AMENDATORY SECTION (Amending WSR 06-11-112, filed 5/18/06, effective 6/18/06)

WAC 222-24-010 Policy. *(1) A well designed, located, constructed, and maintained system of forest roads is essential to forest management and protection of the public resources. Riparian areas contain some of the more productive conditions for growing timber, are heavily used by wildlife and provide essential habitat for fish and wildlife and essential functions in the protection of water quality. Wetland areas serve several significant functions in addition to timber production: Providing fish and wildlife habitat, protecting water quality, moderating and preserving water quantity. Wetlands may also contain unique or rare ecological systems.

*(2) To protect water quality and riparian habitat, roads must be constructed and maintained in a manner that will prevent potential or actual damage to public resources. This will be accomplished by constructing and maintaining roads so as not to result in the delivery of sediment and surface water to any typed water in amounts, at times or by means, that preclude achieving desired fish habitat and water quality by:

- Providing for free and unimpeded passage for fish ((~~passage~~)) at all life stages ((~~(see Washington state department of fish and wildlife hydraulic code Title 220 WAC)~~));
- Preventing mass wasting;
- Limiting delivery of sediment and surface runoff to all typed waters;
- Avoiding capture and redirection of surface or groundwater. This includes retaining streams in their natural drainages and routing subsurface flow captured by roads and road ditches back onto the forest floor;
- Diverting most road runoff to the forest floor;
- ((~~Providing for the passage of~~)) Designing water crossing structures to the 100-year flood level to provide for the passage of bedload and some woody debris;
- Protecting stream bank stability, the existing stream channel, and riparian vegetation;
- Minimizing the construction of new roads; and
- Assuring no-net-loss of wetland function; and
- Assuring no-net-loss of fish habitat.

The rules for road construction and maintenance ((~~rules in this chapter~~)) and forest practices hydraulic projects must be applied in achieving these goals. Additional guidance is identified in board manual sections 3 and 5. If these goals are not achieved using the rules and the applied guidance, additional management strategies must be employed.

*(3) Extra protection is required during road construction and maintenance and for forest practices hydraulic projects to protect

public resources and timber growing potential. Landowners and fisheries and wildlife managers are encouraged to cooperate in the development of road management and abandonment plans. Landowners are further encouraged to cooperate in sharing roads to minimize road mileage and avoid duplicative road construction.

*(4) This section covers the location, design, construction, maintenance and abandonment of forest roads, bridges, stream crossings, quarries, borrow pits, and disposal sites used for forest road construction and is intended to assist landowners in proper road planning, construction and maintenance so as to protect public resources.

(Note: Other laws and rules and/or permit requirements may apply. See chapter 222-50 WAC.)

AMENDATORY SECTION (Amending WSR 01-12-042, filed 5/30/01, effective 7/1/01)

WAC 222-24-020 Road location and design. (1) **Fit the** road to the topography so that a minimum of alterations to the natural features will occur.

*(2) Except for crossings, new stream-adjacent parallel roads shall not be located within natural drainage channels, channel migration zones, sensitive sites, equipment limitation zones, and riparian management zones when there would be substantial loss or damage to fish or wildlife habitat unless the department has determined that other alternatives will cause greater damage to public resources. Proposals with new stream-adjacent parallel roads will require an on-site review by an interdisciplinary team. The appropriate federal representative(s) will be invited to attend the interdisciplinary team to determine if the proposal is in compliance with the Endangered Species Act.

*(3) Roads shall not be constructed in bogs or low nutrient fens.

*(4) Roads shall not be located in wetlands if there would be substantial loss or damage to wetland functions or acreage, unless the department has determined that alternatives will cause greater damage to public resources.

*(5) Minimize the number of stream crossings.

*(6) Where stream crossings are necessary:

(a) Design stream crossings to minimize alterations to natural features;

(b) Locate and design culverts to minimize sediment delivery; ((~~and~~))

(c) Whenever practical, cross streams at right angles to the main channel; and

(d) Design stream crossings in Type S and F Waters to provide free and unimpeded passage for fish at all life stages.

*(7) Avoid duplicative roads by keeping the total amount of

construction to a minimum. Use existing roads whenever practical and avoid isolating patches of timber which, when removed, may require unnecessary road construction.

*(8) All new road construction on side slopes that exceed ((~~60~~)) sixty percent, which have the potential to deliver sediment to any typed water or wetland must utilize full bench construction techniques, including end hauling, over hauling or other special techniques. The department may waive the full bench construction requirement if a site review is conducted and the absence of delivery potential to any typed water or wetlands is determined.

(9) Use the minimum design standard that produces a road sufficient to carry the anticipated traffic load with reasonable safety.

*(10) Subgrade width should average not more than ((~~32~~)) thirty-two feet for double lane roads and ((~~20~~)) twenty feet for single lane roads, exclusive of ditches, plus any additional width necessary for safe operations on curves and turnouts. Where road location in wetlands is unavoidable (see WAC 222-24-015 (1)(b)), minimize subgrade width.

(11) Balance excavation and embankments so that as much of the excavated material as is practical will be deposited in the roadway fill sections. Where full bench construction is necessary, design suitable embankments so that the excavated material may be end hauled to appropriate deposit areas.

(12) Cut and fill slopes must be designed and constructed in a manner that will assure a high likelihood of remaining stable throughout the life of the road.

*(13) All roads shall be outsloped or ditched on the uphill side and appropriate surface drainage shall be provided by the use of adequate drainage structures such as: Cross drains, ditches, drivable dips, relief culverts, water bars, diversion ditches, or other such structures demonstrated to be equally effective.

*(14) Drainage structures shall not discharge onto erodible soils, or over fill slopes unless adequate outfall protection is provided.

*(15) Relief culverts installed on forest roads shall meet the following minimum specifications: (See ((~~the~~)) board manual((~~,~~)) section 3 for culvert spacing.)

(a) Be at least ((~~18~~)) eighteen inches in diameter or equivalent in western Washington and ((~~15~~)) fifteen inches in diameter or equivalent in eastern Washington.

(b) Be installed in a manner that efficiently captures ditchline flow and passes it to the outside of the road.

*(16) Ditch diversion. Where roadside ditches slope toward any typed water, or Type A or B Wetland, a ditch relief structure must be located as close to the stream crossing or wetland as possible so it drains off before reaching the stream. On stream-adjacent parallel roads, relief culverts shall be located at maximum distances from stream channels to minimize sediment delivery. The relief structure must allow the sediment to be deposited onto the forest floor and not carry surface water or sediment into the stream channel or wetland.

*(17) Outslope the road surface where practical. Where

outsloping is not practical, provide a ditch with drainage structure on the inside of the road, except where roads are constructed in rock or other materials not readily susceptible to erosion.

*(18) Crown or slope the road to prevent the accumulation of water on the road surface.

*(19) Install rock armor headwall inlets on all stream-crossing culverts where the stream gradient above the crossing is greater than ((~~6~~)) six percent.

*(20) Install rock armored headwalls and rock armored ditchblocks for drainage structure culverts located on erodible soils or where the affected road has a gradient greater than ((~~6~~)) six percent.

*(21) Install drainage structures at locations where seeps and springs are known or discovered during construction to route accumulated surface water across the road prism. The water from the seeps and springs must be returned to the forest floor as close to the point of origin as reasonably practicable.

*(22) In addition to information required for a complete application, the department may require ((~~additional~~)) more detailed information for proposed road construction ((~~as part of a complete application~~)), including:

(a) A map with detailed topographic information showing the location and alignment of the road in relation to all typed water and wetlands as required in WAC 222-16-035;

(b) Location, size, alignment and number of water crossing and drainage structures;

(c) Detailed plans for bridges, ((~~large~~)) culverts or other complex elements of the proposal; and

(d) Other information identified by the department.

NEW SECTION

WAC 222-24-038 Preapplication consultation and road-related forest practices hydraulic projects. Landowners contemplating forest practices hydraulic projects related to road construction and maintenance are encouraged to consult with the department and the department of fish and wildlife prior to submitting an application to help ensure that project plans and specifications meet fish protection standards.

AMENDATORY SECTION (Amending WSR 01-12-042, filed 5/30/01, effective 7/1/01)

WAC 222-24-040 *Water crossing structures for all typed waters. ((~~*(1) **General provisions for all typed waters.**~~

~~In addition to the applicable general provisions below, installation, maintenance and removal of water crossing structures in or across the bankfull width of Type S or F Waters are subject to hydraulic code rules, chapter 220-110 WAC, and require hydraulic project approval (HPA) issued by the department of fish and wildlife. HPAs may be required on Type Ns and Np Waters.~~

~~(a)~~)) (1) Bridges are required for new crossings and reconstructed crossings of any typed waters regularly used for recreational boating.

((~~(b)~~)) (2) Structures containing concrete must be sufficiently cured prior to contact with water.

((~~(c)~~)) (3) One end of each new or reconstructed permanent log or wood bridge shall be tied or firmly anchored if any of the bridge structure is within ((~~10~~)) ten vertical feet of the 100-year flood level.

((~~(d)~~)) (4) Alterations or disturbance of the stream bed, bank or bank vegetation must be limited to that necessary to construct the project. All disturbed areas must be stabilized and restored according to the recommended schedule and procedures found in ((~~section 3 of the~~)) board manual section 5. This requirement may be modified or waived by the department, in consultation with the department of fish and wildlife, if precluded by engineering or safety factors.

((~~(e)~~)) (5) When earthen materials are used for bridge surfacing, only clean sorted gravel may be used, a geotextile lining must be installed and curbs of sufficient size shall be installed to a height above the surface material to prevent surface material from falling into the stream bed.

((~~(f)~~)) (6) Wood removed from the upstream end of culverts and bridges will be placed at the downstream end of such culverts and bridges in such a way as to minimize obstruction of fish passage and to the extent practical, while avoiding significant disturbance of sediment((~~,~~)) in connection with maintenance activities.

((~~*(2) **Bridges over Type Np and Ns Waters.** In addition to the applicable general provisions above, installation, maintenance, and removal of permanent bridges in or across Type Np and Ns Waters are subject to the following:~~

~~(a) Permanent bridges must not constrict clearly defined channels and must be designed and installed to pass the 100-year flood. The bridge and its associated embankments and fills must provide sufficient erosion protection to withstand a 100-year flood event.~~

~~(b) Excavation for and placement of the bridge foundation and superstructure must be located and conducted from outside the outer edge of the bankfull width. This requirement may be waived by the department, in consultation with the department of fish and wildlife, if it can be demonstrated that these activities may be~~

~~conducted in such a manner to prevent damage to public resources.~~

~~(c) Earthen embankments constructed for use as bridge approaches must be provided with sufficient erosion protection to withstand a 100-year flood event.~~

~~*(3)~~ ~~**Culvert installation for Type Np and Ns Waters.**~~ ~~In addition to applicable general provisions above, installation, maintenance and removal of permanent culverts in or across Type Np and Ns Waters are subject to the following provisions:~~

~~(a) All permanent culverts must be designed to pass the 100-year flood event with consideration for the passage of debris likely to be encountered.~~

~~(b) The culvert and its associated embankments and fills must have sufficient erosion protection to withstand the 100-year flood event. Erosion protection may include armored overflows or the use of clean coarse fill material.~~

~~(c) If the department determines that because of unstable slopes the culvert size shown in the board manual, section 3, "Determining Culvert Size, Method A" would be inadequate to protect public resources, it may require a larger culvert designed using generally accepted engineering principles that meet the standards in (a) and (b) of this subsection.~~

~~(d) No permanent culverts shall be installed that are smaller than:~~

~~(i) 24 inches for Type Np Waters.~~

~~(ii) 18 inches for Type Ns Waters in western Washington.~~

~~(iii) 15 inches for Type Ns Waters in eastern Washington.~~

~~(e) The alignment and slope of the culvert shall parallel the natural flow of the stream whenever possible.~~

~~(f) Culverts must be designed and installed so they will not cause scouring of the stream bed and erosion of the banks in the vicinity of the project.~~

~~(g) When the department determines that installing a culvert in a flowing stream will result in excessive siltation and turbidity, and siltation and turbidity would be reduced if stream flow were diverted, the department shall require the stream flow be diverted using a bypass flume or culvert, or by pumping the stream flow around the work area. This may include culvert installations that are within 0.25 miles of a Type S or F Water or within two miles of a hatchery intake in consultation with the department of fish and wildlife.~~

~~(h) Fill associated with culvert installation must have sufficient erosion protection to withstand the 100-year flood.~~

~~(i) Stream beds shall be cleared for a distance of 50 feet upstream from the culvert inlet of such slash or debris that reasonably may be expected to plug the culvert.~~

~~(j) The entrance of all culverts shall have adequate catch basins and headwalls to minimize the possibility of erosion or fill failure.~~

~~*(4)~~ ~~**Temporary water crossings in Type Np and Ns Waters.**~~ ~~In addition to the applicable general provisions above, installation, maintenance and removal of temporary bridges or other structures in or across Type Np and Ns Waters are subject to the following:~~

~~(a) A temporary water crossing is intended for use during the life of an approved application/notification.~~

~~(b) It must be constructed to facilitate abandonment when the intended use is complete or upon seasonal shutdown, whichever is sooner.~~

~~(c) Temporary water crossings must be identified on the forest practices application or notification, along with an abandonment date.~~

~~(d) Temporary water crossings may be used:~~

~~(i) In western Washington if installed after June 1 and removed by September 30 of the same year.~~

~~(ii) In eastern Washington if installed after the spring runoff and removed prior to October 15th.~~

~~(iii) At other times, when the department and applicant can agree to specific dates of installation and removal and the extended dates result in equivalent levels of resource protection.~~

~~(e) Temporary water crossings must be designed to pass the highest peak flow event expected to occur during the length of its intended use.~~

~~(f) When the department determines that installing a culvert in a flowing stream will result in excessive siltation and turbidity, and siltation and turbidity would be reduced if stream flow were diverted, the department shall require the stream flow be diverted using a bypass flume or culvert, or by pumping the stream flow around the work area. This may include culvert installations that are within 0.25 miles of a Type S or F Water or within two miles of a hatchery intake, in consultation with the department of fish and wildlife.~~

~~(g) Temporary water crossings shall be promptly removed and abandoned to the specifications approved by the department upon completion of use or by the date specified in the approved forest practices application, whichever is earlier. Approaches to the crossing shall be water barred and stabilized at the time of the crossing removal. The department may waive removal of the water crossing if the applicant secures an amended forest practices application, and the structure and its approaches meet all of the requirements of a permanent water crossing structure.~~

~~(h) Temporary wetland crossings shall be abandoned and restored based on a written plan approved by the department prior to construction.~~

~~(i) Temporary water crossings must be designed to provide the same level of protection for public resources as provided by rules during the length of its use.~~

~~*(5) Properly prepared and maintained fords may be used in Type Np and Ns Waters during periods of low water.~~

~~(a) Entry and exit points for each ford must be located as close to perpendicular along the stream as possible, but will not exceed 100 feet upstream or downstream of each other. Approaches to the ford will not run adjacent to the stream.~~

~~(b) Ford locations must be shown on the forest practices application.~~

~~(c) Best management practices for construction, maintenance and use will be utilized as appropriate or as required by~~

~~conditions on the approved forest practices application.~~)) (7) Fords.

(a) New ford construction requires a forest practices application.

(b) The entry and exit points of a new ford must not be within one hundred feet upstream or downstream of another ford.

(c) The following activities associated with established fords require a forest practices application:

(i) Ford repair with equipment or construction work waterward of the bankfull width;

(ii) Driving a vehicle or operating equipment on or across wetted stream beds at areas other than established fords.

(d) Driving a vehicle or operating equipment on or across an established ford does not require a forest practices application.

(e) **"Established ford"** means a crossing place in a watercourse that was in existence and annually used prior to 1986 or subsequently permitted by the department, and has identifiable approaches on the banks.

NEW SECTION

WAC 222-24-041 *Water crossing structures in Type S and F Waters. (1) In Type S and F Waters, bridges are preferred as water crossing structures in order to ensure free and unimpeded fish passage for adult and juvenile fishes and preserve spawning and rearing habitat. Pier placement within bankfull width shall be avoided where practical. Other structures which may be approved include, in descending order of preference: Temporary culverts; bottomless arch culverts; arch culverts; round culverts; and fords. Corrugated culverts are generally preferred over smooth surfaced culverts. Culvert baffles and downstream control weirs are discouraged except to correct fish passage problems at existing structures.

(2) An approved forest practices application is required for construction, structural work, and maintenance associated with any bridge structure. Typical maintenance includes painting and other activities where there is potential for wastage of paint, sandblasting material, sediments, or bridge parts into the water, or where the work, including equipment operation, occurs within bankfull width of the stream.

(3) Water crossing structure projects shall incorporate mitigation measures as necessary to achieve no-net-loss of productive capacity of fish and shellfish habitat.

(4) **Bridge construction.**

(a) Excavation for and placement of the foundation and superstructure shall be outside the bankfull width unless the construction site is separated from the stream by use of an

approved dike, cofferdam, or similar structure.

(b) The bridge structure or stringers shall be placed in a manner to minimize damage to the bed.

(c) Alteration or disturbance of bank or bank vegetation shall be limited to that necessary to construct the project. All disturbed areas shall be protected from erosion within seven days of completion of the project, using vegetation or other means. The banks shall be revegetated with native or other approved woody species and maintained as necessary to ensure survival. See board manual section 5 for technical guidance.

(d) Removal of existing or temporary structures shall be accomplished so that the structure and associated material does not enter the stream.

(e) The bridge shall be constructed, according to the approved design, to pass the 100-year flood level and debris likely to be encountered. Exception shall be granted if applicant provides hydrologic or other information that supports alternative design criteria.

(f) Wastewater from project activities and water removed from within the work area shall be routed and deposited to the forest floor in an upland area to allow removal of fine sediment and other contaminants prior to being discharged to typed waters.

(g) Structures containing concrete shall be sufficiently cured prior to contact with water to avoid leaching.

(h) Abutments, piers, piling, sills, approach fills, etc., shall not constrict the flow so as to cause any appreciable increase (not to exceed 0.2 feet) in backwater elevation (calculated at the 100-year flood level) or channel wide scour and shall be aligned to cause the least effect on the hydraulics of the watercourse.

(i) Riprap materials used for structure protection shall be angular rock and the placement shall be installed according to an approved design to withstand the 100-year flood level.

(5) Temporary culvert installation. The allowable placement of temporary culverts and time limitations shall be determined by the department based on the specific fish resources of concern at the proposed location of the culvert. See board manual section 5 for guidance on temporary culvert installation.

(a) Where fish passage is a concern, temporary culverts shall be installed according to an approved design based on the definition of bankfull width for culvert design and construction in WAC 222-16-010, to provide adequate fish passage. In these cases, the temporary culvert installation shall meet the fish passage design criteria in Table 1 in subsection (6) of this section.

(b) Where culverts are left in place during the period of September 30th to June 15th, the culvert shall be designed to maintain structural integrity to the 100-year flood level with consideration of the debris loading likely to be encountered.

(c) Where culverts are left in place during the period June 16th to September 30th, the culvert shall be designed to maintain structural integrity at a peak flow expected during the entire period the culvert will be in place.

(d) Disturbance of the bed and banks shall be limited to that

necessary to place the culvert and any required channel modification associated with it. Affected bed and bank areas outside the culvert shall be restored to preproject condition following installation of the culvert.

(e) The culvert shall be installed in the dry, or in isolation from stream flow by the installation of a bypass flume or culvert, or by pumping the stream flow around the work area. Exception may be granted if siltation or turbidity is reduced by installing the culvert in the flowing stream. The bypass reach shall be limited to the minimum distance necessary to complete the project. Fish stranded in the bypass reach shall be safely removed to the flowing stream.

(f) Wastewater from project activities and dewatering shall be routed and deposited to the forest floor in an upland area to allow removal of fine sediment and other contaminants prior to being discharged to typed waters.

(g) Imported fill which will remain in the stream after culvert removal shall consist of clean rounded gravel ranging in size from one-quarter to three inches in diameter. The use of angular rock may be approved from June 16th to September 30th, where rounded rock is unavailable. Angular rock shall be removed from the watercourse and the site restored to preproject conditions upon removal of the temporary culvert.

(h) The culvert and fill shall be removed and the disturbed bed and bank areas shall be reshaped to preproject configuration. All disturbed areas shall be protected from erosion, within seven days of completion of the project, using vegetation or other means. The banks shall be revegetated with native or other approved woody species and maintained as necessary to ensure survival. See board manual section 5 for technical guidance.

(i) The temporary culvert shall be removed and the approaches shall be blocked to vehicular traffic prior to the expiration of the work window as conditioned for the specific hydraulic project in the forest practices application.

(j) Temporary culverts must be removed prior to the expiration of the forest practices application.

(6) **Permanent culvert installation.**

(a) In fish bearing waters or waters upstream of a fish passage barrier (which can reasonably be expected to be corrected, and if corrected, fish presence would be reestablished), culverts shall be designed and installed so as not to impede fish passage. Culverts shall only be approved for installation in spawning areas where full replacement of impacted habitat is provided by the applicant.

(b) To facilitate fish passage, culverts shall be designed based on bankfull width to the following standards:

(i) Culverts may be approved for placement in small streams if placed on a flat gradient with the bottom of the culvert placed below the level of the streambed a minimum of twenty percent of the culvert diameter for round culverts, or twenty percent of the vertical rise or structure height for elliptical culverts (this depth consideration does not apply within bottomless culverts). Footings of bottomless culverts shall be buried sufficiently deep

so they will not become exposed by scour within the culvert. The twenty percent placement below the streambed shall be measured at the culvert outlet. The culvert width at the bed, or footing width, shall be equal to or greater than the average width of the bed of the stream.

(ii) Where culvert placement is not feasible as described in (b)(i) of this subsection, the culvert design shall include the elements in (b)(ii)(A) through (E) of this subsection:

(A) Water depth at any location within culverts as installed and without a natural bed shall not be less than that identified in Table 1. The low flow design, to be used to determine the minimum depth of flow in the culvert, is the two-year seven-day low flow discharge for the subject basin or ninety-five percent exceedance flow for migration months of the fish species of concern. Where flow information is unavailable for the drainage in which the project will be conducted, calibrated flows from comparable gauged drainages may be used, or the depth may be determined using the installed no-flow condition.

(B) The high flow design discharge, used to determine maximum velocity in the culvert (see Table 1), is the flow that is not exceeded more than ten percent of the time during the months of adult fish migration. The two-year peak flood flow may be used where stream flow data are unavailable.

(C) The hydraulic drop is the abrupt drop in water surface measured at any point within or at the outlet of a culvert. The maximum hydraulic drop criteria must be satisfied at all flows between the low and high flow design criteria.

(D) The bottom of the culvert shall be placed below the natural channel grade a minimum of twenty percent of the culvert diameter for round culverts, or twenty percent of the vertical rise or structural height for elliptical culverts (this depth consideration does not apply within bottomless culverts). The downstream bed elevation, used for hydraulic calculations and culvert placement in relation to bed elevation, shall be taken at a point downstream at least four times the average width of the stream (this point need not exceed twenty-five feet from the downstream end of the culvert). The culvert capacity for flood design flow shall be determined by using the remaining capacity of the culvert.

Table 1
Fish Passage Design Criteria for Culvert Installation

Criteria	Adult Trout > 6 in. (150 mm)	Adult Pink, Chum Salmon	Adult Chinook, Coho, Sockeye, Steelhead
1. Velocity, Maximum (fps)			
Culvert Length (ft)			
a. 10 - 60	4.0	5.0	6.0
b. 60 - 100	4.0	4.0	5.0
c. 100 - 200	3.0	3.0	4.0
d. > 200	2.0	2.0	3.0

Criteria	Adult Trout > 6 in. (150 mm)	Adult Pink, Chum Salmon	Adult Chinook, Coho, Sockeye, Steelhead
2. Flow Depth Minimum (ft)	0.8	0.8	1.0
3. Hydraulic Drop, Maximum (ft)	0.8	0.8	1.0

(E) Appropriate statistical or hydraulic methods must be applied for the determination of flows in (b)(ii)(A) and (B) of this subsection. These design flow criteria may be modified for specific proposals as necessary to address unusual fish passage requirements, where other approved methods of empirical analysis are provided, or where the fish passage provisions of other special facilities are approved by the department.

(F) Culvert design shall include consideration of flood capacity for current conditions and future changes likely to be encountered within the stream channel, and debris and bedload passage.

(c) Culverts shall be installed according to an approved design to maintain structural integrity to the 100-year flood level with consideration of the debris loading likely to be encountered. Exception may be granted if the applicant provides justification for a different level or a design that routes the flow past the culvert without jeopardizing the culvert or associated fill.

(d) Disturbance of the bed and banks shall be limited to that necessary to place the culvert and any required channel modification associated with it. Affected bed and bank areas outside the culvert and associated fill shall be revegetated with native or other approved woody species and maintained as necessary to ensure survival. See board manual section 5 for technical guidance.

(e) Fill associated with the culvert installation shall be protected from erosion to the 100-year flood level.

(f) Culverts shall be designed and installed to avoid inlet scouring and shall be designed in a manner to prevent erosion of stream banks downstream of the project.

(g) Where fish passage criteria are required, the culvert facility shall be maintained by the landowner(s), such that fish passage design criteria in Table 1 are not exceeded. If the structure becomes a hindrance to fish passage, the landowner shall be responsible for obtaining an approved forest practices application and providing prompt repair.

(h) The culvert shall be installed in the dry or in isolation from the stream flow by the installation of a bypass flume or culvert, or by pumping the stream flow around the work area. Exception may be granted if siltation or turbidity is reduced by installing the culvert in the flowing stream. The bypass reach shall be limited to the minimum distance necessary to complete the project. Fish stranded in the bypass reach shall be safely removed to the flowing stream.

(i) Wastewater from project activities and dewatering shall be routed to the forest floor in an upland area as necessary to allow

removal of fine sediment and other contaminants prior to being discharged to any typed water or wetland.

(7) **Alternative designs** will be considered if they can be demonstrated to meet or exceed fish protection standards. Alternative designs may require additional review.

NEW SECTION

WAC 222-24-042 *Water crossing structures in Type Np and Ns Waters. *(1) **Bridges over Type Np and Ns Waters.** In addition to the applicable general provisions in WAC 222-24-040, the installation, maintenance, and removal of permanent bridges in or across Type Np and Ns Waters are subject to the following:

(a) Permanent bridges must not constrict clearly defined channels and must be designed and installed to pass the 100-year flood. The bridge and its associated embankments and fills must provide sufficient erosion protection to withstand a 100-year flood event.

(b) Excavation for and placement of the bridge foundation and superstructure must be located and conducted from outside the outer edge of the bankfull width. This requirement may be waived by the department if it can be demonstrated that these activities may be conducted in such a manner to prevent damage to public resources.

(c) Earthen embankments constructed for use as bridge approaches must be provided with sufficient erosion protection to withstand a 100-year flood event.

*(2) **Culvert installation for Type Np and Ns Waters.** In addition to applicable general provisions in WAC 222-24-040, the installation, maintenance and removal of permanent culverts in or across Type Np and Ns Waters are subject to the following provisions:

(a) All permanent culverts must be designed to pass the 100-year flood event with consideration for the passage of debris likely to be encountered.

(b) The culvert and its associated embankments and fills must have sufficient erosion protection to withstand the 100-year flood event. Erosion protection may include armored overflows or the use of clean coarse fill material.

(c) If the department determines that because of unstable slopes the culvert size shown in board manual section 5, "Determining Culvert Size, Method A" would be inadequate to protect public resources, it may require a larger culvert designed using generally accepted engineering principles that meet the standards in (a) and (b) of this subsection.

(d) No permanent culverts shall be installed that are smaller than:

(i) Twenty-four inches for Type Np Waters;

(ii) Eighteen inches for Type Ns Waters in western Washington;

and

(iii) Fifteen inches for Type Ns Waters in eastern Washington.

(e) The alignment and slope of the culvert shall parallel the natural flow of the stream whenever possible.

(f) Culverts must be designed and installed so they will not cause scouring of the stream bed and erosion of the banks in the vicinity of the project.

(g) When the department determines that installing a culvert in a flowing stream will result in excessive siltation and turbidity, and siltation and turbidity would be reduced if stream flow were diverted, the department shall require the stream flow be diverted using a bypass flume or culvert, or by pumping the stream flow around the work area. This may include culvert installations that are within 0.25 miles of a Type S or F Water or within two miles of a hatchery intake in consultation with the department of fish and wildlife.

(h) Fill associated with culvert installation must have sufficient erosion protection to withstand the 100-year flood event.

(i) Stream beds shall be cleared for a distance of fifty feet upstream from the culvert inlet of such slash or debris that reasonably may be expected to plug the culvert.

(j) The entrance of all culverts shall have adequate headwalls constructed to minimize the possibility of erosion or fill failure.

*(3) **Temporary water crossings in Type Np and Ns Waters**. In addition to the applicable general provisions above, installation, maintenance and removal of temporary bridges or other structures in or across Type Np and Ns Waters are subject to the following:

(a) A temporary water crossing is intended for use during the life of an approved application/notification.

(b) It must be constructed to facilitate abandonment when the intended use is complete or upon seasonal shutdown, whichever is sooner.

(c) Temporary water crossings must be identified on the forest practices application or notification, along with an abandonment date.

(d) Temporary water crossings may be used:

(i) In western Washington if installed after June 1st and removed by September 30th of the same year.

(ii) In eastern Washington if installed after the spring runoff and removed prior to October 15th.

(iii) At other times, when the department and applicant can agree to specific dates of installation and removal and the extended dates result in equivalent levels of resource protection.

(e) Temporary water crossings must be designed to pass the highest peak flow event expected to occur during the length of its intended use.

(f) When the department determines that installing a culvert in a flowing stream will result in excessive siltation and turbidity, and siltation and turbidity would be reduced if stream flow were diverted, the department shall require the stream flow be diverted using a bypass flume or culvert, or by pumping the stream flow around the work area. This may include culvert installations

that are within 0.25 miles of a Type S or F Water or within two miles of a hatchery intake.

(g) Temporary water crossings shall be promptly removed and abandoned to the specifications approved by the department upon completion of use or by the date specified in the approved forest practices application, whichever is earlier. Approaches to the crossing shall be water barred and stabilized at the time of the crossing removal. The department may waive removal of the water crossing if the applicant secures an amended forest practices application, and the structure and its approaches meet all of the requirements of a permanent water crossing structure.

(h) Temporary wetland crossings shall be abandoned and restored based on a written plan approved by the department prior to construction.

(i) Temporary water crossings must be designed to provide the same level of protection for public resources as provided by rules during the length of its use.

NEW SECTION

WAC 222-24-044 *Temporary bypass culverts, flumes, or channels. Temporary bypass culvert, flume, or channel projects shall incorporate mitigation measures as necessary to achieve no-net-loss of productive capacity of fish and shellfish habitat. The following shall apply to temporary bypass culvert, flume, or channel projects:

(1) The temporary bypass culvert, flume, or channel shall be in place prior to initiation of other work in the wetted perimeter.

(2) A sandbag revetment or similar device shall be installed at the inlet to divert the entire flow through the culvert, flume, or channel.

(3) A sandbag revetment or similar device shall be installed at the downstream end of the culvert, flume, or channel to prevent backwater from entering the work area.

(4) The culvert, flume, or channel shall be of sufficient size to pass flows and debris for the duration of the project.

(5) For diversion of flow into a temporary channel the relevant provisions of WAC 222-110-080, channel change/realignment, shall apply.

(6) Prior to releasing the water flow to the project area, all bank protection or armoring shall be completed. See board manual section 5 for project site preparation best management practices.

(7) Upon completion of the project, all material used in the temporary bypass shall be removed from the site and the site returned to preproject conditions.

(8) The department may require fish capture and safe transport from the project site to the nearest free-flowing water if fish could be adversely impacted as a result of the project. The

department of fish and wildlife may assist in capturing and safely removing fish to free-flowing water if personnel are available.

(9) Alteration or disturbance of the banks and bank vegetation shall be limited to that necessary to construct the project. All disturbed areas shall be protected from erosion within seven days of completion of the project using vegetation or other means. The banks shall be revegetated with native or other approved woody species and maintained as necessary to ensure survival. See board manual section 5 for technical guidance.

NEW SECTION

WAC 222-24-046 *Bank protection. Bio-engineering is the preferred method of bank protection where practical. Bank protection projects shall incorporate mitigation measures as necessary to achieve no-net-loss of productive capacity of fish and shellfish habitat. The following shall apply to bank protection projects:

(1) Bank protection work shall be restricted to work necessary to protect eroding banks.

(2) Bank protection material placement waterward of the bankfull width shall be restricted to the minimum amount necessary to protect the toe of the bank, or for installation of mitigation features approved by the department.

(3) The toe shall be designed to protect the integrity of bank protection material.

(4) Bank sloping shall be accomplished in a manner that avoids release of overburden material into the water. Overburden material resulting from the project shall be deposited so as not to reenter the water.

(5) Alteration or disturbance of the bank and bank vegetation shall be limited to that necessary to construct the project. All disturbed areas shall be protected from erosion within seven days of completion of the project using vegetation or other means. The banks, including riprap areas, shall be revegetated with native or other approved woody species and maintained to ensure survival. See board manual section 5 for technical guidance.

(6) Fish habitat components such as logs, stumps, and/or large boulders may be required as part of the bank protection project to mitigate project impacts. These fish habitat components shall be installed according to an approved design to withstand 100-year peak flows.

(7) When rock or other hard materials are approved for bank protection, the following provisions shall apply:

(a) Bank protection material shall be angular rock. The project shall be designed and the rock installed to withstand 100-year peak flows. River gravels shall not be used as exterior armor, except as specifically approved by the department.

(b) Bank protection and filter blanket material shall be

placed from the bank or a barge. Dumping onto the bank face shall be permitted only if the toe is established and the material can be confined to the bank face.

AMENDATORY SECTION (Amending WSR 06-11-112, filed 5/18/06, effective 6/18/06)

WAC 222-24-0511 *Small forest landowner road maintenance planning. (1) Small forest landowners who own a total of eighty acres or less forest land in Washington state are not required to submit any road maintenance and abandonment plan for any block of forest land that contains twenty contiguous acres or less.

(2) Small forest landowners other than those described in subsection (1) of this section, are only required to submit a checklist road maintenance and abandonment plan when they submit a forest practices application or notification that includes timber harvest or salvage. The checklist must include all their forest roads that are used for the forest practice. Instead of a checklist, landowners may submit a road maintenance and abandonment plan as described in WAC 222-24-051 with the following modifications:

- They are not required to submit an annual report.
- If they participate in the family forest fish passage program, they may schedule their barrier projects accordingly.

(3) Forest roads must be maintained only to the extent necessary to prevent damage to public resources.

*(4) If the department determines that a road will cause or has the potential to cause damage to a public resource, the department may require the applicant to submit a compliance schedule of work to fix the problem(s) identified by the department.

(5) Fish passage barriers will be assessed on a watershed basis focusing on fixing the worst barriers first.

(a) The department's family forest fish passage program is available to assist with the removal, replacement, or repair of fish passage barriers that were installed prior to May 14, 2003. The program includes limits on landowner costs and the opportunity for in-kind contributions. One hundred percent public funding shall be provided if an existing barrier was installed under an approved forest practices application((~~, and~~)) or a hydraulics project approval acquired prior to December 31, 2013, and that barrier becomes a high priority for replacement.

(b) Small forest landowners who participate in the family forest fish passage program are not required to remove, replace or repair barriers until cost share funding is available and higher priority barriers on lands within the watershed have been removed or funded. Small forest landowners participating in the program may make use of prioritization without any obligations to receive

funding from the program.