report uses the Forest Practices definition except that it does not include streams without well-defined channels.]

Fry - In this report, fry refers to any juvenile salmonid still residing in freshwater. (24) A2

Geomorphic - Of or pertaining to the shape of the earth or its topography. (2) B13

Gradient - See Stream Gradient.

Grazeable Woodland - Forest land on which the understory vegetation includes, as an integral part of the forest plant community, plants that can be grazed without significantly impairing other forest values. (1) B9, B20

GLOSSARY - Definitions (Continued)

Groundwater - Underground water supplies stored in aquifers. Groundwater is created by rain which soaks into the ground and flows down until it is collected at a point where the ground is not permeable. Groundwater then usually flows laterally toward a river, lake, or the ocean. (14) B5

Gully - A channel or ravine cut into the earth by running water during and immediately after heavy rains or the melting of snow. (4) B18

Ephemeral - A cross sectional area under two square feet in size and temporary in nature, usually appearing after a storm event. (1) B22

Habitat - See Fish and Wildlife Habitat, Limited Habitat.

Head Cutting - Downcutting of a stream bed as a result of some destabilizing activity, such as increased water flow velocities or removal of a streambed control such as a large woody debris. (24) B18

Herbaceous - Plants with fleshy stems which often die back to the root crown or are produced from seed each growing seasons. (1) B15, B21

Herbicide - A substance used to destroy or inhibit growth of vegetation. (14) A1, B5, B8, B14B, B17)

Hydraulics - Refers to water or other liquids, in motion and to their action. (2,3,9,24) A3, A4

Hydrology - 1) The scientific study of the properties, distribution, and effects of water in the atmosphere, on the earth's surface, and in soil and rocks. 2) The distribution of water on the surface and underground, and the cycle involving evaporation, precipitation, flow to the seas. (24) B15, B19, C25

Impingement - Struck, hit or dashed upon or against something. (1,24) A4

Impoundment - A body of water formed behind a structure. (1,20) B14A

Incision - Down-cutting of a channel, where the bed of the stream becomes lower, relative to the adjacent flood plain. (16) B16, B21

Infiltration - A soil characteristic determining or describing the rate at which water can enter the soil. (4) B8, B20

Inorganic - Substances not formed by living process. (1) B5

Insecticide - A substance, usually a chemical, that is used to kill insects. (14) B8, B17, B19

GLOSSARY - Definitions (Continued)

- Instream Flow** - Streamflow required to satisfy a mixture of demands being placed on water while it is in the stream. State Law RCW 90.54.020, RCW 90.22.010 lists the following instream uses: maintenance and enhancement of fish and wildlife habitat; recreational purposes; environmental values, including but not limited to scenic, aesthetic, and other values; navigation; water quality, and all other uses compatible with the enjoyment of the public water of the state; and riparian stock drinking. (9) A2, B19, B22
- Intermittent Stream** - See Stream.
- Large Woody Debris (LWD)** - Any large piece of relatively stable woody material having at least a diameter greater than 10 cm (4 inches) and a length greater than 1 meter (3.28 feet) that intrudes into the stream channel. (9,24)
- Leach(ing)** - To pass through. In this report, usually a liquid (such as fertilizer, insecticide, herbicide, animal waste) passing through soil into ground or surface water. (1) B5, B19
- Limited Habitat** - Plant communities, physical and geologic features which support priority wildlife habitat or plant species. Limited habitats are restricted in area of occurrence or location. Examples of limited areas include aspen stands, estuaries, juniper savannah, grasslands, meadows, prairies, steppe, oak woodlands, old-growth/mature forests, riparian, urban and rural natural open spaces, shrub steppe (large blocks), shrub steppe (small blocks), freshwater wetlands, natural seepages, estuaries, kelp beds, and deepwater habitat. Examples of structural features include cliffs, caves, snags, rocky shores, and talus. (1) B12
- Mainstem** - 1. The principal, largest, or dominating stream or channel of any given area or drainage system. 2. The main channel of the river in a river basin, as opposed to the streams and smaller rivers that feed into it. (9,20,24) B19
- Minimum Flow** - See Low Flow.
- Native Plant Species** - Plant species that naturally occur in an area defined by soil, topography and climate; not introduced by human activity. (1) A1, B11, B15, B21
- Natural Regeneration** - Renewal of plant species that depends on natural processes (seed-fall, seed bank in soil or sprouting from roots, rhizomes or dormant crowns) and not on human activities. (1) B10
- Noxious Weed** - Any plant which when established is highly destructive, competitive, or difficult to control by cultural or chemical practices. RCW 17.10.010. (1) A1, B5, B11, B14B, B21
- Nutrient(s)** - Essential chemical needed by plants or animals for growth. (11) B5, B15, B21

GLOSSARY - Definitions (Continued)

Ordinary High Water Mark - The mark on the shores of all waters that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual and so long continued in ordinary years, as to mark upon the soil or vegetation a character distinct from that of the abutting upland: Provided, that in any area where the ordinary high water line cannot be found the ordinary high water line adjoining saltwater shall be the line of mean annual flood and the ordinary high water line adjoining freshwater shall be the line elevation of the mean annual flood. Hydraulic Code, RCW 75.20. (24) B14A

Organic - Of, relating to, or derived from living organisms. Produced by life processes. (1,25) B5

PACFISH - An inter-agency ecosystem management approach for maintaining and restoring healthy, functioning watersheds, riparian areas, and aquatic habitats within the range of Pacific anadromous fish on federal lands managed by BLM and USFS. (7) C24, C25

Perennial - 1. Lasting or active through the year or through many years. 2. Lasting indefinitely; appearing again and again. (25)

Perennial Waterbodies - Continually flowing (e.g. rivers, streams); continual presence of water (ponds, lakes, wetlands). (1) B5

Perennial Plants - Plants living for more than two years. The stems and leaves of a perennial plant die down in the winter and new shoots appear each spring. The term is usually applied to herbaceous plants. (1) B9, B21

Pesticide - As defined by the state Pesticides Control Act, RCW 15.58, any substance or mixture of substances intended to prevent, destroy, control, repel, or mitigate any pest organism (insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus in a living person or other animal). Pesticides include alicides, fungicides, herbicides, insecticides, rodenticides, as well as plant regulators, defoliant, desiccants, and adjuvants (materials added to sprays to enhance their effect). (13,14) B5, B19

Restricted Use Pesticides - Any pesticide which requires additional restrictions to those normally found on the label in order to prevent unreasonable adverse effects on human beings or the environment, including lands, water, beneficial insects, animals, crops and wildlife. Restricted use pesticides can be applied only by licensed applicators or under the direct supervision of a licensed applicator. (11) B5

Plant - An organism of the vegetable kingdom having cellulose cell walls, growing by synthesis of inorganic substances, and lacking the power of locomotion. (25) A1, B5, B9, B11, B13, B14A, B14B, B15, B20, B21

Plant Community - See Community

GLOSSARY - Definitions (Continued)

Plant Community Connection - A network of different plant communities adjacent to each other with no artificial barriers between them and connected to each other as well as to usable habitat outside the plant communities. The linkages serve as travel corridors as well as nesting, resting, breeding, foraging areas for wildlife. Connection can be the entire interface of two or more plant communities or can be limited to a corridor of vegetation that extends from one to the other. (24) B9

Plant Cover - See Cover

Point Source (pollution) - Refers to pollution from a readily identifiable site specific source. (1) B8

Pollutant(s) - A substance at such concentration that it adversely alters the physical, chemical, or biological properties of the environment. The term includes pathogens, toxic metal, carcinogens, oxygen-demanding materials. Pesticides, insecticides, fertilizers, animal wastes, and sediment may be pollutants. See Pollution. (1, 14) B8, B14A, B14B, B15, C23

Pollution - Contamination or other alteration of the physical, chemical, or biological properties, of the environment of the state, including change in temperature, taste, color, or odor, or such discharge of any liquid, gaseous, solid, radioactive or other substance that will or is likely to create a nuisance or render the environment harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life. (13,14,22) B8, B14, B15, C23

Pool(s) - See Stream Channel Pools.

Practices - See GUIDELINES.

Rangeland - Land on which native vegetation is predominately grasses, grass-like plants, forbs, or shrubs. (4) B20, B21

RCW - Revised Code of Washington, laws passed by the Washington state legislature. A1, A3, A4

Reach - See Stream Reach.

Recharge - The infiltration of water from the land surface or from surface waterbodies such as streams or lakes into the subsurface saturated zone. (13) B14A

Reclamation - The return of an ecosystem to a close approximation of its natural condition prior to disturbance. This may include the use of non-native plants. (1) B11

Rehabilitation - The process of (a) making land "productive" again; or (b) improving ecological conditions including soil, vegetation, and watershed function. An alternative ecosystem is created with different structure and function than the original ecosystem. It may include introduced species and require human input to exist. (1) B10

GLOSSARY - Definitions (Continued)

Resident Fish - Fish that spend their entire life cycle in freshwater. (1) A3, A4

Restoration - The return of an ecosystem to a close approximation of its natural condition prior to disturbance. (1) B8, B11, B12, B15, B21, C24

Restricted Use Pesticide - See Pesticide.

Return Flow - See Flow.

Riffle - A shallow rapids where the water flows swiftly over completely or partially submerged obstructions to produce surface agitation, but standing waves are absent. (2,9) B16

Riparian Area - An area next to a drainage or other water which is capable of supporting plant species that requires more moisture than the plant communities growing on adjacent uplands. It is often more diverse in plant and animal species and structural components than uplands and is extremely limited in acreage. Riparian vegetation represents a small percent (1-2) of the total landscape. Wetlands are included as one type of riparian area. (Adopted by ESAC) B5, B6, B9, B11, B14A, B15, B16, B20, B21, C24, C25

Riparian Management Zone (RMZ) - An area that includes the land which supports riparian vegetation and may include some upland, depending on site conditions; adjacent to waterbodies where specific measures are needed to protect fish and wildlife habitat needs and watershed. B14A, B14B, B15

Salmonide - A fish of the family Salmonidae (as distinct from a salmonoid which is merely a fish that resembles a salmon). Fish in this family include salmon and trout, char, whitefish, and grayling. (14,17) C24

Scour - The localized removal of material from the streambed by flowing water. This is the opposite of fill. (9) A1, A2, B21

Sediment/Sedimentation - Fragmental material that originates from weathering of rocks and decomposition of organic material that is transported by, suspended in, and eventually deposited by water or air, and settles to the bottom (e.g. of a liquid, such as the sand and mud). Sedimentation is the depositing or formation of sediment. (1,9,14) B6, B7, B8, B13, B15, B17, B18, B19, B21, B22, C23, C25

Sensitive Species - A category used by WDFW in it's Washington State listing of "Species of Concern" which includes native plant and animal species that are likely to become threatened or endangered if measures are not take to prevent this. WAC 232-12-011

GLOSSARY - Definitions (Continued)

Shorelines of the State - "All of the water areas within the state, including reservoir, and their associated wetlands, together with the lands underlying them; except (i) shorelines on segments of streams upstream of a point where the mean annual flow is twenty cubic feet per second or less and the wetlands associated with such upstream segments; and (ii) shorelines on lakes less than twenty acres in size and wetlands associated with such small lakes. RCW 90.58.030 (B12)

Shorelines of State-Wide Significance - The following shorelines of the state:

- (i) The area between the ordinary high water mark and the western boundary of the state from Cape Disappointment on the south to Cape Flattery on the north, including harbors, bays, estuaries, and inlets;
- (ii) Those areas of Puget Sound and adjacent salt waters and the Strait of Juan de Fuca between the ordinary high water mark and the line of extreme low tide as follows:
 - (A) Nisqually Delta - from DeWolf Bight to Tatsolo Point,
 - (B) Birch Bay - from Point Whitehorn to Birch Point,
 - (C) Hood Canal - from Tala Point to Foulweather Bluff,
 - (D) Skagit Bay and adjacent areas - from Brown Point to Yokeko Point, and
 - (E) Padilla Bay - from March Point to William Point;
- (iii) Those areas of Puget Sound that the Strait of Juan de Fuca and adjacent salt waters north to the Canadian line and lying seaward from the line of extreme low tide;
- (iv) Those lakes, whether natural, artificial, or a combination thereof, with a surface acreage of one thousand acres or more measured at the ordinary high water mark;
- (v) Those natural rivers or segments thereof as follows:
 - (A) Any west of the crest of the Cascade range downstream of a point where the mean annual flow is measured at one thousand cubic feet per second or more;
 - (B) Any east of the crest of the Cascade range downstream of a point where the annual flow is measured at two hundred cubic feet per second or more, or those portions of rivers east of the crest of the Cascade range downstream from the first three hundred square miles of drainage area, whichever is longer;
- (vi) Those wetlands associated with (i), (ii), (iv), and (v) of this subsection (2)(e), Title 90, RCW 90.58.030, Water Rights - Environment.

Silt/Siltation - Silt are particles carried in water which are deposited on the stream bottom. Siltation is the depositing or formation of silt. (12,24) B7, B18

Sinuosity - The amount of bending, winding and curving in a stream or river. (20) B16

Site Potential - See GUIDELINES for ESAC definition. A1, A2, B12, B13, B14A, B15, B16, B21, B22, C23, C24, C25

Site Specific - A specific area or land unit, under management by one entity, with its own unique characteristics, which are considered separately from all others in management planning. (1) B14A, B14B, B17

Snag - (a) A standing dead tree. (b) Sometimes a submerged fallen tree in large streams. The top of the tree is exposed or only slightly submerged. (2) B12

Spawn - (a) To deposit eggs, produce spawn. (b) The eggs of aquatic animals such as bivalve mollusks, fishes, and amphibians. (1) A2, B7, C23, C24

GLOSSARY - Definitions (Continued)

Species - A distinct classification of plants and animals which can sexually reproduce or cross fertilize and which share a common gene pool. (24) A1, B9, B11, B12, B14A, B15, B21, C24

Strategy - See GUIDELINES.

Stream - A natural water course containing flowing water, at least part of the year, supporting a community of plants and animals within the stream channel and the riparian vegetation zone. (2,9) A2, A3, A4, B7, B8, B13, B14A, B14B, B15, B16, B18, B19, B22, C23, C24, C25

Incised Stream - A stream that has, through degradation, cut its channel into the bed of the valley. (2) B16, B21

Intermittent or Seasonal Stream - A stream in contact with the ground water table that flows only at certain times of the year when the ground water table is high and/or when it receives water from springs or from some surface source such as melting snow in mountainous areas. It ceases to flow above the stream bed when losses from evaporation or seepage exceed the available streamflow. (2,9) B5, B14A

Perennial Stream - A stream that flows continuously throughout the year. (2,9) B5, B14A

Streambank - The portion of the channel cross section that restricts lateral movement of water at normal water levels. The bank often has a gradient steeper than 45 degrees and exhibits a distinct break in slope from the stream bottom. An obvious change in substrate may be a reliable delineation of the bank. (1,9) B13, B14, B16, C24

Streambed - The substrate plane, bounded by the stream banks, over which the water column moves. Also called stream bottom. (1,2,9) A2, A3

Stream Channel - An open cut in the earth's surface, either natural or artificial, that periodically or continuously contains moving water. It has a definite bed and banks which serve to confine the water. (1,4,9) B8, B13, B16, C24, C25

Stream Channel Pools - A portion of the stream with reduced current velocity, often with water deeper than the surrounding areas, and which is frequently usable by fish for resting and cover. The conditions or objects that characterizes a pool's formation; include: logs, trees, roots, stumps, brush, debris, channel meanders, sediment, culverts, bridges or other manmade objects, beaver dams or tunnels. (2,9) C24

Stream Channel Stability - A measure of the resistance of a stream to erosion that determines how well a stream will adjust to and recover from changes in flow or sediment transport. (1)

Stream Channel Width to Depth Ratio - See Ecosystem Standard C25: Stream Channel Width to Depth Ratio. B15, C25

GLOSSARY - Definitions (Continued)

Stream Corridor - A stream corridor is usually defined by geomorphic formation, with the corridor occupying the continuous low profile of the valley. The corridor contains a perennial, intermittent, or ephemeral stream and adjacent vegetative fringe. (2,9) B13, C23

Stream Gradient - The general slope, or rate of change in vertical elevation per unit of horizontal distance, of the water surface of a flowing stream. (2,3,9) B16, C25

Stream Reach - A length of stream channel uniform with respect to selected habitat characteristics or elements (discharge, depth, area, slope), fish species composition, water quality, and type and condition of bank cover. (2) B13, C23

Structural Diversity - For fish, this is the formation of numerous feeding, resting and hiding areas as the result of the introduction of large woody debris and rocks in combination with the physical characteristics of the stream channel. For wildlife, this is the occurrence of vegetation at the ground cover, grass/forbs, shrub, and tree levels including all age classes which provides a variety of opportunities for wildlife use, dependent on potential of soil, climate and water. (1,15)

Successional - The process that provides a gradual change in an ecosystem accompanied by changes in species populations that result in a stable, though dynamic, condition. Vegetative change based on site characteristics, climate, and plant competition over time. (1) B10

Summer Low Flow- See Flow.

Surface Water - Water between the ground surface and water table. Under state law, includes lakes, rivers, ponds, streams, inland waters, saltwaters within the jurisdiction of the state of Washington. WAC 173, Water Quality Standards - Surface Water. (22) A2, B8, B10, B14B, B15, B18, B19

T - The soil loss tolerance. It is defined as the maximum amount of erosion at which the quality of a soil as a medium for plant growth can be maintained. This quality of the soil to be maintained is threefold in focus. It includes maintaining (1) the surface soil as a seedbed for plants, (2) the atmosphere-soil interface to allow the entry of air and water into the soil and still protect the underlying soil from wind and water erosion, and (3) the total soil volume as a reservoir for water and plant nutrients, which is preserved by minimizing soil loss. (11) B22

Threatened Species - Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. (19)

Topsoil - The surface layer of soil which often has a high organic material content. (1) B17

Travel Corridor - A route with vegetative characteristics which permits wildlife species to travel to and from foraging, watering, breeding, rearing, and resting areas with minimum exposure to weather elements and/or predators. (1) B9

GLOSSARY - Definitions (Continued)

Tributary - A stream feeding, joining, or flowing into a large stream. (2,9) B19

Trust Water Right - Any water right acquired by the state under RCW 90.42. (19) B22

Turbidity - (a) Relative water clarity. (b) A measure of the extent to which light passing through water is reduced due to suspended materials. (2,9) B8, B13

Underground Aquifer - See Aquifer.

Upland - Upland is used in this report in two ways: (a) ecosystem standards designated as "uplands" apply to rangeland and grazeable woodland, not cropland. (b) otherwise, it refers to land that is above the riparian area including cropland, rangeland, and grazeable woodland. (1) A2, B6, B9, B10, B11, B13, B14A, B20, B21, C23, C24, C25

Vegetative Cover - Percentage of the ground covered when a polygon drawn about the extremities of the undisturbed canopy of each plant is projected upon the ground, and all such projections on a given area are summed.

Velocity - The speed of water flowing in a water-course, such as a river. (20) B7, B16, C24,

WAC - Washington Administrative Code, rules and regulations promulgated and adopted by Washington state agencies. (1) A1, A2, B8, B22

Waterbody(ies) - See Surface Water B5, B7, B8, B14, B14A, B14B, B19, B20,

Water Diversion Device - Pump intakes and gravity water supply structures that divert flow from surface waters. (1) A4

Water Right - A proprietary interest in water for a specified use or uses, in specific quantities, and from a specific source. State law generally provides strong protection to existing rights with respect to any new uses or changes to existing uses regardless of relative priority date. Instream flows adopted by rule are recognized as water rights by state law. Water rights and claims are also recognized which exist under other jurisdictions and authorities: federal projects and tribal water rights and claims, for example. (21) B22

Junior Water Right - A water right that has a lower priority than prior existing water rights and, therefore, may cut off first in a dry season when instream flow is limited. (1) B22

Water Type - See Forest Practices Water Type.

GLOSSARY - Definitions (Continued)

Watershed - The geographic area from which a particular river, stream, or waterbody receives its water supply. The area drains into the particular river, stream, or body of water. A watershed includes hills, lowlands, and the body of water into which the land drains. Watershed boundaries are defined by the ridges which separate drainage areas. Also called catchment area, drainage basin, and basin. (2,9,12,14) A2, B13, B14, B16, B20, B21, C23, C24

Watershed Analysis - A systematic procedure for characterizing watershed and ecological processes which is used to meet specific resource management objectives. Watershed analysis is a stratum of ecosystem management applied to watersheds of approximately 20 to 200 square miles. (1,7) B13, C23

Weed - A plant that has a negative value within a given management system. See Noxious Weed. (1) A1, B5, B10, B11, B14B, B21

Wetlands - Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Habitats where the plant and animal communities have adapted to aquatic or semi-aquatic conditions due to saturated soils during all or part of the year. An area subjected to periodic inundation, usually with soil and vegetative characteristics that separate it from adjoining non-inundated areas. (9,14) B12, B22, C24

Width to Depth Ratio - See Stream Channel Width to Depth Ratio

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21. Environmental Assessment for the Implementation for the Implementation of Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California, USDA, USDI, March 1994.
21. Trust Water Rights Program Guidelines, DOE Publication #92-88.
22. National Soil Survey Handbook, Title 430-VI, Section 618.50, SCS, U.S. Government Printing Office, November 1993
22. Rangeland Health: New Methods to Classify, Inventory, and Monitor Rangelands, Committee on Rangeland Classifications, Board on Agriculture, National Research Council, January 1994.

TABLE 3: TECHNICAL RESOURCE AGENCY INFORMATION

This table identifies agencies that may be able to provide technical assistance to land owners/managers implement practices that address these ecosystem standards. The agencies are listed in alphabetical order by commonly used acronyms.

DOE - WASHINGTON DEPARTMENT OF ECOLOGY

State Office

300 Desmond Dr. Mailing Address
Lacey, WA PO Box 47600
(360) 407-6000 Olympia, WA 98504-7600

Regional Offices

Central Region, Yakima (509) 558-2800
Eastern Region, Spokane (509) 545-2926
Northwest Region, Bellevue (206) 354-7000
Southwest Region, Lacey (360) 407-6300

Technical Resources/Assistance

Water Quality Standards

Stephen Saunders (360) 407-6481

Watershed Planning for Water Quality

David Roberts (360) 407-6414

Trust Water Rights Program

Cynthia Nelson (360) 407-6637

Nonpoint Source Specialists

Max Linden, Central WA

(509) 454-7207

Deborah Cornett, Eastern WA

(509) 456-2877

Stewart Messman, Northwest WA

(360) 649-7070

Michael Templeton, Southwest WA

(360) 407-6295

Other Technical Assistance

Grant preparation and administration

Local government wetland and shoreland protection

Water quality (monitoring, regulations, compliance)

Apply best management practices

Local watershed assessment and planning

DNR - WASHINGTON DEPARTMENT OF NATURAL RESOURCES

State Office

1111 Washington St. SE Mailing Address
Olympia, WA PO Box 47000
(360) 902-1000 Olympia, WA 98504-7000

More Regional Offices

Northwest, Sedro Woolley (206) 856-3500

Southeast, Ellensburg (509) 925-6131

Northeast, Colville (509) 684-7474

Regional Offices

Central, Chehalis (360) 753-3410

Olympic, Forks (360) 374-6131

Southwest, Castle Rock (360) 577-2025

South Puget Sound, Enumclaw (360) 825-1631

Technical Resources/Assistance

Agriculture and Grazing Lands Program - Policy Plan

Other technical guides (e.g. riparian and upland issues, forest stewardship, aquaculture)

Technical staff

TABLE 3: TECHNICAL RESOURCE AGENCY INFORMATION (Continued)

NRCS - NATURAL RESOURCES CONSERVATION SERVICE, USDA

State Office

Rock Pt. Tower, Suite 450
W. 316 Boone Ave.
Spokane, WA 99201-2348
(509) 353-2335, 2336, 2337, 2338

Technical Resources

All Offices

Technical Staff
Planning Assistance
Irrigation Guides

Area Offices

Spokane (509) 353-2364
Ephrata (509) 754-3553
Yakima (509) 575-5865
Olympia (360) 753-9454

All Field Offices

Field Office Technical Guide (FOTG)
NRCS Water Quality Guide

39 Field Offices

Call (509) 353-2335 for addresses and telephone numbers. All offices are co-located with local conservation districts.

WDFW - WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

State Office

111 Washington St. SE Mailing Address
Olympia, WA 600 Capitol Way N.
(360) 902-2200 Olympia, WA 98504-1091

Technical Resources/Assistance

Fish and wildlife habitat
Priority habitats and species
Sensitive, threatened, endangered species
Limited habitats
Culvert and instream structures
Fish passage regulations
Hydraulic Project Approval (HPA)
Water diversion device screening regulations

Regional Offices

Region 1, Spokane (509) 456-4082
Region 2, Ephrata (509) 754-4624
Region 3, Yakima (509) 575-2740
Region 4, Mill Creek (206) 775-1311
Region 5, Vancouver (360) 696-6211
Region 6, Montesano (360) 533-9335

TABLE 3: TECHNICAL RESOURCE AGENCY INFORMATION (Continued)

WSCC - WASHINGTON STATE CONSERVATION COMMISSION

State Office

300 Desmond Dr.
Lacey, WA
(360) 407-6200

Mailing Address
PO Box 47721
Olympia, WA 98504-7721

Technical Resources/Assistance

Guidance in applying conservation best management practices (BMP's)
Conservation technology for irrigation, pesticide application, and stock watering
Design assistance for manure management systems

Area Offices

Central Region, Wenatchee (509) 664-3154
Eastern Region, Pullman (509) 332-3333
Western Region, Lacey (360) 407-6214

WACD Plant Materials Center

Riparian, wetland, and wildlife habitat plant species and trees for conservation and restoration projects. Contact WSCC or local conservation districts.

42 Local Conservation Districts

Call (360) 407-6200 for addresses and phone numbers of district offices.

WSDA - WASHINGTON STATE DEPARTMENT OF AGRICULTURE

State Office

111 Washington St. SE
Olympia, WA
(360) 902-1800

Mailing Address
PO Box 42560
Olympia, WA 98504-2560

Technical Resources/Assistance

Pesticide Management Division
Olympia (360) 902-2010
Plant Services Division
Olympia (360) 902-2077
Noxious Weed Specialist
Yakima (509) 575-2106

WSU - WASHINGTON STATE UNIVERSITY COOPERATIVE EXTENSION

State Office

Hulbert Hall
Washington State University (WSU)
Pullman, WA 99164-6230
(509) 335-2823/2933

Technical Resources/Assistance

Crop and Soil Sciences
(509) 335-2915
Natural Resource Sciences
(509) 335-2963

39 County Extension Offices

Call (509) 335-2933 for the address and phone numbers of office nearest you.

YIN - YAKAMA INDIAN NATION

Central Office

PO Box 151
Toppenish, WA 98948
(509) 865-6262

Technical Resources/Assistance

Fish and wildlife management
Stream rehabilitation
SEPA/NEPA processes
Environmental laws, regulations

EXHIBIT A: HB1309 SECTIONS 1, 5 and 6

SECTION 1 The legislature finds that many wild stocks of salmonids in the state of Washington are in a state of decline. Stocks of salmon on the Columbia and Snake rivers have been listed under the federal endangered species act, and the bull trout has been petitioned for listing. Some scientists believe that numerous other stocks of salmonids in the Pacific Northwest are in decline or possibly extinct. The legislature declares that to lose wild stocks is detrimental to the genetic diversity of the fisheries resource and the economy, and will represent the loss of a vital component of Washington's aquatic ecosystems. The legislature further finds that there is a continuing loss of habitat for fish and wildlife. The legislature declares that steps must be taken in the areas of wildlife and fish habitat management, water conservation, wild salmonoid stock protection, and education to prevent further losses of Washington's fish and wildlife heritage from a number of causes including urban and rural subdivisions, shopping centers, industrial park, and other land use activities.

The legislature finds that the maintenance and restoration of Washington's rangelands and shrub-steppe vegetation is vital to the long-term benefit of the people of the state. The legislature finds that approximately one-fourth of the state is open range or open-canopied grazable woodland. The legislature finds that these lands provide forage for livestock, habitat for wildlife, and innumerable recreational opportunities including hunting, hiking, and fishing.

The legislature finds that the development of coordinated resource management plans, that take into consideration the needs of wildlife, fish, livestock, timber production, water quality protection, and rangeland conservation on all state-owned grazing lands will improve the stewardship of these lands and allow for the increased development and maintenance of fish and wildlife habitat and other multipurpose benefits the public derives from these lands.

The legislature finds that the state currently provides insufficient technical support for coordinated resource management plans to be developed for all state-owned lands and for many of the private lands desiring to develop such plans. As a consequence of this lack of technical assistance, our state grazing lands, including fish and wildlife habitat and other sources provided by these lands, are not achieving their potential. The legislature also finds that with many state lands being intermixed with private grazing lands, development of coordinated resource management plans on state-owned and managed lands provides an opportunity to improve the management and enhance the conditions of adjacent private lands.

A purpose of this act is to establish state grazing lands as a model in the state for the development and implementation of standards that can be used in coordinated resource management plans and to thereby assist the timely development of coordinated resource management plans for all state-owned grazing lands. Every lessee of state lands who wishes to participate in the development and implementation of a coordinated resource management plan shall have an opportunity to do so.

SECTION 5 (1) By December 31, 1993, the department of wildlife and the department of fisheries shall each develop goals for the wildlife and fish that these agencies respectively manage, to preserve, protect, and perpetuate wildlife and fish on shrub steppe habitat or on lands that are presently agricultural lands, rangelands, or grazable woodlands. These goals shall be consistent with the maintenance of a healthy ecosystem.

(2) By July 31, 1993, the conservation commission shall appoint a technical advisory committee to develop standards that achieve the goals developed in subsection (1) of this section. The committee members shall include but not be limited to technical experts representing the following interests: Agriculture, academia, range management, utilities, environmental groups, commercial and recreational fishing interests, the Washington rangelands committee, Indian tribes, the department of wildlife, the department of fisheries, the department of natural resources, the department of ecology,

EXHIBIT A: HB 1309 SECTIONS 1,5, AND 6 (Continued)

conservation districts, and the department of agriculture. A member of the conservation commission shall chair the committee.

(3) By December 31, 1994, the committee shall develop standards to meet the goals developed under subsection (1) of this section. These standards shall not conflict with the recovery of wildlife or fish species that are listed or proposed for listing under the federal endangered species act. These standards shall be utilized to the extent possible in development of coordinated resource management plans to provide a level of management that sustains and perpetuates renewable resources, including fish and wildlife, riparian areas, soil, water, timber, and forage for livestock and wildlife. Furthermore, the standards are recommended for application to model watersheds designated by the Northwest power planning council in conjunction with the conservation commission. The maintenance and restoration of sufficient habitat to preserve, protect, and perpetuate wildlife and fish shall be a major component included in the standards and coordinated resource management plans. Application of standards to privately owned lands is voluntary and may be dependent on funds to provide technical assistance through conservation districts.

(4) The conservation commission shall approve the standards and provide them to the departments of natural resources and wildlife, each of the conservation districts, Washington State University cooperative extension service, and the appropriate committees of the legislature. The conservation districts shall make these standards available to the public and for coordinated resource management planning. Application to private lands is voluntary.

(5) The department of natural resources shall implement practices necessary to meet the standards developed pursuant to this section on department managed agricultural and grazing lands, consistent with the trust mandate of the Washington state Constitution and Title 79 RCW. The standards may be modified on a site specific basis as needed to achieve the fish and wildlife goals, and as determined by the department of fisheries or wildlife, and the department of natural resources. Existing lessees shall be provided an opportunity to participate in any site-specific field review. Department agricultural and grazing leases issued after December 31, 1994, shall be subject to practices to achieve the standards that meet those developed pursuant to this section.

SECTION 6 The department of wildlife shall implement practices necessary to meet the standards developed under section 5 of this act on agency-owned and managed agricultural and grazing lands. The standards may be modified on a site-specific basis as necessary and as determined by the department of fisheries or wildlife, for species that these agencies respectively manage, to achieve the goal established under section 5(1) of this act. Existing lessees shall be provided an opportunity to participate in any site-specific field review. Department agricultural and grazing leases issued after December 31, 1994, shall be subject to practices to achieve the standards that meet those developed pursuant to section 5 of this act.

This section shall in no way prevent the department of wildlife from managing its lands to accomplish its statutory mandate pursuant to RCW 77.12.010, nor shall it prevent the department from managing its lands according to the provisions of RCW 77.12.210 or rules adopted pursuant to this chapter.

Washington Laws, 1993 1st Special Session, Chapter 4, Sections 1, 5, 6

EXHIBIT B: WDFW SUB-GOALS FOR HB1309, SECTION 5

Sub-Goals for Aquatics Resources:

1. Restore and maintain water quality, including but not limited to temperature, dissolved oxygen, turbidity, fine sediment levels, nutrient levels, within natural historical levels. (A2, B5, B6, B7, B8, B13, B14, B15, B16, B18, B20, B21, B22, C23, C24, C25, D23)
2. Restore and maintain minimum instream flows to maximize aquatic resource productivity. (B14, B15, B19, B22)
3. Restore and maintain stream morphology and instream habitat structure, including but not limited to pool-to-riffle ratios, large organic/woody debris where historically available, spawning and rearing habitat availability, channel width and depth, side channels, and streambed and streambank stability. (B6, B7, B13, B14, B15, B16, B20, B21, C23, C24, C25, B22)
4. Provide for upstream and downstream fish passage for all anadromous and resident stocks. (A2, A19, B16, B22, C24, C25)
5. Prevent contaminants (pesticides, herbicides) and nutrients (animal wastes, fertilizers) from entering streams. (B5, B8, B14, B15, B18, B19, B22)
6. Ensure that water diversions are properly metered and screened to prevent stranding and loss of resident and migratory fish. (A4)
7. Control and prevent the introduction of undesirable exotic flora and fauna that will compete with Washington's native and desirable non-native fish, shellfish, and wildlife species. (A1, B11, B14, B15, B20, B21, C24)
8. Restore degraded riparian habitat and enhance other habitat to maximize the productive capacity of the habitat for aquatic resources. (A2, B11, B13, B14, B15, B16, B20, B21, C25)
9. Establish quantitative management objectives and strategies or standards for the maintenance, enhancement and restoration of riparian habitat. (B15)
10. Complete accurate inventories of streams and riparian zones to determine location, condition (water quality and quantity, and stream morphology and channel structure), and potential for recovery.
11. Educate and increase awareness of local jurisdictions, land managers and users of the interrelationship between upland areas within a watershed, water and riparian habitat.
12. Inform local jurisdictions, land managers and users of the need to maintain, enhance and restore both upland and riparian habitat for the protection of aquatic resources.
13. Restrict harvest of depressed, critical, threatened, and endangered species.

EXHIBIT B: WDFW SUB-GOALS FOR HB1309, SECTION 5 (Continued)

Sub-Goals For Terrestrial Resources

1. Maintain or restore the abundance and distribution of native habitat types. These are both vegetative, e.g., oak woodlands, riparian, prairies, steppe; and structural habitats, e.g., cliffs, snags, caves. (A1, B5, B11, B13, B14, B15, B16, B20, B21, C23, C24 C25)
2. Maintain or restore the vegetation structure and function of native habitat types within site potentials. (B13, B14, B15, B20, B21, C23)
3. Maintain or restore vegetation communities to support habitat diversity and a wide range of wildlife species, with an emphasis on large areas, i.e., those with a high area to edge ratio, and those which support priority species.
4. Maintain or restore habitat connectivity between naturally vegetated areas to ensure wildlife accessibility to all habitat features. (B9, B14, B20, B21)
5. Maintain or restore riparian zones to site capabilities; with particular attention to those which provide connections with other vegetative types. (B13, B14, B15, B16, B20, B21, C23, C24, C25)
6. Minimize habitat conversion and wildlife disturbance during critical periods, e.g., breeding, rearing young, winter. (B14, B15, B20, B21)
7. Maximize soil stabilization in all activities. (B6, B7, B8, B13, B14, B15, B18, B19, B20, B21, C23)
8. Minimize or eliminate contaminants entering wildlife habitat, e.g., pesticides, herbicides, industrial waste. (B5, B6, B8, B13, B14, B15, B18, B19, B20, B21, B22, C23)
9. Prevent and control undesirable exotic flora and fauna. (A1, B11, B15, B21)
10. Educate and increase awareness of local jurisdictions, land managers and users of the interrelationships between vegetation communities and their structure, diversity and abundance, land features and water within a geographical area, to the maintenance of wildlife species diversity and naturally producing wildlife populations.

EXHIBIT C: CONSERVATION COMMISSION SELECTION CRITERIA

*Ratified by the HB1309 Ecosystem Standards
Advisory Committee on October 6, 1993*

1. HB 1309 requirement that committee members shall include but not be limited to technical experts representing the following interests, organizations, and agencies.

**Academic
Agriculture
Commercial and Recreational Fishing
Environmental Groups
Indian Tribes
Range Management
Utilities**

**Washington Rangelands Committee
Conservation Districts
Department of Agriculture
Department of Ecology
Department of Fisheries
Department of Natural Resources
Department of Wildlife**

2. Maximum Number of Committee Members:
Desirable: 16 - 20
Absolute: 24
3. Includes a balanced representation of technical, theoretical, political, and practical expertise and experience.
4. Includes stakeholders, customers, partners in carrying out HB 1309 tasks.
5. Includes organizations and groups who could oppose or undo results.
6. Members representing groups and organizations:
 - A. Are nominated and endorsed by Executive Committee or Board
 - B. Have clear authority to represent organization, group, or coalition
 - C. Are known and respected leaders in the group or organization
7. Committee appointed by the Commission is subject to ratification by the Technical Advisory Committee at it's first meeting.

EXHIBIT D: GROUND RULES

*Adopted by the HB1309 Ecosystem Standards Advisory Committee
November 22, 1993, Revised March 28, 1994 and June 7, 1994*

1. We agree to focus our discussions on the legislative assignment under HB1309 to develop ecosystem standards and avoid debating issues and concerns beyond the scope of the assignment or control of the group.
2. We represent a broad range of interests, each having concerns about the outcome of the issue at hand. All parties recognize the legitimacy of the interests and concerns of others, and expect that their interests will be respected as well.
3. We commit to listening carefully to each other, to recognizing each person's concerns and feelings about the topic, to asking questions for clarification and to making statements that attempt to educate or explain.
4. Each of us takes responsibility for getting our individual needs met, and we also agree that all HB1309 issues identified by any member must be addressed by the group. We commit to keeping our colleagues and constituents informed about the progress of these discussions, and to doing so in a timely manner.
5. We commit to no personal attacks directed at individuals and/or agencies.
6. We will attempt to use a consensus decision making process. We define consensus as a decision that allows every member to say "I can live with the decision and accept it, even though it may or may not be exactly what I want." Consensus decisions will be reported in minutes distributed. ESAC members may express concerns and provide additional input within 2 weeks after the minutes are distributed and the issue will be put on the agenda for reconsideration at the next ESAC meeting.

If we are unable to reach consensus, we will consider other options including, but not limited to:

- a) leaving the issue unresolved;
- b) referring the issue to an ad hoc committee to identify options and recommend an action for the committee to consider;
- c) taking an advisory or "straw" vote to help the committee to decide what action to take next; or
- d) presenting a minority report with the standards report.

This list is not in priority order.

7. We are committed to developing standards responsive to the weight of evidence presented.

EXHIBIT D: GROUND RULES (Continued)

8. We agree that to get maximum benefit from the committee, a climate that encourages candid and open discussion should be created. In order to create and sustain this climate, we commit to not attributing suggestions, comments or ideas of another participant to the news media or non-participants. We agree that all communications with the news media will be by periodic, approved press releases only. Commission staff will draft press releases for committee review.
9. We agree that interested observers may attend meetings. Written comments are welcome and will be shared with and considered by the committee.
10. We will foster open discussion of issues, and in order to do this, we will respect each other's right to disagree.
11. We agree that this effort is a priority in terms of time and/or resource commitment. Each participant may provide the name of an alternate. The alternate would attend in the absence of the participant. It is the responsibility of the member and alternate to keep each other up to date.
12. We agree that anyone may leave this process and request that he/she tell the entire group why to see if the problem(s) can be addressed by the group.
13. In the event this effort is unsuccessful, we recognize that a participants is free to pursue her/his interests in other forums without prejudice.
14. We agree to the need for keeping meeting minutes. Minutes should not affiliate comments/statements to individuals and need not be verbatim restatements of meetings. They need only reflect decisions made.
15. We are encouraged to seek advice and information from others outside the group.
16. We will be advocates for the process and the standards developed.

EXHIBIT E: COMMITTEE GOAL STATEMENT

*Adopted by the HB1309 Ecosystem Standards Committee January 18, 1994
and Revised March 28, 1994*

Purpose The purpose of the committee is to carry out the legislative assignment to develop standards that will result in practices on state owned agricultural lands, rangelands and grazeable woodlands to benefit fish and wildlife habitat. Application of standards will be voluntary on private lands.

Goals Set by Legislature The 1993 legislation passed as House Bill 1309 sets the primary goal for the HB1309 Ecosystem Standards Advisory Committee as: **the committee shall develop standards to meet the [wildlife and fish] goals developed [by the department of wildlife and the department of fisheries]** . The committee was established by the 1993 legislature to carry out certain tasks under the guidance of the Washington State Conservation Commission. See HB 1309 Sections 1 and 6 (EXHIBIT A) and the sub-goals developed by the Departments of Fisheries and Wildlife in response to HB1309 Section 5(1). See EXHIBIT B. The standards developed by the committee will be implemented with practices included in state agricultural and grazing land leases and permits consistent with the trust mandate of the Washington state Constitution and Title 79 RCW, on DNR lands. The standards may be modified on a site specific basis as necessary and as determined by the department of fisheries or wildlife, for species that these agencies respectively manage, or as determined by the department of natural resources on department managed agriculture and grazing lands. Conservation districts will make these standards available to the public and for coordinated resource management planning.

Criteria Adopted by the Committee By design the committee is made up of twenty five representatives of farming, ranching, utilities, tribal, conservation, and environmental organizations, and affected agencies. Each committee member represents a different constituency and different opinions, priorities, interests, and values. Committee ground rules recognize the legitimacy of and respect for the interests and concerns of other members and the right to disagree. Using a consensus decision making process, the committee has adopted the following criteria as guidelines for the development of standards. The criteria are not weighted or listed in priority order.

The committee will work to develop standards that are:

1. Consistent with the maintenance and restoration of sufficient habitat to preserve, protect, and perpetuate wildlife and fish;
2. Consistent and compatible with state and federal laws, rules, and regulations;
3. Clear and understandable.
4. Based on scientifically valid information;
5. Measurable so that their effectiveness in terms of benefits to salmonids and other fish and wildlife can be evaluated.;

EXHIBIT E: COMMITTEE GOAL STATEMENT (Continued)

Costs and Benefits The short and long term costs and benefits of a proposed standard will be considered.

Further Recommendations The ESAC committee is developing a list of further concerns and recommendations that they will discuss and address at some point, perhaps in the final report to the legislature. These issues will be included in the list:

1. The need to modify standards over time vs. the need for certainty on the part of the landowner.
2. Should standards be reviewed on a regular basis? Every five years? By what mechanism and by whom?
3. Should practices be supported by incentives to acknowledge innovative and successful landowners or by funding to support the costs of implementation (i.e., cost sharing programs)?
4. How can legal obstacles to implementing practices be addressed?