



Western Washington Overstocked Stand

General Description:

These stands contain high tree densities usually containing more than 300 trees per acre, and contain at least a 70 percent canopy closure. There are many dead limbs in the lower portion of the canopy and limited understory vegetation is present. Stands in this condition contain the least amount of diversity or wildlife habitat potential. Without thinning, the canopy will completely close, causing the trees to compete for resources, slowing the overall growth of the trees, and increasing tree mortality.

Steps:

1. Complete Alternate Plan (AP)
2. Complete Forest Practices Application (FPA)
3. Submit AP and FPA to local region office
4. Meet on-site with Forest Practices (FP) Forester
5. FP Forester issues decision/conditions

Forms:

- [Alternate Plan](#)
- [Forest Practices Application](#)

Other Links:

- [WAC 222-12-040](#)
- [Forest Practice Board Manual \(Section 21\)](#)

Key Components to Address to Maintain Riparian Function

Riparian Core Zone

Protect the riparian core zone! For Western Washington this means the 50 foot buffer of a Type S or F Water, measured horizontally from the outer edge of the bankfull width or the outer edge of the channel migration zone, whichever is greater.

Sediment Filtering

Riparian vegetation helps to filter sediment, reduce the likelihood of landslide events, and regulate the natural erosion process in the riparian area. Mulch, hay, or strategic water control structures may be necessary due to the lack of understory vegetation.

Live and downed dead trees left in the RMZ will continue to provide some slowing of runoff and filtering of sediment. Leave tops and branches scattered within RMZ if possible.

Measures may be considered to reduce erosion and increase sediment filtration where slopes are greater than 35 percent: placing of tree tops and slash, grass seeding or mulching, water barring, and limiting disturbance.

Stream Bank Stability

Maintaining stable stream banks will allow channel structures to develop naturally. Maintaining stream bank vegetation is vital to maintaining stable stream banks. All live trees that are directly providing bank stability by their root structure must remain. Dead trees *may* be taken provided no additional bank instability is created by their cutting or removal.

Leaf Litter Fall / Nutrients

Organic input from riparian vegetation influences water quality and provides an important food source for aquatic organisms. This function is best provided where live trees remain near the stream channel. Post-harvest trees will continue to expand their canopy, ultimately increasing long term leaf litter contribution.

Large Woody Debris

Large woody debris provides important habitat diversity by providing structure for stabilizing streambeds, building floodplains, storing sediment, and providing habitat for fish and amphibians. Leave dead trees leaning toward the stream or with a high likelihood to recruit to the stream, especially within the 30 foot core zone (consult Dept. of Labor & Industries regarding worker safety guidelines). Where large wood is lacking in a stream channel, a large woody debris placement strategy will increase the recovery rate. Consultation with Washington Department of Fish and Wildlife is required.

Shade

Shade from the canopy of the adjacent riparian area vegetation is the most significant influence on stream temperature. Shade provides cool stream temperatures which is a vital riparian function for fish and amphibians. Short and long term shade from the overstory should continue to supply adequate temperature control.

Other Components to Address

Wildlife Habitat

Plan for wildlife trees - Dead, dying and live defective trees are an important part of a healthy forest. Trees can actually provide more habitat for wildlife dead than when they are alive. Standing dead and dying trees, called “snags” or “wildlife trees,” are important for wildlife and occur as a result of disease, lightning, fire, animal damage, too much shade, drought, root competition, as well as old age.

Birds, small mammals, and other wildlife use snags for nests, nurseries, storage areas, foraging, roosting, and perching. Live trees with snag-like features, such as hollow trunks, excavated cavities, and dead branches can provide similar wildlife value. Snags occurring along streams and shorelines eventually may fall into the water, adding important woody debris to aquatic habitat. Dead branches are often used as perches; snags that lack limbs are often more decayed and may have more and larger cavities for shelter and nesting. Snags attract wildlife species that may not otherwise be found there.

All trees of all sizes are potential snags. Unfortunately, many wildlife trees are cut down without much thought to their wildlife value or of the potential management options that can safely prolong the existence of the tree. Wildlife trees offer a one-stop, natural habitat feature.

Slash

Conduct good slash management practices to decrease or limit the risk of insects, disease, or fire to neighboring stands. Large accumulations of slash may contribute to initiation or exacerbation of mass wasting events (e.g., debris slides, and debris torrents); however, these events are expected to be rare because current forest practices rules prohibit the machine piling of slash and debris within 30 feet of unbuffered streams. Likewise, limbing and bucking within the bankfull channel of Type S, F, and Np waters, RMZ cores, sensitive sites, or open water areas of Type A wetlands is prohibited.

Equipment Limitation Zone

Maintain a 30-foot wide Equipment Limitation Zone measured horizontally from the outer edge of the bankfull width of a Type Np or Ns Water. This applies to all perennial and seasonal non-fish bearing streams. Where the risk of erosion is very high, additional width should be considered.

Stocking

Ensure proper stocking and diversity of site appropriate tree species (resistant to ongoing insect and disease mortality within the area). Utilize harvest methods that will restore natural forest structure and diversity.

Template 1. Small Forest Landowner Western Washington Thinning Strategies for Overstocked Conifer-Dominated Riparian Management Zones

This template provides specific steps to take to address overstocked stands in western Washington.

BACKGROUND

With the 2001 Forest Practices rules, riparian management zones (RMZ) on forested streams became wider and required more leave trees than previously required under the forest practices rules.

Reforestation from previous forest management activities, and in some cases natural stocking levels, has resulted in high tree densities of conifer species within riparian areas. These managed stands were densely planted with the intent to commercially thin, to promote growth of superior trees and to generate income to the small forest landowner. Without thinning, the canopies of these stands will begin to close, causing the trees to compete for resources, slowing the overall growth of the plantation, and increasing tree mortality.

PURPOSE

The purpose of this overstocked stand template is to increase riparian function on stands that have or will show signs of suppressed growth, and to increase the economic viability of the small forest landowner in these situations. Through commercial thinning, these stands can be managed in a manner that will establish understory vegetation and achieve larger tree diameters of the residual stands faster than would have occurred under a no thinning option.

This template provides flexibility for small forest landowners to harvest while protecting riparian functions. The harvest strategies for this template includes a no harvest zone and a thinning zone that meets or exceeds the stand requirements to achieve the goal in WAC 222-30-010(2): ". . . to protect aquatic resources and related habitat to achieve restoration of riparian function; and the maintenance of these resources once they are restored."

PROCESS

Adherence to all of the strategies within this template will meet the riparian function requirements for the approval of an alternate plan as described in WAC 222-12-0401(6): "An alternate plan must provide protection for public resources at least equal in overall effectiveness to the protection provided in the act and rules." An alternate plan must include the template form, available through the DNR. The form must be included with the forest practices application. This form provides the technical justification as required in WAC 222-12-0401(3)(b), (c), and (d), identifying how the alternate plan addresses the various functional requirements of the RMZ.

QUALIFYING STANDS

Qualifying stands are stands with at least 70% conifer with a canopy that is closing, having a minimum of 300 trees per acre (TPA) at the time of stand initiation and located within an RMZ adjacent to Type S, F or Np waters. Landowners planning to thin a qualifying stand within an RMZ protected by the Shoreline Management Act (RCW 76.09.910) must consult with the county of jurisdiction and include written documentation from the county stating that the operation complies with the Shoreline Management Act. This documentation must be included with the forest practices application.

RIPARIAN MANAGEMENT ZONES

This template differs from standard rules by:

- Allowing thinning of conifer within RMZs for Type S, F, and Np Waters; and
- Requiring an RMZ for the entire length of the Type Np Water length, not just 50% of the length.

The total RMZ widths of Type S, F, and Np Waters are the same as in standard rules. The template separates the RMZ into three management zones (no harvest, thinning, and outer) for Type S and F Waters, and two management zones (no harvest and thinning) for Type Np Waters.

RMZ widths are measured horizontally from the outer edge of bankfull width (BFW) or the channel migration zone (CMZ) on Type S and F Waters or the outer edge of BFW on Type Np Waters (see Board Manual Section 2).

Harvest Prescriptions

Type S and F Water Thinning Strategy

No Harvest Zone: The width of the no harvest zone is measured horizontally from the outer edge of BFW or the CMZ and is determined according to the following criteria:

- A distance equal to 1/2 the average crown diameter of the dominant conifer trees closest to the edge of the BFW or CMZ. To determine this distance, measure the crown diameters of at least 10 dominant conifer trees within 30 feet of BFW or CMZ.
- The no harvest zone must include all conifer trees within the first row nearest the outer edge of BFW or the CMZ.
- The no harvest zone must be between 14 and 30 feet from BFW or CMZ.
- Measured trees cannot be harvested to allow for compliance and monitoring. Each tree must be marked and numbered.

Thinning Zone: The thinning zone is measured from the outer edge of the no harvest zone. The combined distance of the no harvest and thinning zone, as measured from the outer edge of BFW or CMZ, can be no less than 75 feet. To determine the total widths of the no harvest and thinning zone use the following table.

<i>Site Class</i>	Combined Widths of No Harvest and Thinning Zones (Measured from the outer edge of bankfull width or channel migration zone)	
	Stream BFW width \leq 10 feet	Stream BFW width $>$ 10 feet
I	133 feet	150 feet
II	113 feet	128 feet
III	93 feet	105 feet
IV	75 feet	83 feet
V	75 feet	75 feet

The harvesting strategies for the thinning zone are:

- Maintain a minimum of 100 conifer trees per acre post harvest with a maximum harvest of 65% of the trees cut in any one entry. The shade requirements must be met

within 75 feet of the stream, as described in WAC 222-30-040 and Board Manual Section 1;

- Thin from below, where at the end of harvest the average stand diameter will be larger than the average stand diameter before harvest. The guideline for this is $d/D < 1$.
- Follow the Large Woody Debris Placement Strategy (see below) when the thinning

To determine $d/D < 1$, first calculate the quadratic mean diameter of the trees to be cut (d), next calculate the quadratic mean diameter of the stand prior to thinning (D), then compare the ratio of d/D to assure the value is less than one.

results in a stand less than 180 trees per acre.

- Thinning must not result in a stand with fewer than 100 well-distributed conifer trees per acre.
- Maintain an Equipment Limitation Zone (ELZ) of 30 feet, as measured from the outer edge of BFW or CMZ.
- Soil disturbance within the ELZ cannot result in sediment delivery to the stream.
- Suspend one end of the log during yarding within the ELZ. Use directional falling away from the stream to minimize stream bank disturbance. In the thinning zone, use ground-based yarding systems only on slopes less than 35%.
- On slopes greater than 35% fully suspend all trees yarded through the thinning zone.

Outer Zone: Harvest according to the outer zone rule outlined in WAC 222-30-021(1)(c).

Type Np Waters Thinning Strategy

One of two harvesting practices can be applied along Type Np Waters, but not both in any one harvest entry. The standard RMZ buffer as outlined in WAC 222-30-021(2) may be applied or the thinning strategy as described below may be applied.

Establish a 50-foot RMZ for the total length of the Type Np Water. Within this RMZ, establish a no harvest zone and a thinning zone.

No Harvest Zone: Measure the width of the no harvest zone horizontally from the outer edge of bankfull width according to the following criteria:

- A distance equal to $1/2$ the average crown diameter of the dominant conifer trees closest to the edge of BFW. To determine this distance, measure the crown diameters of a minimum of 10 dominant conifer trees within 30 feet of BFW.
- The no harvest zone must include all conifer trees within the first row nearest the outer edge of BFW.
- The no harvest zone must be between 14 feet and 30 feet in width.
- No allowable harvesting of measured trees. Each tree must be marked and numbered.

Harvesting must not occur within any sensitive site buffers. Sensitive sites include the 56-foot radius buffer patch centered on the point of intersection of two or more Type Np Waters, headwall seeps, sidewall seeps, headwater springs or the points at the upper most extent of Type Np Waters, or within alluvial fans. See WAC 222-30-021(2)(b)(i) through (vi).

Thinning Zone: The harvesting strategies for the thinning zone are:

- Maintain a minimum of 100 conifer trees per acre with a maximum harvest of 65% of the trees cut in any one entry.
- Thin from below, where at the end of harvest the average stand diameter will be larger than the average stand diameter before harvest. The guideline for this is $d/D < 1$.

To determine $d/D < 1$, first calculate the quadratic mean diameter of the trees to be cut (d), next calculate the quadratic mean diameter of the stand prior to thinning (D), then compare the ratio of d/D to assure the value is less than one.

- Follow the Large Woody Debris Placement Strategy (see below) when the thinning results in a stand less than 180 trees per acre.
- Maintain at least 100 well-distributed conifer trees per acre after thinning.
- Maintain an ELZ of 30 feet, as measured from the outer edge of BFW during all harvest activities.
- Soil disturbance within the ELZ must not result in sediment delivery to the stream.
- Suspend one end of the log during yarding within the ELZ. Use directional falling away from the stream
- to minimize stream bank disturbance. In the thinning zone, use ground-based yarding systems only on slopes less than 35%.
- All trees yarded through the thinning zone using cable thinning on slopes greater than 35% must be fully suspended.

LARGE WOODY DEBRIS PLACEMENT STRATEGY

Ecological functions associated with large woody debris (LWD) are an important part of productive in-stream habitat. While riparian forests mature, certain management techniques in these areas can help tree-growing conditions to achieve the overall objective of growing larger diameter trees to contribute to long term riparian and in-stream habitat function. However, if thinning results in a residual stand below 180 TPA, the addition of LWD into streams is required except when WDFW has granted a wood placement exemption. The LWD placement is intended to substitute for wood harvested under this template that otherwise had the potential to recruit to the stream. This strategy is intended to provide woody debris to the stream in the short term (< 50 years) until the remaining unharvested trees within the RMZ are available to naturally recruit to the stream over the long term (> 50 years). The LWD placement strategy is intended to encourage instream pool formation for fish habitat. However, woody debris placement should not create barriers to fish migration.

LARGE WOODY DEBRIS PLACEMENT TARGET

Depending on site conditions, this strategy may require the placement of up to 4 pieces of LWD per 300 lineal feet of stream (approximately 4 pieces per acre of RMZ).

Small forest landowners are encouraged to consult with the small forest landowner office for technical assistance in identifying the preferred locations for LWD placement. Among those sites that are appropriate, different restrictions or levels of consultation may be necessary.

Technical staff can determine whether it is appropriate to place wood in the stream (taking into account stream size, sediment delivery concerns, etc.), help locate the most effective stream reaches for the placement of LWD, or determine if there is any need for additional LWD to be placed into the stream. At a minimum, the following locations should be avoided:

- Channels that have a history of debris torrents and/or other mass wasting activity.
- Channels that have a near-future likelihood of a debris torrent and/or other mass wasting activity.
- Locations immediately above permanent culverts.
- Confined channels where the valley floor width is less than twice the bankfull width (see Board Manual Section 2 for identifying CMZs and bankfull channel features).

Large Woody Debris Guidelines

The small forest landowner shall follow these guidelines for LWD placement:

The priority for LWD placement, from high to low preference, is:

- (a) Root wads with tree boles attached.
- (b) Tree boles with no root wad.
- (c) Root wads without tree boles attached.
- (d) Larger diameter wood is preferred over smaller diameter wood. However, LWD should be representative of the trees removed from the riparian stand.
- (e) Landowners are encouraged to leave limbs and branches attached to logs that are placed.
- (f) Trees may be felled directly into the stream.
- (g) Larger diameter wood is preferred over smaller diameter wood. However, LWD should be representative of the trees removed from the riparian stand.
- (h) Landowners are encouraged to leave limbs and branches attached to logs that are placed.
- (i) Trees may be felled directly into the stream.
- (j) Trees may be bucked, and the bucked pieces may be placed in the stream.
- (k) It is recommended that the boles of trees or rootwads be placed such that they are partially in the water and partially on the bank.
- (l) Large woody debris should be placed so that part of it is in the water at low summer stream flows as well as during high stream flows, to create pools and cover for fish.
- (m) The wood should not be held in place by anchoring or cabling.
- (n) No bank excavation should occur during wood placement.
- (o) The placement of LWD will likely need to occur when the local fish spawning populations are absent. This typically occurs during summer and fall low water flow periods.

Type of Wood and Wood Quality

For this template, LWD is the available wood found on the property of a small forest landowner. The landowner may utilize any living or dead trees for LWD except those required

to provide a live root mass to maintain bank stability. The first row of living trees adjacent to the edge of BFW or the CMZ provides bank stability to the stream. Do not use these trees as LWD. Acceptable wood for LWD consists of:

- Conifer trees or logs, such as cedar, Douglas-fir, or hemlock. These are the preferred species for LWD placement because they will remain (i.e., decay slower) and will provide woody debris over a longer period. Hardwood or pine species should be avoided.
- Logs from trees felled at time of harvest or downed logs with a solid core. If logs are from an upland source, they must not include downed log requirements for wildlife as described in WAC 222-30-020(11). Downed logs and standing snags already within the RMZ should be retained for wildlife habitat, floodplain function, and stand regeneration rather than moved into the channel.
- Trees, including root wads, harvested during road construction are a good source of LWD.

Minimum Wood Length

The length of logs placed in the stream should be at least two times the bankfull width of the stream. If the log has a root wad attached, the log length should be no less than 1.5 times the bankfull width of the stream. The SFLO, in consultation with the WDFW or a tribal representative, shall determine if shorter wood lengths are acceptable.

Minimum Wood Diameter

The placement of large diameter woody debris is encouraged if it is available. However, LWD should be representative of the trees removed from the riparian stand. At a minimum, a piece of LWD measured at the small end must be at least 4 inches in diameter.

This strategy does not require the placement of large dimensional wood into the stream, but placement of large wood is encouraged if it is available. While it is recognized that most trees harvested under this template will not be greater than 22 inches diameter breast height (dbh), the landowner may place LWD obtained from off site. The table below from Board Manual Section 26 gives guidance for optimal LWD piece size in different sized streams.

BFW (in feet)	Minimum Diameter
< 5 feet	12 inches
> 5 and < 16 feet	16 inches
> 16 and < 32 feet	22 inches
> 32 feet	26 inches

RESTRICTIONS TO RIPARIAN ZONE DISTURBANCES

Minimize ground disturbance from machinery to reduce sediment delivery to a stream. Disturbed soils with the potential to erode and directly deliver to the stream shall be treated with erosion control measures available and appropriate for the site. Appropriate control measures may include water bars, grass seeding, mulching, hay bales or silt fences.

The ELZ is 30 feet, measured horizontally, from the outer edge of the BFW (see Board Manual Section 2). Equipment may operate within this zone, but soil disturbance within the ELZ from ground based equipment or cable-logging systems must not result in sediment

delivery to the stream. If LWD placement activities could expose more than 10% of the soil in the ELZ, there is potential for sediment delivery to the stream and the landowner must consult with a DNR Forest Practices forester before placement.

SUMMARY

Applying this template will allow small forest landowners to submit an alternate plan for a Western Washington overstocked conifer thinning prescription as part of a completed forest practices application (FPA). The FPA will be processed as an alternate plan as outlined in WAC 222-12-0401. The template form must be included with the forest practices application, and is available through DNR. This form provides the technical justifications, as required in WAC 222-12-0401(3)(b), (c), and (d), identifying how the alternate plan addresses the various functional requirements of the RMZ. Review of the proposed harvest may require an Interdisciplinary (ID) Team (see WAC 222-12-0401(5)). However, by adhering to the guidelines in this template, the need for an ID Team will be minimal and only necessary if specific issues arise.

Questions? [Click here to find your DNR Region contact information.](#)